

Tennessee Valley Authority  
Form 10-K  
November 15, 2017  
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UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549  
FORM 10-K

(MARK ONE)

ANNUAL REPORT PURSUANT TO  
SECTION 13, 15(d), OR 37 OF THE SECURITIES EXCHANGE ACT OF 1934  
For the fiscal year ended September 30, 2017

OR  
 TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF  
1934

For the transition period from \_\_\_\_\_ to \_\_\_\_\_

Commission file number 000-52313

TENNESSEE VALLEY AUTHORITY

(Exact name of registrant as specified in its charter)

A corporate agency of the United States

created by an act of Congress 62-0474417

(State or other jurisdiction of  
incorporation or organization) (IRS Employer Identification No.)

400 W. Summit Hill Drive

Knoxville, Tennessee

(Address of principal executive offices) 37902 (Zip Code)

(865) 632-2101

(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act: None

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13, 15(d), or 37 of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes  No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files).

Yes  No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

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Large accelerated filer  Accelerated filer   
Non-accelerated filer  (Do not check if a smaller reporting company) Smaller reporting company   
Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).  
Yes  No

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GLOSSARY OF COMMON ACRONYMS

Following are definitions of some of the terms or acronyms that may be used in this Annual Report on Form 10-K for the fiscal year ended September 30, 2017 (the “Annual Report”):

Term or Acronym	Definition
AFUDC	Allowance for funds used during construction
AOCI	Accumulated other comprehensive income (loss)
ARO	Asset retirement obligation
ART	Asset Retirement Trust
ASLB	Atomic Safety and Licensing Board
BLEU	Blended low-enriched uranium
Bonds	Bonds, notes, or other evidences of indebtedness
BSER	Best system of emission reduction
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CCR	Coal combustion residuals
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CME	Chicago Mercantile Exchange
CO <sub>2</sub>	Carbon dioxide
COL	Combined construction and operating license application
COLA	Cost-of-living adjustment
CSAPR	Cross-State Air Pollution Rule
CTs	Combustion turbine unit(s)
CVA	Credit valuation adjustment
CY	Calendar year
DCP	Deferred Compensation Plan
DER	Distributed Energy Resources
DOE	Department of Energy
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
ERS	EnergyRight® Solutions programs
ESPA	Early Site Permit Application
FASB	Financial Accounting Standards Board
FCM	Futures Commission Merchant
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
FTP	Financial Trading Program
GAAP	Accounting principles generally accepted in the United States of America
GHG	Greenhouse gas
GP	Generation Partners
GPP	Green Power Providers
GPS	Green Power Switch®
GWh	Gigawatt hour(s)
IRP	Integrated Resource Plan
IRUs	Indefeasible rights of use
JSCCG	John Sevier Combined Cycle Generation LLC
kW	Kilowatts
kWh	Kilowatt hour(s)

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LPC	Local power company customer of TVA
LTDCP	Long-Term Deferred Compensation Plan
MATS	Mercury and Air Toxics Standards
MD&A	Management's Discussion and Analysis of Financial Condition and Results of Operations
MLGW	Memphis Light, Gas and Water Division
MLPs	Master Limited Partnerships
mmBtu	Million British thermal unit(s)
MOX	Mixed oxide
MtM	Mark-to-market



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MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NAV	Net asset value
NDT	Nuclear Decommissioning Trust
NEIL	Nuclear Electric Insurance Limited
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NES	Nashville Electric Service
NO <sub>2</sub>	Nitrogen dioxide
NO <sub>x</sub>	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NSR	New Source Review
NYSE	New York Stock Exchange
OCI	Other comprehensive income (loss)
OMB	Office of Management and Budget
PARRS	Putable Automatic Rate Reset Securities
PM	Particulate matter
QER	Quadrennial Energy Review
QTE	Qualified technological equipment and software
RECs	Renewable Energy Certificates
REIT	Real Estate Investment Trust
RSO	Renewable Standard Offer
SCCG	Southaven Combined Cycle Generation LLC
SCRs	Selective catalytic reduction systems
SEC	Securities and Exchange Commission
SERP	Supplemental Executive Retirement Plan
SHLLC	Southaven Holdco LLC
SMR	Small modular reactor(s)
SO <sub>2</sub>	Sulfur dioxide
SOA	Society of Actuaries
SSSL	Seven States Southaven, LLC
TCWN	Tennessee Clean Water Network
TDEC	Tennessee Department of Environment & Conservation
TIPS	Treasury Inflation-Protected Securities
TOU	Time-of-use
TVA Act	The Tennessee Valley Authority Act of 1933, as amended, 16 U.S.C. §§ 831-831ee
TVARS	Tennessee Valley Authority Retirement System
U.S. Treasury	United States Department of the Treasury
USACE	U.S. Army Corps of Engineers
VIE	Variable interest entity
XBRL	eXtensible Business Reporting Language



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FORWARD-LOOKING INFORMATION

This Annual Report on Form 10-K ("Annual Report") contains forward-looking statements relating to future events and future performance. All statements other than those that are purely historical may be forward-looking statements. In certain cases, forward-looking statements can be identified by the use of words such as "may," "will," "should," "expect," "anticipate," "believe," "intend," "project," "plan," "predict," "assume," "forecast," "estimate," "objective," "possible," "probably," "likely," "potential," "speculate," the negative of such words, or other similar expressions.

Although the Tennessee Valley Authority ("TVA") believes that the assumptions underlying the forward-looking statements are reasonable, TVA does not guarantee the accuracy of these statements. Numerous factors could cause actual results to differ materially from those in the forward-looking statements. These factors include, among other things:

- New, amended, or existing laws, regulations, or administrative orders, including those related to environmental matters, and the costs of complying with these laws, regulations, or administrative orders;
- The cost of complying with known, anticipated, or new emissions reduction requirements, some of which could render continued operation of many of TVA's aging coal-fired generation units not cost-effective and result in their removal from service, perhaps permanently;
  - Significant reductions in demand for electricity produced through non-renewable or centrally located generation sources which may result from, among other things, economic downturns, increased energy efficiency and conservation, increased utilization of distributed generation and microgrids, and improvements in alternative generation and energy storage technologies;
- Changes in customer preferences for energy produced from cleaner generation sources;
- Changes in technology;
- Actions taken, or inaction, by the U.S. government relating to the national debt ceiling or automatic spending cuts in government programs;
- Costs and liabilities that are not anticipated in TVA's financial statements for third-party claims, natural resource damages, environmental clean-up activities, or fines or penalties associated with unexpected events such as failures of a facility or infrastructure;
- Addition or loss of customers by TVA or the local power company customers of TVA ("LPCs");
- Significant delays, cost increases, or cost overruns associated with the construction and maintenance of generation, transmission, navigation, flood control, or related assets;
- Changes in the timing or amount of pension and health care obligations and related funding;
- Increases in TVA's financial liabilities for decommissioning its nuclear facilities or retiring other assets;
- Risks associated with the operation of nuclear facilities or coal combustion residual ("CCR") facilities;
- Physical attacks on TVA's assets;
- Cyber attacks on TVA's assets or the assets of third parties upon which TVA relies;
- The outcome of legal or administrative proceedings, including the CCR proceedings involving the Gallatin Fossil Plant as well as any other CCR proceedings that may be brought in the future;
- The failure of TVA's generation, transmission, navigation, flood control, and related assets and infrastructure, including CCR facilities, to operate as anticipated, resulting in lost revenues, damages, and other costs that are not reflected in TVA's financial statements or projections;
  - Differences between estimates of revenues and expenses and actual revenues earned and expenses incurred;
- Weather conditions;
  - Catastrophic events such as fires, earthquakes, explosions, solar events, electromagnetic pulses, geomagnetic disturbances, droughts, floods, hurricanes, tornadoes, pandemics, wars, national emergencies, terrorist activities, and other similar events, especially if these events occur in or near TVA's service area;

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Events at a TVA facility, which, among other things, could result in loss of life, damage to the environment, damage to or loss of the facility, and damage to the property of others;

Events or changes involving transmission lines, dams, and other facilities not operated by TVA, including those that affect the reliability of the interstate transmission grid of which TVA's transmission system is a part and those that increase flows across TVA's transmission grid;

Disruption of fuel supplies, which may result from, among other things, economic conditions, weather conditions, production or transportation difficulties, labor challenges, or environmental laws or regulations affecting TVA's fuel suppliers or transporters;

Purchased power price volatility and disruption of purchased power supplies;

Events which affect the supply of water for TVA's generation facilities;

Changes in TVA's determinations of the appropriate mix of generation assets;

Ineffectiveness of TVA's efforts at adapting its organization to an evolving marketplace and remaining cost competitive;

Inability to obtain, or loss of, regulatory approval for the construction or operation of assets;

The requirement or decision to make additional contributions to TVA's pension or other post-retirement benefit plans or to TVA's Nuclear Decommissioning Trust ("NDT") or Asset Retirement Trust ("ART");

Limitations on TVA's ability to borrow money which may result from, among other things, TVA's approaching or substantially reaching the limit on bonds, notes, and other evidences of indebtedness specified in the Tennessee Valley Authority Act of 1933, as amended, 16 U.S.C. §§ 831-831ee (the "TVA Act");

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An increase in TVA's cost of capital which may result from, among other things, changes in the market for TVA's debt securities, changes in the credit rating of TVA or the U.S. government, or, potentially, an increased reliance by TVA on alternative financing should TVA approach its debt limit;

Changes in the economy and volatility in financial markets;

Reliability and creditworthiness of counterparties;

Changes in the market price of commodities such as coal, uranium, natural gas, fuel oil, crude oil, construction materials, reagents, electricity, and emission allowances;

Changes in the market price of equity securities, debt securities, and other investments;

Changes in interest rates, currency exchange rates, and inflation rates;

Ineffectiveness of TVA's disclosure controls and procedures or its internal controls over financial reporting;

Inability to eliminate identified deficiencies in TVA's systems, standards, controls, or corporate culture;

Inability to attract or retain a skilled workforce;

Inability to respond quickly enough to current or potential customer demands or needs;

Events at a nuclear facility, whether or not operated by or licensed to TVA, which, among other things, could lead to increased regulation or restriction on the construction, ownership, operation, and decommissioning of nuclear facilities or on the storage of spent fuel, obligate TVA to pay retrospective insurance premiums, reduce the availability and affordability of insurance, increase the costs of operating TVA's existing nuclear units, and cause TVA to forego future construction at these or other facilities;

Loss of quorum of the TVA Board of Directors (the "TVA Board");

Changes in the membership of the TVA Board or TVA senior management; and

Other unforeseeable events.

See also Item 1A, Risk Factors, and Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations. New factors emerge from time to time, and it is not possible for management to predict all such factors or to assess the extent to which any factor, or combination of factors, may impact TVA's business or cause results to differ materially from those contained in any forward-looking statement. TVA undertakes no obligation to update any forward-looking statement to reflect developments that occur after the statement is made.

## GENERAL INFORMATION

### Fiscal Year

References to years (2017, 2016, etc.) in this Annual Report are to TVA's fiscal years ending September 30 except for references to years in the biographical information about directors and executive officers in Item 10, Directors, Executive Officers and Corporate Governance, as well as to years that are preceded by "CY," which references are to calendar years.

### Notes

References to "Notes" are to the Notes to Consolidated Financial Statements contained in Item 8, Financial Statements and Supplementary Data in this Annual Report.

### Property

TVA does not own real property. TVA acquires real property in the name of the United States, and such legal title in real property is entrusted to TVA as the agent of the United States to accomplish the purposes of the TVA Act. TVA acquires personal property in the name of TVA. Accordingly, unless the context indicates the reference is to TVA's personal property, any statement in this Annual Report referring to TVA property shall be read as referring to the real property of the United States which has been entrusted to TVA as its agent.

Available Information

TVA files annual, quarterly, and current reports with the Securities and Exchange Commission ("SEC") under Section 37 of the Securities Exchange Act of 1934. TVA's SEC filings are available to the public over the internet on the SEC's website at [www.sec.gov](http://www.sec.gov) or on TVA's website at [www.tva.gov](http://www.tva.gov). Information contained on TVA's website shall not be deemed to be incorporated into, or to be a part of, this Annual Report.

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PART I

ITEM 1. BUSINESS

The Corporation

The Tennessee Valley Authority ("TVA") is a corporate agency and instrumentality of the United States ("U.S.") that was created in 1933 by legislation enacted by the U.S. Congress in response to a request by President Franklin D. Roosevelt. TVA was created to, among other things, improve navigation on the Tennessee River, reduce the damage from destructive flood waters within the Tennessee River system and downstream on the lower Ohio and Mississippi Rivers, further the economic development of TVA's service area in the southeastern United States, and sell the electricity generated at the facilities TVA operates. Today, TVA operates the nation's largest public power system and supplies power to a population of over nine million people.

TVA manages the Tennessee River, its tributaries, and certain shorelines to provide, among other things, year-round navigation, flood damage reduction, and affordable and reliable electricity. Consistent with these primary purposes, TVA also manages the river system to provide recreational opportunities, adequate water supply, improved water quality, natural resource protection, and economic development. TVA performs these management duties in cooperation with other federal and state agencies which have jurisdiction and authority over certain aspects of the river system. In addition, the TVA Board of Directors (the "TVA Board") established two councils — the Regional Resource Stewardship Council and the Regional Energy Resource Council — under the Federal Advisory Committee Act to advise TVA on its stewardship activities in the Tennessee Valley and its energy resource activities.

Initially, all TVA operations were funded by federal appropriations. Direct appropriations for the TVA power program ended in 1959, and appropriations for TVA's stewardship, economic development, and multipurpose activities ended in 1999. Since 1999, TVA has funded all of its operations almost entirely from the sale of electricity and power system financings. TVA's power system financings consist primarily of the sale of debt securities and secondarily of alternative forms of financing such as lease arrangements. As a wholly-owned government corporation, TVA is not authorized to issue equity securities.

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Service Area

TVA's service area, the area in which it sells power, is defined by the TVA Act. TVA supplies power in most of Tennessee, northern Alabama, northeastern Mississippi, and southwestern Kentucky and in portions of northern Georgia, western North Carolina, and southwestern Virginia. Under the TVA Act, subject to certain minor exceptions, TVA may not, without specific authorization from the U.S. Congress, enter into contracts that would have the effect of making it, or the wholesale customers of TVA ("local power company customers" or "LPCs") that distribute TVA power, a source of power supply outside the area for which TVA or its LPCs were the primary source of power supply on July 1, 1957. This provision is referred to as the "fence" because it bounds TVA's sales activities, essentially limiting TVA to power sales within a defined service area.

Note

See Power Supply and Load Management Resources — Coal-Fired for a discussion of coal-fired units.

In addition, the Federal Power Act ("FPA") includes a provision that helps protect TVA's ability to sell power within its service area. This provision, called the "anti-cherry-picking" provision, prevents the Federal Energy Regulatory Commission ("FERC") from ordering TVA to provide access to its transmission lines to others to deliver power to customers within TVA's defined service area. As a result, the anti-cherry-picking provision reduces TVA's exposure to loss of customers.



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In 2017, the revenues generated from TVA's electricity sales were \$10.6 billion and accounted for virtually all of TVA's revenues. TVA's revenues by state for each of the last three years are detailed in the table below.

## Operating Revenues By State

For the years ended September 30

(in millions)

	2017	2016	2015
Alabama	\$1,524	\$1,504	\$1,582
Georgia	252	255	267
Kentucky	665	640	660
Mississippi	1,016	999	1,023
North Carolina	57	58	58
Tennessee	7,041	6,968	7,189
Virginia	47	48	50
Subtotal	10,602	10,472	10,829
Off-system sales	6	7	18
Revenue capitalized during pre-commercial plant operations <sup>(1)</sup>	(22 )	(18 )	—
Revenue from sales of electricity	10,586	10,461	10,847
Other revenues	153	155	156
Total operating revenues	\$10,739	\$10,616	\$11,003

## Note

(1) Represents revenue capitalized during pre-commercial operations of \$22 million at Watts Bar Nuclear Plant ("Watts Bar") Unit 2, Paradise Combined Cycle Plant, and Allen Combined Cycle Plant in 2017 and \$18 million at Watts Bar Unit 2 in 2016. See Note 1 — Pre-Commercial Plant Operations.

## Customers

TVA is primarily a wholesaler of power, selling power to LPCs which then resell power to their customers at retail rates. TVA's LPCs consist of (1) municipalities and other local government entities ("municipalities") and (2) customer-owned entities ("cooperatives"). These municipalities and cooperatives operate public power electric systems whose primary purpose is not to make a profit but to supply electricity to the general public or the cooperative's members. TVA also sells power directly to certain end-use customers, primarily large commercial and industrial loads and federal agencies with loads larger than 5,000 kilowatts ("kW"). Whether TVA or a LPC serves a new power customer is determined by reference to the TVA-LPC wholesale power contract. The contract contains a formula that balances the size of the LPC and the amount of any TVA infrastructure investment to determine which party is entitled to serve the new customer. In addition, power in excess of the needs of the TVA system may, where consistent with the provisions of the TVA Act, be sold under exchange power arrangements with other specific electric systems. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Results of Operations — Financial Results — Operating Revenues.

## Operating Revenues by Customer Type

For the years ended September 30

(in millions)

	2017	2016	2015
Revenue from sales of electricity			
Local power companies	\$9,741	\$9,696	\$9,998
Industries directly served	735	649	701
Federal agencies and other	132	134	148
Revenue capitalized during pre-commercial plant operations <sup>(1)</sup>	(22 )	(18 )	—
Revenue from sales of electricity	10,586	10,461	10,847
Other revenues	153	155	156

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Total operating revenues	\$10,739	\$10,616	\$11,003
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Note

(1) Represents revenue capitalized during pre-commercial operations of \$22 million at Watts Bar Unit 2, Paradise Combined Cycle Plant, and Allen Combined Cycle Plant in 2017 and \$18 million at Watts Bar Unit 2 in 2016. See Note 1 — Pre-Commercial Plant Operations.

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## Local Power Companies

Revenues from LPCs accounted for approximately 91 percent of TVA's total operating revenues in 2017. At September 30, 2017, TVA had wholesale power contracts with 154 LPCs. Each of these contracts requires the LPC to purchase from TVA all of its electric power and energy consumed within the TVA service area. Nearly all LPCs purchase power under contracts that require five, ten, or fifteen years notice to terminate.

The number of LPCs with the contract arrangements described below, the revenues derived from such arrangements in 2017, and the percentage of TVA's 2017 total operating revenues represented by these revenues are summarized in the table below.

TVA Local Power Company Customer Contracts  
At September 30, 2017

Contract Arrangements <sup>(1)</sup>	Number of LPCs	Sales to LPCs in 2017 (in millions)	Percentage of Total Operating Revenues in 2017
20-year termination notice	2	\$ 36	0.3 %
15-year termination notice	10	351	3.3 %
12-year termination notice	1	24	0.2 %
10-year termination notice	53	3,554	33.1 %
6-year termination notice	1	46	0.4 %
5-year termination notice	87	5,730	53.3 %
Total	154	\$ 9,741	90.6 %

## Note

(1) Ordinarily, the LPCs and TVA have the same termination notice period; however, in contracts with five of the LPCs with five-year termination notices, TVA has a 10-year termination notice (which becomes a five-year termination notice if TVA loses its discretionary wholesale rate-setting authority). Two of the LPCs have five-year termination notices or a shorter period if any act of Congress, court decision, or regulatory change requires or permits that election. Also, under TVA's contract with Bristol Virginia Utilities, a five-year termination notice may not be given by the LPC until January 2018.

TVA's two largest LPCs — Memphis Light, Gas and Water Division ("MLGW") and Nashville Electric Service ("NES") — have contracts with five-year and 10-year termination notice periods, respectively. Sales to MLGW and NES accounted for 10 percent and nine percent, respectively, of TVA's total operating revenues in 2017.

The power contracts between TVA and LPCs provide for the purchase of power by LPCs at the wholesale rates established by the TVA Board. Under Section 10 of the TVA Act, the TVA Board is authorized to regulate LPCs to carry out the purposes of the TVA Act through contract terms and conditions as well as through rules and regulations.

TVA regulates LPCs primarily through the provisions of TVA's wholesale power contracts. All of the power contracts between TVA and the LPCs require that power purchased from TVA be sold and distributed to the ultimate consumer without discrimination among consumers of the same class and prohibit directly or indirectly discriminatory rates, rebates, or other special concessions. In addition, there are a number of wholesale power contract provisions through which TVA seeks to ensure that the electric system revenues of the LPCs are used only for electric system purposes. Furthermore, almost all of these contracts specify the resale rates and charges at which the LPC must resell TVA power to its customers. These rates are revised from time to time, subject to TVA approval, to reflect changes in costs, including changes in the wholesale cost of power.

TVA also regulates LPC policies for customer deposits, termination of service for nonpayment, information to consumers, and billing through a service practice policy framework. TVA's regulatory framework provides for consistent regulatory policy for ratepayers across the Tennessee Valley, while recognizing local considerations. The regulatory provisions in TVA's wholesale power contracts are designed to carry out the objectives of the TVA Act, including the objective of providing for adequate supply of power at the lowest feasible rates. See Rates — Rate Methodology below.

#### Other Customers

Revenues from directly served industrial customers accounted for approximately seven percent of TVA's total operating revenues in 2017. Contracts with these customers are subject to termination by the customer or TVA upon a minimum notice period that varies according to a number of factors, including the customer's contract demand and the period of time service has been provided. TVA also serves seven federal customers, including U.S. Department of Energy ("DOE") facilities and military installations, which accounted for approximately one percent of TVA's total operating revenues in 2017.

#### Rates

##### Rate Authority

The TVA Act gives the TVA Board sole responsibility for establishing the rates TVA charges for power. These rates are not subject to judicial review or to review or approval by any state or federal regulatory body. Under the TVA Act, TVA is required to charge rates for power that will produce gross revenues sufficient to provide funds for:

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- Operation, maintenance, and administration of its power system;
- Payments to states and counties in lieu of taxes ("tax equivalents");
- Debt service on outstanding indebtedness;
- Payments to the U.S. Treasury in repayment of and as a return on the government's appropriation investment in TVA's power facilities (the "Power Program Appropriation Investment"); and
  - Such additional margin as the TVA Board may consider desirable for investment in power system assets, retirement of outstanding bonds, notes, or other evidences of indebtedness ("Bonds") in advance of maturity, additional reduction of the Power Program Appropriation Investment, and other purposes connected with TVA's power business.

In setting TVA's rates, the TVA Board is charged by the TVA Act to have due regard for the primary objectives of the TVA Act, including the objective that power shall be sold at rates as low as are feasible.

### Rate Methodology

In view of demand for electricity, the level of competition, and other relevant factors, TVA believes it is reasonable to assume that rates, set at levels that will recover TVA's costs, can be charged and collected from customers. Further, the TVA Board has the discretion to determine when costs will be recovered in rates. As a result of these factors, TVA records certain assets and liabilities that result from the self-regulated ratemaking process that could not otherwise be so recorded under accounting principles generally accepted in the United States. See Note 1 — Cost-Based Regulation and Note 7.

TVA uses a wholesale rate structure that is comprised of a base rate and a fuel rate that is automatically determined each month by the operation of the fuel cost adjustment formula. In setting the base rates, TVA uses a debt-service coverage ("DSC") methodology to derive annual revenue requirements in a manner similar to that used by other public power entities that also use the DSC rate methodology. Under the DSC methodology, rates are calculated so that an entity will be able to cover its operating costs and to satisfy its obligations to pay principal and interest on debt. This ratemaking approach is particularly suitable for use by entities financed primarily, if not entirely, by debt, such as TVA.

TVA's revenue requirements for costs or projected costs (other than the fuel, purchased power, and related costs covered by the fuel rate) are calculated under the DSC methodology in order to produce gross revenues sufficient to fund requirements specified in the TVA Act listed under Rate Authority above.

The DSC methodology reflects the cause-and-effect relationship between TVA's costs and the corresponding rates it charges for power. Once the revenue requirements (or projected costs) are determined, they are compared to the projected revenues for the year in question, at existing rates, to arrive at the shortfall or surplus of revenues as compared to the projected costs. Power rates are adjusted by the TVA Board to a level deemed to be sufficient to produce revenues approximately equal to projected costs (exclusive of the costs collected through the fuel rate).

A comprehensive rate restructuring was approved by the TVA Board on August 21, 2015, and implemented on October 1, 2015. The rate restructuring resulted in structural changes to base rates to improve cost alignment with capacity-related on-peak demand charges and seasonal time-of-use ("TOU") energy rates that differ by on-peak and off-peak periods to better reflect how TVA incurs generation costs. Minor changes in revenue allocation were made to improve alignment with cost-of-service, to keep industrial rates competitive, and to keep residential rates affordable. The 2015 TOU rate was unanimously adopted by TVA's LPCs and by nearly all of TVA's directly served customers.

TVA recovers fuel costs and tax equivalents payments associated with fuel cost adjustments through a monthly rate adjustment reflecting the costs paid by TVA for fuel. Prior to fiscal year 2016, all customers paid the same monthly

base fuel rate. On August 21, 2015, the TVA Board approved a new methodology to more accurately allocate fuel costs to two groups of customers: Standard Service (residential and small commercial customers) and Non-Standard Service (large commercial and industrial customers), each with a different monthly fuel rate better reflecting their group's contribution to total fuel costs. Fuel costs are now allocated to these customer groups in relation to their average hourly loads and TVA's hourly incremental dispatch costs. Total monthly fuel costs include costs for natural gas, fuel oil, coal, purchased power, emission allowances, nuclear fuel, and other fuel-related commodities as well as realized gains and losses on derivatives purchased to hedge the costs of such commodities.

In 2013, the TVA Board approved continuing the collection of Environmental Adjustment ("EA") charges to fund investment in environmental projects. TVA's EA was modified in 2015 to conform to the new wholesale and large-customer base rate designs. While revised slightly, the EA was designed to collect approximately the same revenue as before the rate structuring, approximately \$415 million and \$421 million in 2017 and 2016, respectively.

Subsequent to discussions with LPCs over the past two years, TVA made a rate change proposal to LPCs around the need for further improvements to wholesale and retail pricing during the fourth quarter of 2017. It is intended that changes keep rates low, ensure fairness in rates, and bring more stability in bills while being more responsive to customer choices. The proposed changes account for reliable grid service to ensure 24/7 on-demand energy when distributed energy resources may

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not be available. In addition, it is anticipated that the proposed changes would allow consumers to make more informed investment decisions and stimulate economic growth.

On August 23, 2017, the TVA Board approved an annual base rate adjustment with the goal of increasing 2018 revenues by approximately \$195 million. This adjustment equates to an approximately 2.4 percent wholesale rate increase (excluding fuel).

Power Supply and Load Management Resources

General

TVA seeks to balance production capabilities with power supply requirements by promoting the conservation and efficient use of electricity and, when necessary, buying, building, or leasing assets or entering into power purchase agreements. TVA also intends to employ a diverse mix of energy generating sources and is working toward obtaining greater amounts of its power supply from clean (low or zero carbon emitting) resources.

Power generating facilities operated by TVA at September 30, 2017, included 29 conventional hydroelectric sites, one pumped-storage hydroelectric site, eight coal-fired sites, three nuclear sites, 16 natural gas and/or oil-fired sites, one diesel generator site, 16 solar energy sites, digester gas cofiring capacity at one coal-fired site, and biomass cofiring potential (located at coal-fired sites), although certain of these facilities were out of service as of September 30, 2017. See Item 2, Properties — Generating Properties — Net Capability for a discussion of these facilities. TVA also acquires power under power purchase agreements of varying durations including short-term contracts of less than 24-hours in duration. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Results of Operations — Financial Results — Operating Expenses.

The following charts show TVA's generation and purchased power by generating source as a percentage of all electric power generated and purchased (based on kilowatt hours ("kWh")) for the periods indicated:

Note

Renewable resources (non-hydro) from TVA facilities are less than one percent for all periods shown, and therefore are not represented on the charts above. Purchased power contains the majority of non-hydro renewable energy supply.

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## Nuclear

At September 30, 2017, TVA had three nuclear sites consisting of seven units in operation. The units at Browns Ferry Nuclear Plant ("Browns Ferry") are boiling water reactor units, and the units at Sequoyah Nuclear Plant ("Sequoyah") and Watts Bar Nuclear Plant ("Watts Bar") are pressurized water reactor units. Statistics for each of these operating units are included in the table below.

## TVA Nuclear Power

At September 30, 2017

Nuclear Unit	Nameplate Capacity (MW)	Net Capacity Factor for 2017 (%)	Date of Expiration of Operating License
Sequoyah Unit 1	1,221	83.5	2040
Sequoyah Unit 2	1,221	86.5	2041
Browns Ferry Unit 1	1,264	89.1	2033
Browns Ferry Unit 2	1,190	82.6	2034
Browns Ferry Unit 3	1,190	97.4	2036
Watts Bar Unit 1	1,270	83.6	2035
Watts Bar Unit 2	1,220	54.8	2055

Extended Power Uprate. On August 14, 2017, the Nuclear Regulatory Commission ("NRC") approved TVA's request for a 465 MW extended power uprate ("EPU") project at Browns Ferry. TVA plans to begin implementing the EPU project during the plant refueling outages in the spring of 2018 for Unit 3, the fall of 2018 for Unit 1, and the spring of 2019 for Unit 2. Full EPU power is expected to be achieved following the noted outages for each unit. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Key Initiatives and Challenges — Generation Resources — Extended Power Uprate and Note 21 — Administrative Proceeding Regarding Browns Ferry Nuclear Plant Extended Power Uprate.

Other Nuclear Initiatives. TVA has submitted an Early Site Permit Application to the NRC to license small modular reactors ("SMRs") at TVA's Clinch River Site in Oak Ridge, Tennessee. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Key Initiatives and Challenges — Generation Resources — Small Modular Reactors.

Other Nuclear Matters. Operating nuclear facilities subjects TVA to waste disposal, decommissioning, and insurance requirements, as well as litigation risks. See Fuel Supply — Nuclear Fuel below for a discussion of spent nuclear fuel and low-level radioactive waste, Note 21 — Contingencies for a discussion of TVA's nuclear decommissioning liabilities and the related trust and nuclear insurance, and Note 21 — Legal Proceedings for a discussion of legal and administrative proceedings related to TVA's nuclear program, which discussions are incorporated herein by reference.

## Coal-Fired

TVA began its coal-fired plant construction program in the 1940s, and its coal-fired units were placed in service between 1951 and 1973. Coal-fired units are either active or retired. TVA considers units to be in an active state when the unit is generating, available for service, or temporarily unavailable due to equipment failures, inspections, or repairs. All other coal-fired units are considered retired. As of September 30, 2017, TVA had eight coal-fired plants consisting of 33 active units, accounting for 9,055 MW of summer net capability, and 26 retired units.

Coal-fired plants have been subject to increasingly stringent regulatory requirements over the last few decades, including those under the Clean Air Act ("CAA") and the regulations promulgated thereunder. Increasing regulatory costs have caused TVA to consider whether or not to make the required capital investments to continue operating



these coal-fired facilities. In April 2011, TVA entered into two agreements (collectively, the "Environmental Agreements") to address a dispute under the CAA. The first agreement is a Federal Facilities Compliance Agreement with the Environmental Protection Agency ("EPA"). The second agreement is with Alabama, Kentucky, North Carolina, Tennessee, and three environmental advocacy groups: the Sierra Club, National Parks Conservation Association, and Our Children's Earth Foundation. Under the Environmental Agreements, TVA agreed to retire 18 of its 59 coal-fired units by the end of 2017 and was generally absolved from any liability, subject to certain limitations and exceptions, under the New Source Review ("NSR") requirements of the CAA for maintenance, repair, and component replacement projects that were commenced at TVA's coal-fired units prior to the execution of the agreements. TVA also agreed to retire, repower, or install air pollution controls on 16 of the remaining coal-fired units. Failure to comply with the terms of the Environmental Agreements would subject TVA to penalties stipulated in the agreements. TVA is taking the actions necessary to comply with the Environmental Agreements, and is confident that it has adequate capacity to meet the needs of its customers after units are retired under the Environmental Agreements. See Natural Gas and/or Oil-Fired below.

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The following table summarizes the actions TVA is required to take under the Environmental Agreements and other coal-fired generation related actions taken or to be taken by TVA.

Fossil Plant	Units	Existing Scrubbers and SCRs <sup>(1)</sup>	Requirements Under Environmental Agreements	Actions Taken by TVA	Actions Planned to be Taken by TVA
Allen	3	SCRs on all three units	- Install scrubbers or retire no later than December 31, 2018	- The TVA Board approved the construction of a gas-fired plant at the current location of the Allen coal-fired site	- Retire Units 1-3 after completion of the gas-fired plant, before December 31, 2018
Bull Run	1	Scrubber and SCRs on unit	- Continuously operate existing emission control equipment  - Remove from service, control <sup>(2)</sup> , convert <sup>(3)</sup> , or retire Units 1-4 no later than June 30, 2016	- Continuously operate existing emission control equipment	- Continuously operate existing emission control equipment
Colbert	5	SCR on Unit 5	- Remove from service, control <sup>(2)</sup> , or retire Unit 5 no later than December 31, 2015  - Control or retire removed from service units within three years	- Retired Units 1-5 on April 16, 2016	- No further action required
Cumberland	2	Scrubbers and SCRs on both units	- Continuously operate existing emission control equipment	- Continuously operate existing emission control equipment  - The TVA Board approved adding scrubbers and SCRs on all four units	- Continuously operate existing emission control equipment
Gallatin	4	None	- Control <sup>(2)</sup> , convert <sup>(3)</sup> , or retire all four units no later than December 31, 2017  - Retire two units no later than December 31, 2012 - Remove from service two units no later than December 31, 2012	- Scrubbers added to four units during 2016 - Two SCRs placed in service in 2017	- Place remaining two SCRs in service by December 31, 2017
John Sevier	4	None	- Retire those units no later than December 31, 2015  - Retire six units no later than December 31, 2015	- Retired Units 1 and 2 on December 31, 2012 - Retired Units 3 and 4 on June 25, 2014	- No further action required
Johnsonville	10	None	- Retire four units no later than December 31, 2017	- Retired Units 5-10 on December 31, 2015	- Retire Units 1-4 by December 31, 2017
Kingston	9	Scrubbers and SCRs on all nine units	- Continuously operate existing emission control equipment	- Continuously operate existing emission control equipment	- Continuously operate existing emission control equipment
Paradise	3	Scrubbers and SCRs on all three units	- Upgrade scrubbers on Units 1 and 2 no later than December 31, 2012	- The TVA Board approved the construction of a gas-fired plant at the current	- Continuously operate existing emission control equipment on

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			- Continuously operate emission control equipment on Units 1-3	location of the Paradise coal-fired plant - Upgraded scrubbers on Units 1 and 2 - Retired Units 1 and 2 on April 15, 2017	Unit 3
Shawnee	10	None	- Control <sup>(2)</sup> , convert <sup>(3)</sup> , or retire Units 1 and 4 no later than December 31, 2017	- Retired Unit 10 on June 30, 2014	- Add scrubbers and SCRs on Units 1 and 4 by December 31, 2017 - Continuously operate existing emission control equipment
Widows Creek	8	Scrubbers and SCRs on Units 7 and 8	- Retire two of Units 1-6 no later than July 31, 2013 - Retire two of Units 1-6 no later than July 31, 2014 - Retire two of Units 1-6 no later than July 31, 2015 - Continuously operate existing emissions control equipment on Units 7 and 8	- Retired Units 3 and 5 on July 31, 2013 - Retired Units 1, 2, 4, and 6 on July 31, 2014 - Retired Units 7 and 8 on September 30, 2015	- No further action required

Notes

(1) Selective catalytic reduction systems ("SCRs")

(2) If TVA decides to add emission controls to these units, TVA must continuously operate the emission controls once they are installed.

(3) Convert to renewable biomass

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After TVA completes the actions described in the above table, TVA anticipates that it will have 7,891 MW of summer net capability of coal-fired generation, a reduction of 6,682 MW from TVA's coal-fired capacity as of September 30, 2010. TVA is moving toward a more balanced generation plan with greater reliance on lower-cost and cleaner energy generation technologies. TVA's long-range plans will continue to consider the costs and benefits of significant environmental investments at its remaining coal-fired plants.

### Natural Gas and/or Oil-Fired

On September 30, 2017, TVA's natural gas and oil-fired fleet consisted of 102 combustion turbine power blocks (87 simple-cycle units and 15 combined-cycle power blocks). The 87 simple-cycle units provide a maximum of 5,731 MW of summer net capability. The 15 combined-cycle power blocks provide a maximum of 5,672 MW of summer net capability. Eighty of the simple-cycle units and one combined-cycle power block are fueled by either natural gas or fuel oil. The remaining seven simple-cycle units and 14 combined-cycle power blocks are fueled by natural gas only. Sixty of the simple-cycle units are currently capable of quick-start response allowing full generation capability in approximately 10 minutes. The economic dispatch of natural gas-fired plants depends on both the day-to-day price of natural gas and the price of other available intermediate resources like coal-fired plants. TVA uses simple-cycle units to meet peaking or backup power needs.

TVA's strategy of portfolio diversification and air emissions reductions includes the addition of natural gas-fired plants to its generation fleet. In April 2017, TVA completed a natural gas-fired facility at the Paradise Fossil Plant ("Paradise") with a generation capacity of approximately 1,100 MW. At September 30, 2017, TVA had one natural gas-fired generation facility under construction. The facility, with an expected generation capacity of approximately 1,100 MW, is being constructed at the Allen Fossil Plant ("Allen"). This facility is expected to be completed in 2018. Upon completion of the facility at Allen, the existing coal-fired units will be retired. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Key Initiatives and Challenges — Generation Resources — Natural Gas-Fired Units.

See Item 2, Properties — Generating Properties, Note 9, Note 10, and Note 13 for a discussion of lease arrangements into which TVA has entered in connection with certain combustion turbine units. Because of TVA's strategy of portfolio diversification and reduction of air emissions, TVA may decide to make further strategic investments in natural gas-fired facilities in the future by purchase, construction, or lease.

### Hydroelectric

**Conventional Hydroelectric Dams.** TVA maintains 29 conventional hydroelectric dams with 109 generating units throughout the Tennessee River system for the production of electricity. At September 30, 2017, these units accounted for 3,777 MW of summer net capability. The amount of electricity that TVA is able to generate from its hydroelectric plants depends on a number of factors, including the amount of precipitation and runoff, initial water levels, generating unit availability, and the need for water for competing water management objectives. When these factors are unfavorable, TVA must increase its reliance on higher cost generation plants and purchased power. In addition, a portion of energy generated by nine U.S. Army Corps of Engineers ("USACE") dams on the Cumberland River system contribute to the TVA power system. See Weather and Seasonality below and Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Key Initiatives and Challenges — Dam Safety and Remediation Initiatives.

**Raccoon Mountain Pumped-Storage Plant.** The four units at Raccoon Mountain Pumped-Storage Plant ("Raccoon Mountain") were placed in service during 1978 and 1979. The units, with a total net summer capability of 1,616 MW, are utilized to balance the transmission system as well as generate power. TVA uses electricity generated by its coal-fired and nuclear plants during periods of low demand to operate pumps that fill the reservoir at Raccoon

Mountain. Then, during period of high or peak demand, the water is released and the pumps reverse to work as power generating turbines.

Hiwassee Hydro Unit 2. Hiwassee Hydro Unit 2 has a unique reversible turbine/generator that acts as a pump and a turbine enhancing TVA's ability to balance baseload generation. Hiwassee Hydro Unit 2 has a summer net capability of 86 MW.

Hydro Modernization Program. In 1992, TVA began a Hydro Modernization Program to address reliability issues related to its hydroelectric units. At September 30, 2017, modernization had been completed on 59 conventional hydroelectric units, including Pickwick Landing Dam ("Pickwick") Unit 4 and Watauga Unit 1 in 2017, and Raccoon Mountain. The modernization projects resulted in 432 MW of increased capacity from the conventional hydroelectric units, with an average efficiency gain of approximately five percent. Pickwick Unit 3 and South Holston Unit 1 are currently undergoing major maintenance projects to ensure long-term reliability. Hydroelectric generation will continue to be an important part of TVA's energy mix, so TVA continues to assess its remaining conventional hydroelectric units for opportunities to improve reliability through major maintenance projects.

#### Other Renewable Energy Resources

TVA's renewable energy portfolio includes both TVA-owned assets and renewable energy purchases. TVA owns 16 solar sites. Certain coal-fired units have the capability for digester gas and biomass cofiring, which is accounted for as coal-fired generation summer net capability. The TVA-owned solar sites provide approximately 1 MW of summer net capability.

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TVA tracks its renewable energy claims through the management of renewable energy certificates ("RECs"). The RECs, which each represent 1 MWh of renewable energy generation, are principally associated with non-hydroelectric renewable energy. In May 2017, TVA retired over 4.5 million RECs, which were principally from purchased power. Additionally, TVA retires RECs on behalf of customers in the Green Power Switch® ("GPS") program and other customer-based programs that enable customers to claim RECs.

### Diesel Generators

As of September 30, 2017, TVA had one diesel generator plant consisting of five units, and this facility accounted for 9 MW of summer net capability.

### Distributed Energy Resources

During 2015, the TVA Board approved the 2015 Integrated Resource Plan ("IRP") as a guide in making decisions about the energy resources TVA may use to meet future demand for electricity in the Tennessee Valley. The purpose of integrated resource planning is to meet future power demand by identifying the need for generating capacity and determining the best mix of resources to meet the need on a least-cost, system-wide basis. These resources, together with other options that are typically connected to the distribution systems of the LPCs, represent a new component in the utility marketplace called distributed energy resources ("DER"). The 2015 IRP affirms the merits of a diverse portfolio including energy efficiency/demand response resources and renewable energy. Changes to TVA load forecasts and the recognition of the increasing penetration of generation and energy management technologies require an awareness of the evolving role of energy efficiency, demand response, and renewable generation.

TVA is primarily a wholesale power provider, and the LPCs are the service provider for most end-use customers. Due to this public power business model, TVA is working with LPCs and others in the region to optimize new and existing DER offerings and delivery mechanisms. TVA plans to engage LPCs as it considers new and innovative ways to ensure that evolving resource portfolios remain reliable and provide the most value to all customers. This engagement is part of an emerging DER strategy to leverage the strengths of the public power model with distributed energy resources that are economic, sustainable, and flexible and considers three key focus areas:

- Partnerships that position TVA customers as trusted energy advisors,
- Pricing aligned to cover cost while adding value to the customer and the TVA system, and
- Programs that enable innovation, flexibility, and fair and equitable consumer choice.

The IRP considered a broad range of feasible supply-side and demand-side options and assessed them with respect to economic and environmental impacts. Energy efficiency was modeled as a selectable, supply-side equivalent resource. Implementing energy efficiency programs will require close cooperation among TVA, local stakeholders, LPCs, and electric customers, particularly around deployment of additional energy efficiency resources. The success of energy efficiency depends on end-use customer participation. Energy efficiency standards, including DOE standards, TVA's energy efficiency programs, and individual customer and consumer actions, accounted for seven percent of TVA's 2017 resource mix and six percent of TVA's 2016 resource mix.

TVA, in cooperation with its customers, continues to implement a broad portfolio of programs and projects through the EnergyRight® Solutions ("ERS") program. The ERS program includes electrification, energy efficiency, demand response, and system load enhancement programs and projects designed to help reduce long-term energy supply costs in the TVA service area. Through these programs, TVA realized 379 gigawatt hours ("GWh") and 381 GWh of energy efficiency savings in 2017 and 2016, respectively. This portfolio also provided 1,547 MW and 1,614 MW of demand response in 2017 and 2016, respectively, to provide system reliability and offset the need for new generation.

Renewable Energy Programs. TVA's GPS program is a voluntary REC program that supports the production of renewable energy by allowing consumers to purchase such energy blocks either through the LPCs or from TVA for directly served customers. Supply for the retail portion of the program is sourced from within the TVA service area and sold in 150 kWh blocks. In addition to the GPS program, TVA continues to test a lower-priced bulk option under GPS, Southeastern RECs, that allows for larger customers located within certain portions of TVA's service area to purchase RECs. Supply for the bulk option is sourced from TVA-contracted purchased power outside of the TVA service area. In total, consumers participating in both GPS and Southeastern RECs purchased 67,550 MWh and 164,577 MWh of renewable energy, respectively, in CY 2016.

TVA continues to offer the Green Power Providers ("GPP") program for the purpose of encouraging the development of small-scale solar, wind, biomass, and hydroelectric generation systems across the Tennessee Valley that are 50 kW or less. As of September 30, 2017, the combined participation for the original Generation Partners ("GP") pilot program and the GPP program comprised 105 MW of installed operating capacity with nearly 4 MW of additional approved capacity in the GPP program that has yet to become operational.

The Renewable Standard Offer ("RSO") program was a voluntary program that began in 2011 to increase the amount of renewable energy generated in TVA's service territory. This program offers pre-set prices, terms, and conditions for power

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generated by selected, commercially available renewable energy technologies. Solar, wind, biogas and specific biomass projects are included in the program. Projects must be greater than 50 kW, but no greater than 20 MW, in nameplate capacity. As of September 30, 2017, TVA had over 93 MW of installed operating capacity with nearly 104 MW of additional approved capacity under contract. The RSO offering ended in 2015, but the program remains open to projects that have existing capacity allocations and are in the process of being completed.

In an effort to continue to evaluate the value of small to medium scale renewable projects, TVA extended the Solar Solution Initiative ("SSI"), by transitioning the program to the Distributed Solar Solutions ("DSS") pilot at the beginning of 2016. SSI was a targeted incentive program that aimed to support the existing local solar industry while also serving as a recruitment tool for new industry in the Tennessee Valley region by retaining and adding investment and jobs. The program provided incentive payments for mid-sized (greater than 50 kW up to 1 MW) solar projects in TVA's RSO program if the projects used local certified installers in the Tennessee Valley region. As of September 30, 2017, TVA had over 36 MW of installed operating capacity under the SSI program with nearly 9 MW of additional approved capacity under contract. DSS is designed to encourage renewable energy projects that are directed by TVA's LPCs. Projects can range in size from greater than 50 kW up to 2 MW of solar electric energy. For CY 2017, TVA awarded 10 MW of renewable solar capacity to seven projects, all in different LPC territories.

New energy management systems and energy storage technologies present opportunities for more sophisticated and integrated operation of the entire grid. The advent of electric vehicles and small-scale renewable generation has hastened the development of battery technologies that have the potential to mitigate the intermittent supply issues associated with many renewable generation options. Implementation of the technologies in conjunction with two-way communication to the site creates the potential for better management of other DER on the grid.

Onsite energy management technologies and the proliferation of companies interested in providing services to support and aggregate the impacts of such systems provide another DER avenue. Such systems can afford the consumer benefits through reduced consumption, increased comfort, detailed energy use data, and savings from time-sensitive rate structures. TVA and LPCs must consider the integration of the impacts from changes in energy usage patterns resulting from the application of such systems.

Demand response systems that take advantage of the increasing communications sophistication to homes, businesses, and distribution system assets also afford the opportunity for more granular control of system demand. Technologies can manage individual customer systems to shift usage from peak to off-peak periods and create significant reductions in the need for peak generation output. More sophisticated distribution control systems can also lower peak demand through control of excess voltage on the grid on either a dispatchable or continuous basis.

TVA is leading an initiative to determine the value of DER for its system. Initial efforts are focused on small-scale distributed (rooftop) solar, but the method is general enough to allow for other distributed options. Work is ongoing, led by a team that includes technical support from the Electric Power Research Institute ("EPRI"), to develop a methodology to identify site preferences on the distribution systems of the LPCs. This work, along with locational analysis already completed by TVA, will help in placing utility-scale solar in furtherance of the IRP recommendations as well as distributed solar to meet the needs of LPCs. See Research and Development below.

## Purchased Power and Other Agreements

TVA acquires power from a variety of power producers through long-term and short-term power purchase agreements as well as through spot market purchases. During 2017, TVA acquired approximately 12 percent of the power that it purchased on the spot market, approximately two percent through short-term power purchase agreements, and approximately 86 percent through the long-term power purchase agreements described below, including agreements for long-term renewable generation resources.





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A portion of TVA's capability provided by power purchase agreements is provided under contracts that expire between 2023 and 2038, and the most significant of these contracts (excluding wind contracts) are described in the table below. Power Purchase Contracts (Excluding Wind Contracts)

At September 30, 2017

Type of Facility	Location	Summer Net Capability (MW)	Contract Termination Date
Lignite	Mississippi	440	2032
Natural gas	Alabama	720	2023
Natural gas	Alabama	615	2026
Solar	Alabama	75	2037
Solar <sup>(1)</sup>	Tennessee	53	2038
Hydroelectric <sup>(2)</sup>	Tennessee and Kentucky	347	Upon three years' notice

Notes

(1) Power delivery is expected to commence in December 2018.

(2) TVA's contract with SEPA is for 405 MW of capacity; however, at September 30, 2017, TVA's capacity under the contract was 347 MW because of repairs being completed by the USACE. TVA expects this period of reduced capacity to be in effect until 2019.

TVA executed a power purchase contract with a solar facility located in northwest Alabama and expanded its supply of renewable energy when the facility was commissioned in November 2016. A second solar facility under contract located in western Tennessee is expected to begin commercial operation during the first quarter of 2018. TVA, along with others, contract with the Southeastern Power Administration ("SEPA") to obtain power and energy from nine USACE hydroelectric facilities on the Cumberland River system. The agreement with SEPA can be terminated upon three years' notice. The contract requires SEPA to provide TVA an annual minimum number of hours of energy for each megawatt of TVA's capacity allocation, and all surplus energy from the hydroelectric facilities on the Cumberland River system. These contracts have been included in the table above.

Under federal law, TVA is required to purchase energy from qualifying facilities (cogenerators and small power producers) at TVA's avoided cost of either generating this energy itself or purchasing this energy from another source. TVA fulfills this requirement through the Dispersed Power Production Program. As of September 30, 2017, there were 30 generation sources, with a combined qualifying capacity of 258 MW, whose power TVA purchases under this law.

As of September 30, 2017, TVA was a party to contracts with eight wind farms for the purchase of energy. TVA's most significant wind contracts are described in the table below.

Wind Contracts

At September 30, 2017

Location of Wind Farm	Contracted Nameplate Capacity (in MW)	Date Delivery Began	Contract Termination Date
Iowa	198	2010	2031
Iowa	101	2012	2030
Kansas	201	2012	2032
Kansas	165	2013	2033
Illinois	150	2012	2032
Illinois	200	2012	2032
Illinois	200	2013	2033

In addition, TVA has contracted for 27 MW of nameplate renewable energy capacity from 15 wind turbine generators located on Buffalo Mountain near Oak Ridge, Tennessee, 4.8 MW of nameplate capacity from a landfill gas facility

near Knoxville, Tennessee, and 4.5 MW of nameplate capacity from a solar farm in Haywood County, Tennessee.

## Fuel Supply

### General

TVA's consumption of various types of fuel depends largely on the demand for electricity by TVA's customers, the availability of various generating units, and the availability and cost of fuel. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Results of Operations — Financial Results — Operating Expenses.

### Nuclear Fuel

Current Fuel Supply. Converting uranium to nuclear fuel generally involves four stages: the mining and milling of uranium ore to produce uranium concentrates; the conversion of uranium concentrates to uranium hexafluoride gas; the

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enrichment of uranium hexafluoride; and the fabrication of the enriched uranium hexafluoride into fuel assemblies. For its forward four-year (2018-2021) requirements, TVA currently has 100 percent of its uranium mining and milling, conversion services, enrichment services, and fabrication services requirements either in inventory or under contract with various suppliers. TVA anticipates being able to fill its needs beyond this period by normal contracting processes as market forecasts indicate that the fuel cycle components will be readily available. See Note 15 — Counterparty Risk.

TVA, DOE, and certain nuclear fuel contractors have entered into agreements providing for surplus DOE highly enriched uranium (uranium that is too highly enriched for use in a nuclear power plant) to be blended with other uranium. The enriched uranium that results from this blending process, which is called blended low-enriched uranium ("BLEU"), is fabricated into fuel that can be used in a nuclear power plant. This blended nuclear fuel was first loaded in a Browns Ferry reactor in 2005 and the last reload of BLEU material was loaded in a Browns Ferry reactor in the spring of 2017. BLEU fuel was loaded into Sequoyah Unit 2 three times but is not expected to be used in the Sequoyah reactors in the future. There is a potential to receive additional BLEU fuel beginning in 2018, and it would be used in future Browns Ferry reloads.

Under the terms of an interagency agreement between the DOE and TVA, in exchange for supplying highly enriched uranium materials for processing into usable BLEU fuel for TVA, the DOE participates in the savings generated by TVA's use of this blended nuclear fuel. See Note 1 — Blended Low-Enriched Uranium Program for a more detailed discussion of the BLEU project.

**Mixed Oxide Nuclear Fuel.** Under the DOE Surplus Plutonium Disposition ("SPD") Program, mixed oxide ("MOX") fuel would be fabricated with surplus plutonium and depleted uranium as a replacement for commercial uranium fuel. In February 2010, the DOE and TVA entered into an interagency agreement to evaluate the potential use of MOX fuel in reactors at Browns Ferry and Sequoyah. As part of the evaluation of MOX fuel, TVA participated as a cooperating agency in the DOE's development of the April 2015 final supplemental environmental impact statement that addresses the potential use of MOX fuel in the TVA reactors. A decision to use MOX fuel is not required or expected for several years. At the earliest, based on the expected production rate of MOX fuel, TVA could start using a small number of MOX fuel assemblies in TVA reactors after 2020. TVA's three criteria for implementing MOX fuel are that it must be environmentally and operationally safe; it must be economical compared to other nuclear fuel used by TVA; and it must be licensed by the NRC for use. If TVA decides to use MOX fuel and the NRC approves its use, some changes in the operation of the reactors are expected, and additional equipment may be required. As TVA continues to evaluate fuel options, current fuel supply plans do not include MOX fuel.

**Low-Level Radioactive Waste.** Low-level radioactive waste ("radwaste") results from certain materials and supplies used in the normal operation of nuclear electrical generation units. TVA sends shipments of radwaste to burial facilities in Clive, Utah and Andrews, Texas. TVA is capable of storing some radwaste at its own facilities for an extended period of time, if necessary.

**Spent Nuclear Fuel.** All three nuclear sites have dry cask storage facilities. Sequoyah will need additional capacity by 2028. Watts Bar will need additional capacity by 2041. Browns Ferry will need additional storage capacity by the end of 2020. A project is underway at Browns Ferry to build another independent spent fuel storage installation pad, and is scheduled for completion by January 2020. To recover the cost of providing long-term, onsite storage for spent nuclear fuel, TVA filed a breach of contract suit against the United States in the Court of Federal Claims in 2001. As a result of this lawsuit and related agreements, TVA has collected approximately \$217 million through 2017.

**Tritium-Related Services.** TVA and the DOE are engaged in a long-term interagency agreement under which TVA will, at the DOE's request, irradiate tritium-producing burnable absorber rods ("TPBARs") to assist the DOE in producing tritium for the Department of Defense ("DOD"). This agreement, which ends in 2035, requires the DOE to

reimburse TVA for the costs that TVA incurs in connection with providing irradiation services and to pay TVA an irradiation services fee at a specified rate per TPBAR over the period when irradiation occurs.

In general, TPBARs are irradiated for one operating cycle, which lasts about 18 months. At the end of the cycle, TVA removes the irradiated rods and loads them into a shipping cask. The DOE then ships them to its tritium-extraction facility. TVA loads a fresh set of TPBARs into the reactor during each refueling outage. Irradiating the TPBARs does not affect TVA's ability to safely operate the reactors to produce electricity.

TVA has provided irradiation services using only Watts Bar Unit 1 since 2003. Although the interagency agreement provides for irradiation services to be performed at Watts Bar and Sequoyah, TVA expects the Watts Bar site to provide sufficient capacity to fulfill this agreement in the near term. In December 2015, the DOE notified TVA of future increased needs for tritium requiring the use of a second reactor. TVA was a cooperating agency in the February 2016 DOE Final Supplemental Environmental Impact Statement for the Production of Tritium in a Commercial Light Water Reactor. On April 5, 2017, due to an anticipated need for more TPBARs, the DOE announced its preferred alternative for irradiation services which included use of an additional reactor. As a result of TVA's assessment and concurrence with the DOE's alternative, TVA is planning to submit a license amendment to the NRC in CY 2017 to authorize the irradiation of TPBARs in Watts Bar Unit 2. Subject to approval of the license amendment, tritium production in Watts Bar Unit 2 is projected to start in the fall of 2020. The DOE's decision also allows for irradiation of TPBARs at the Sequoyah site in the future; however, TVA does not have plans to employ Sequoyah units for tritium production in the near term.

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Coal

Coal consumption at TVA's coal-fired generating facilities during 2017 and 2016 was approximately 21 million tons and 24 million tons, respectively. At September 30, 2017, and September 30, 2016, TVA had 36 days and 31 days of system-wide coal supply at full burn rate, respectively, with net book values of \$253 million and \$252 million, respectively.

TVA utilizes both short-term and long-term (longer than one year) coal contracts. During 2017, long-term contracts made up 98 percent of coal purchases and short-term contracts accounted for the remaining two percent. TVA plans to continue using contracts of various lengths, terms, and coal quality to meet its expected consumption and inventory requirements. During 2017 and 2016, TVA purchased coal by basin as follows:

The following charts present the proportion of each delivery method TVA utilizes for its coal supply for the periods indicated:

Generally, total system coal inventories were at or below target levels for 2017 due to higher than planned coal-fired generation requirements to support less hydroelectric generation. However, some facilities were above the target levels as TVA began to adjust inventory levels for unit retirements.

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### Natural Gas and Fuel Oil

During 2017, TVA purchased a significant amount of its natural gas requirements from a variety of suppliers under contracts with terms of up to three years and purchased substantially all of its fuel oil requirements on the spot market. See Note 15 — Derivatives Not Receiving Hedge Accounting Treatment — Derivatives Under FTP. The net book value of TVA's natural gas inventory was \$15 million and \$7 million at September 30, 2017, and 2016, respectively. The net book value of TVA's fuel oil inventory was \$87 million and \$86 million at September 30, 2017, and 2016, respectively. At September 30, 2017, 80 of the combustion turbines that TVA operates were dual-fuel capable, and TVA has fuel oil stored on each of these sites as a backup to natural gas.

TVA purchases natural gas from multiple suppliers on a daily, monthly, seasonal, and annual basis. During 2017, daily, monthly, seasonal, and annual contracts accounted for 38 percent, 11 percent, 20 percent and 31 percent of purchases, respectively. TVA plans to continue using contracts of various lengths and terms to meet the projected natural gas needs of its natural gas fleet. During 2017, TVA transported natural gas on eight separate pipelines, with approximately 37 percent being transported on a single pipeline. During 2017, TVA maintained a total of approximately 1,188,500 Million British thermal unit(s) ("mmBtu") per day of firm transportation capacity on 7 major pipelines, with approximately 35 percent of total firm transportation capacity being maintained on a single pipeline.

TVA utilizes natural gas storage services at six facilities with a total capacity of 8.83 billions per cubic feet ("Bcf") of firm service and 0.80 Bcf of interruptible service to manage the daily balancing requirements of the eight pipelines used by TVA, with approximately 31 percent of the total storage capacity being maintained at a single facility. During 2017, storage levels were generally maintained at between 40 and 80 percent of the maximum contracted capacity at each facility. As TVA's natural gas requirements grow, it is anticipated that additional storage capacity will be acquired to meet the needs of the generating assets as well as their operating requirements. In 2018, TVA does not expect to add a significant amount of firm capacity to its storage portfolio.

### Transmission

The TVA transmission system is one of the largest in North America. TVA's transmission system has 69 interconnections with 13 neighboring electric systems, and delivered nearly 155 billion kWh of electricity to TVA customers in 2017. In carrying out its responsibility for transmission grid reliability in the TVA service area, TVA has operated with 99.999 percent reliability since 2000 in delivering electricity to customers. See Item 2, Properties — Transmission Properties.

To the extent that federal law requires access to the TVA transmission system, TVA offers transmission services to others to transmit wholesale power in a manner that is comparable to TVA's own use of the transmission system. TVA has also adopted and operates in accordance with its published Transmission Standards of Conduct and separates its transmission function from its power marketing function.

TVA is subject to federal reliability standards that are set forth by the North American Electric Reliability Corporation ("NERC") and approved by FERC. These standards are designed to maintain the reliability of the bulk electric system, including TVA's generation and transmission system, and include areas such as maintenance, training, operations, planning, modeling, critical infrastructure, physical and cyber security, vegetation management, and facility ratings. TVA recognizes that reliability standards and expectations continue to become more complex and stringent for transmission systems. At present there are approximately 90 mandatory standards subject to enforcement containing approximately 1,300 requirements and sub-requirements that must be met. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Key Initiatives and Challenges — Regulatory Compliance — Transmission Issues.

Additional transmission upgrades may be required to maintain reliability. TVA invested \$404 million between 2011 and 2017 to maintain reliability as a result of retired coal-fired units, and estimates future expenditures to be approximately \$30 million for 2018 to 2020. Upgrades may include enhancements to existing lines and substations or new installations as necessary to provide adequate power transmission capacity, maintain voltage support, and ensure generating plant and transmission system stability. In May 2017, the TVA Board approved a \$300 million multi-year, strategic fiber initiative that will expand TVA's fiber capacity and improve the reliability and resiliency of the transmission system. The network expansion is designed to help meet the power system's growing need for bandwidth as well as accommodate the integration of new, distributed energy resources.

#### Weather and Seasonality

Weather affects both the demand for and the market prices of electricity. TVA's power system is generally a dual-peaking system in which the demand for electricity peaks during the summer and winter months to meet cooling and heating needs. TVA uses degree days to measure the impact of weather on its power operations. Degree days measure the extent to which average temperatures in the five largest cities in TVA's service area vary from 65 degrees Fahrenheit. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Results of Operations — Sales of Electricity.



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The summer of 2016 was the hottest and driest in the Tennessee Valley since 2010 - a trend that continued into the first six months of 2017. Rainfall in the Upper Basin of the Tennessee Valley was 101 percent of normal for 2017 and 103 percent of normal in 2016. Also, runoff was 79 percent of normal in 2017 and 104 percent of normal in 2016. Runoff is the amount of rainfall that is not absorbed by vegetation or the ground and actually reaches the rivers and reservoirs that TVA manages. TVA's conventional hydroelectric generation decreased 11 percent in 2017 as compared to 2016, and decreased eight percent in 2016 as compared to 2015. Conventional hydroelectric generation was approximately 82 percent of normal in 2017 and 93 percent of normal in 2016.

## Competition

TVA provides electricity in a service area that is largely free of competition from other electric power providers. This service area is defined primarily by provisions of law and long-term contracts. The fence limits the region in which TVA or LPCs which distribute TVA power may provide power. The anti-cherry-picking provision limits the ability of others to use the TVA transmission system for the purpose of serving customers within TVA's service area. State service territory laws limit unregulated third parties' ability to sell electricity to consumers. All TVA wholesale power contracts and many contracts between LPCs and their customers are requirements contracts. However, other utilities may use their own transmission lines to serve customers within TVA's service area, and third parties are able to avoid the restrictions on serving end-use customers by selling or leasing a customer generating assets rather than electricity. These threats underscore the need for TVA to strategically price its products and services and design rates to be competitive. There have also been some efforts in the past to erode the anti-cherry-picking provision, and the protection of the anti-cherry-picking provision could be limited and perhaps eliminated by congressional legislation at some time in the future.

TVA also faces competition in the form of emerging technologies. Improvements in energy efficiency technologies, smart technologies, and energy storage technologies may reduce the demand for centrally provided power. The growing interest by customers in generating their own power through distributed generation (including solar power) has the potential to lead to a reduction in the load served by TVA as well as cause TVA to re-evaluate how it operates the overall grid system to continue to provide highly reliable power at affordable rates. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Key Initiatives and Challenges — Distributed Energy Resources.

Finally, TVA and other utility companies are facing an evolving marketplace of increased competition driven by customer choice and behavior. As technology develops, consumers' demands for access to diverse products and services may increase, creating opportunities for growth with new products and services resulting from emerging technologies.

## Research and Development

TVA makes annual investments in science and technological innovation to help meet future business and operational challenges. Each year, TVA's annual research portfolio is updated based on a broad range of operational and industry drivers that help assess key technology gaps, performance issues, or other significant issues that should be addressed through research and development. Core research activities directly support optimization of TVA's generation and transmission assets, air and water quality, energy utilization, and distributed/clean energy integration.

In the area of energy utilization, TVA evaluates emerging energy efficiency and load management technologies for market and program readiness. TVA's efforts are directed towards demonstrating and validating the performance, reliability, and consumer acceptance of new efficiency technology as well as the value of energy efficiency and load management technologies for the consumer, the LPCs, and TVA.

TVA is also beginning the assessment of potential electrification programs that may improve resource utilization and reduce environmental impacts (especially in the transportation sector). TVA is continuing its evaluation of potential electric vehicle adoption strategies through coordination of activities with EPRI and industry stakeholders related to operational fleet requirements. The needs of LPCs to provide guidance on matters of plug-in electric vehicle grid integration and readiness for various transportation electrification technologies are also areas of focus.

Research in this area of electrification applications includes compatibility of charging stations to work efficiently with various types of electric vehicles, impact of charging stations on the power grid, refinement of power-system control processes to maximize energy efficiency, and development of smart charging strategies to maximize the potential of electricity to replace petroleum as the transportation fuel of choice.

TVA and its LPCs are engaged in several initiatives related to grid modernization, including research into technologies and applications with the potential to advance an intelligent transmission and distribution system. Smart meter technology has the potential to shift usage patterns away from peak demand times which could change costs significantly. Additionally, an intelligent transmission system would give TVA the ability to nearly instantaneously diagnose problems, make corrections, and engage transmission and generation resources quickly so that power would keep flowing. This could promote reduced emissions, lower energy costs, and add greater flexibility to accommodate the new consumer-generated sources under TVA's renewable energy programs. See Power Supply and Load Management Resources — Distributed Energy Resources.

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Finally, TVA is evaluating smaller, clean power sources that can be aggregated to provide power necessary to meet regular demand. Research efforts into these clean DER seek to understand the scope and impact of DER on operations and business economics and to develop strategies for adapting to the evolving electricity landscape in the Tennessee Valley. Of particular interest are investigations into the potential applications of battery storage and modeling existing and expected solar power deployments in the Tennessee Valley to evaluate the full extent of system impacts of those renewable resources. Initial economic analyses have been conducted to identify the value of DER (particularly photovoltaic solar generation) to both TVA and the LPC system. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Key Initiatives and Challenges — Distributed Energy Resources.

Investments in TVA's research portfolio are supported through partnership and collaboration with LPCs, EPRI and other research consortiums, the DOE and other federal agencies, national labs, peer utilities, universities, and industry vendors and participation in professional societies.

### Flood Control Activities

The Tennessee River watershed has one of the highest annual rainfall totals of any watershed in the United States, averaging 51 inches per year. During 2017, approximately 54 inches of rain fell in the Tennessee Valley. TVA manages the Tennessee River system in an integrated manner, balancing hydroelectric generation with navigation, flood damage reduction, water quality and supply, and recreation. TVA spills or releases excess water through its dams in order to reduce flood damage to the Tennessee Valley. TVA typically spills only when all available hydroelectric generating turbines are operating at full capacity and additional water still needs to be moved downstream.

### Environmental Stewardship Activities

TVA's mission includes managing the Tennessee River, its tributaries, and federal lands along the shoreline to provide, among other things, year-round navigation, flood damage reduction, affordable and reliable electricity, and, consistent with these primary purposes, recreational opportunities, adequate water supply, improved water quality, and natural resource protection. There are 49 dams that comprise TVA's integrated reservoir system. Each dam may also have ancillary structures used to support or assist the main dam's function. The reservoir system provides approximately 800 miles of commercially navigable waterways and also provides significant flood reduction benefits both within the Tennessee River system and downstream on the lower Ohio and Mississippi Rivers. The reservoir system also provides a water supply for residential and industrial customers, as well as cooling water for TVA's coal-fired plants, combined cycle plants, and nuclear power plants. TVA's Environmental Policy, which was adopted by the TVA Board in 2008, provides objectives for an integrated approach related to providing cleaner, reliable, and low-cost energy, supporting sustainable economic growth, and engaging in proactive environmental stewardship in a balanced and ecologically sound manner. The Environmental Policy provides additional direction in several environmental stewardship areas, including water resource protection and improvements, sustainable land use, and natural resource management.

TVA serves the people of the TVA region through the integrated management of the Tennessee River system and public lands, which includes approximately 11,000 miles of shoreline, 650,000 surface acres of reservoir water, and 293,000 acres of reservoir lands. TVA accomplishes this mission and supports the objectives of the TVA Environmental Policy through implementation of its natural resources stewardship strategy. Within this strategy, TVA confirms a desire to remain agile, balance competing demands, and be a catalyst for collaboration in order to protect and enhance biological, cultural, and water resources as well as create and sustain destinations for recreation and opportunities for learning and research. As part of the strategy, TVA will also assist water-based community development with technical support, land agreements, and permitting using planning, clear regulations, meaningful guidelines, and consistent enforcement. Additional guidance for carrying out many of TVA's essential stewardship responsibilities is provided in TVA's Natural Resource Plan. The Natural Resource Plan will be reviewed and updated

as needed.

#### Economic Development Activities

Since its creation in 1933, TVA has promoted the development of the Tennessee Valley. Economic development, along with energy production and environmental stewardship, is one of the primary statutory purposes of TVA. TVA works with its LPCs, regional, state, and local agencies, and communities to showcase the advantages available to businesses locating or expanding in TVA's service area. TVA's primary economic development goals are to recruit companies to locate in the Tennessee Valley, encourage expansion of existing business and industry that provide quality jobs, and assist communities in the Tennessee Valley with economic growth opportunities. TVA seeks to meet these goals through a combination of initiatives and partnerships designed to provide financial assistance, technical services, industry expertise, and site-selection assistance to new and existing businesses.

Economic development programs developed by TVA include those which focus on supporting all communities including rural and economically distressed communities across the Tennessee Valley by working in close partnership with other federal and state organizations. TVA also jointly offers incentive programs with participating LPCs. These programs offer competitive incentives to existing and potential power customers in certain business sectors that make multi-year commitments to invest in the Tennessee Valley. In addition to financial support for these programs, TVA offers resources to communities and economic

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developers in the areas of recruitment, leadership development, industrial product preparedness (sites and buildings), planning, and project assistance.

TVA's economic development efforts helped recruit or expand over 200 companies into the TVA service area during 2017. These companies announced capital investments of over \$8.3 billion and the expected creation and/or retention of over 70,000 jobs.

## Regulation

### Congress

TVA exists pursuant to legislation enacted by Congress and carries on its operations in accordance with this legislation. Congress can enact legislation expanding or reducing TVA's activities, change TVA's structure, and even eliminate TVA. Congress can also enact legislation requiring the sale of some or all of the assets TVA operates or reduce the United States's ownership in TVA. To allow TVA to operate more flexibly than a traditional government agency, Congress exempted TVA from all or parts of certain general federal laws that govern other agencies, such as federal labor relations laws and the laws related to the hiring of federal employees, the procurement of supplies and services, and the acquisition of land. Other federal laws enacted since the creation of TVA that are applicable to other agencies have been made applicable to TVA, including those related to paying employees overtime and protecting the environment, cultural resources, and civil rights.

### Securities and Exchange Commission

Section 37 of the Securities Exchange Act of 1934 (the "Exchange Act") requires TVA to file with the SEC such periodic, current, and supplementary information, documents, and reports as would be required pursuant to Section 13 of the Exchange Act if TVA were an issuer of a security registered pursuant to Section 12 of the Exchange Act. Section 37 of the Exchange Act exempts TVA from complying with Section 10A(m)(3) of the Exchange Act, which requires each member of a listed issuer's audit committee to be an independent member of the board of directors of the issuer. Since TVA is an agency and instrumentality of the United States, securities issued or guaranteed by TVA are "exempted securities" under the Securities Act of 1933, as amended (the "Securities Act"), and may be offered and sold without registration under the Securities Act. In addition, securities issued or guaranteed by TVA are "exempted securities" and "government securities" under the Exchange Act. TVA is also exempt from Sections 14(a)-(d) and 14(f)-(h) of the Exchange Act (which address proxy solicitations) insofar as those sections relate to securities issued by TVA, and transactions in TVA securities are exempt from rules governing tender offers under Regulation 14E of the Exchange Act. Also, since TVA securities are exempted securities under the Securities Act, TVA is exempt from the Trust Indenture Act of 1939 insofar as it relates to securities issued by TVA, and no independent trustee is required for these securities.

### Federal Energy Regulatory Commission

Under the FPA, TVA is not a "public utility," a term which primarily refers to investor-owned utilities. Therefore, TVA is not subject to the full jurisdiction that FERC exercises over public utilities under the FPA. TVA is, however, an "electric utility" and a "transmitting utility" as defined in the FPA and, thus, is directly subject to certain aspects of FERC's jurisdiction.

Under Section 215 of the FPA, TVA must comply with certain standards designed to maintain transmission system reliability. These standards are approved by FERC and enforced by NERC.

Under Section 210 of the FPA, TVA can be ordered to interconnect its transmission facilities with the electrical facilities of independent generators and of other electric utilities that meet certain requirements. It must be found that the requested interconnection is in the public interest and would encourage conservation of energy or capital, optimize efficiency of facilities or resources, or improve reliability. The requirements of Section 212 of the FPA concerning the terms and conditions of interconnection, including reimbursement of costs, must also be met.

Under Section 211 of the FPA, TVA can be ordered to transmit wholesale power provided that the order (1) does not impair the reliability of the TVA or surrounding systems and (2) meets the applicable requirements of Section 212 concerning terms, conditions, and rates for service, as well as the anti-cherry-picking provision of Section 212, which precludes FERC from ordering TVA to wheel another supplier's power if the power would be consumed within TVA's defined service territory. Under Section 211A of the FPA, TVA is subject to FERC review of the transmission rates and the terms and conditions of service that TVA provides. The purpose of this review is to ensure comparability of treatment of such service with TVA's own use of its transmission system and that the terms and conditions of service are not unduly discriminatory or preferential.

Sections 221 and 222 of the FPA, applicable to all market participants, including TVA, prohibit (1) reporting false information on the price of electricity sold at wholesale or the availability of transmission capacity to a federal agency with intent to fraudulently affect the data being compiled by the agency and (2) using manipulative or deceptive devices or contrivances in connection with the purchase or sale of power or transmission services subject to FERC's jurisdiction.

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Section 206(e) of the FPA provides FERC with authority to order refunds of excessive prices on short-term sales (transactions lasting 31 days or less) by all market participants, including TVA, in price gouging situations if such sales are through an independent system operator or regional transmission organization under a FERC-approved tariff.

Section 220 of the FPA provides FERC with authority to issue regulations requiring the reporting, on a timely basis, of information about the availability and prices of wholesale power and transmission service by all market participants, including TVA.

Under Sections 306 and 307 of the FPA, FERC may investigate electric industry practices, including TVA's operations previously mentioned that are subject to FERC's jurisdiction.

Under Sections 316 and 316A of the FPA, FERC has authority to impose civil penalties of up to \$1 million per day for each violation on entities subject to the provisions of Part II of the FPA, which includes the above provisions applicable to TVA. Criminal penalties may also result from such violations.

Finally, while not required to do so, TVA has elected to implement various FERC orders and regulations pertaining to public utilities on a voluntary basis to the extent that they are consistent with TVA's obligations under the TVA Act.

### Nuclear Regulatory Commission

TVA operates its nuclear facilities in a highly regulated environment and is subject to the oversight of the NRC, an independent federal agency which sets the rules that users of radioactive materials must follow. The NRC has broad authority to impose requirements relating to the licensing, operation, and decommissioning of nuclear generating facilities. In addition, if TVA fails to comply with requirements promulgated by the NRC, the NRC has the authority to impose fines, shut down units, or modify, suspend, or revoke TVA's operating licenses.

### Environmental Protection Agency

TVA is subject to regulation by the EPA in a variety of areas, including air quality control, water quality control, and management and disposal of solid and hazardous wastes. See Environmental Matters below.

### States

The Supremacy Clause of the U.S. Constitution prohibits states, without congressional consent, from regulating the manner in which the federal government conducts its activities. As a federal agency, TVA is exempt from regulation, control, and taxation by states except in certain areas where Congress has clearly made TVA subject to state regulation. See Environmental Matters below.

### Other Federal Entities

TVA's activities and records are also subject to review to varying degrees by other federal entities, including the Government Accountability Office and the Office of Management and Budget ("OMB"). There is also an Office of the Inspector General which reviews TVA's activities and records.

### Taxation and Tax Equivalentents

TVA is not subject to federal income taxation. In addition, neither TVA nor its property, franchises, or income is subject to taxation by states or their subdivisions. Section 13 of the TVA Act, however, does require TVA to make tax equivalent payments to states and counties in which TVA conducts power operations or in which TVA has

acquired properties previously subject to state and local taxation. The total amount of these payments is five percent of gross revenues from the sale of power during the preceding year excluding sales or deliveries to other federal agencies and off-system sales with other utilities, with a provision for minimum payments under certain circumstances. Except for certain direct payments TVA is required to make to counties, distribution of tax equivalent payments within a state is determined by individual state legislation.

#### Environmental Matters

TVA's activities, particularly its power generation activities, are subject to comprehensive regulation under environmental laws and regulations relating to air pollution, water pollution, and management and disposal of solid and hazardous wastes, among other issues. Emissions from all TVA-owned and operated units (including small combustion turbine units of less than 25 MWs whose emissions are not required to be reported to the EPA) have been reduced from historic peaks. Emissions of nitrogen oxide ("NO<sub>x</sub>") have been reduced by 92 percent below peak 1995 levels and emissions of sulfur dioxide ("SO<sub>2</sub>") have been reduced by 97 percent below 1977 levels through CY 2016. For CY 2016, TVA's emission of carbon dioxide ("CO<sub>2</sub>") from its sources was 69 million tons, a 34 percent reduction from 2005 levels. This includes 1,829 tons from units rated at less than 25 MWs whose emissions are not required to be reported to the EPA. To remain consistent and provide clear



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information and to align with the EPA's reporting requirements, TVA intends to continue to report CQ emissions on a calendar year basis.

### Clean Air Act

The CAA establishes a comprehensive program to protect and improve the nation's air quality and control sources of air pollution. The major CAA programs that affect TVA's power generation activities are described below.

**National Ambient Air Quality Standards.** The CAA requires the EPA to set National Ambient Air Quality Standards ("NAAQS") for certain air pollutants. The EPA has done this for ozone, particulate matter ("PM"), SO<sub>2</sub>, nitrogen dioxide ("NO<sub>2</sub>"), carbon monoxide, and lead. Over the years, the EPA has made the NAAQS more stringent. Each state must develop a plan to be approved by the EPA for achieving and maintaining NAAQS within its borders. These plans impose limits on emissions from pollution sources, including TVA fossil fuel-fired plants. Areas meeting a NAAQS are designated as attainment areas. Areas not meeting a NAAQS are designated as non-attainment areas, and more stringent requirements apply in those areas, including stricter controls on industrial facilities and more complicated permitting processes. TVA fossil fuel-fired plants can be impacted by these requirements. All TVA generating units are located in areas designated as in attainment with NAAQS. EPA designated the Knoxville area as attainment with the 1997 annual fine PM NAAQS effective August 19, 2017, and in attainment with the 2006 24-hour fine PM NAAQS effective September 27, 2017.

All areas of the Tennessee Valley meet the 2008 ozone NAAQS. On October 1, 2015, the EPA issued a final rule to revise the ozone NAAQS to 70 parts per billion ("ppb") from the 2008 standard of 75 ppb. On November 6, 2017, the EPA Administrator signed a final rule establishing initial air quality designations for most areas in the United States with respect to the 2015 ozone standard. All areas within the Tennessee Valley were designated by the EPA as Attainment/Unclassifiable for the 70 ppb standard.

On March 2, 2015, the United States District Court for the Northern District of California approved a consent decree between the EPA and certain environmental petitioners in *Sierra Club v. McCarthy*. The consent decree set a schedule for the EPA to complete nationwide area designations with respect to the 2010 1-Hour SO<sub>2</sub> NAAQS based on monitored air quality levels and SO<sub>2</sub> source emission rates and amounts. Air quality modeling was required in 2016 to determine designation of areas around five TVA coal-fired plants. No areas around any TVA generating units were designated non-attainment. Lower SO<sub>2</sub> permit limits well within the capability of existing control equipment are in place for Gallatin. The impacted Paradise coal Units 1 and 2 have been retired.

**Cross-State Air Pollution Rule.** The EPA issued the Cross-State Air Pollution Rule ("CSAPR") in July 2011, requiring several states in the eastern United States to improve air quality relative to the 1997 ozone NAAQS and the 1997 and 2006 fine particle NAAQS by reducing power plant emissions that contribute to pollution in other states. CSAPR replaced the Clean Air Interstate Rule ("CAIR"), a similar but less stringent rule. The U.S. Court of Appeals for the District of Columbia Circuit ("D.C. Circuit") vacated CSAPR before implementation began, but the D.C. Circuit's vacatur was reversed by the U.S. Supreme Court in April 2014. Upon further proceedings on remand, the D.C. Circuit granted the EPA's motion to restore CSAPR but delayed the compliance deadlines by three years. Under the revised compliance deadlines, Phase I emission reductions in SO<sub>2</sub> and NO<sub>x</sub> became effective on January 1, 2015, and were followed by Phase II reductions on May 1, 2017. TVA complies with CSAPR aided by significant prior reductions in SO<sub>2</sub> and NO<sub>x</sub> emissions and planned future reductions.

On September 7, 2016, the EPA issued an update to CSAPR to address cross-state pollution relative to the 2008 ozone NAAQS, and also to respond to a July 2015 remand of the CSAPR emission budgets for certain states by the D.C. Circuit. In this update, the EPA implemented more stringent Phase II reductions for NO<sub>x</sub> that become effective on May 1, 2017. TVA has not had and does not currently anticipate significant changes to its operations based on the

September 7, 2016, EPA Cross-State Air Pollution Update Rule ("CSAPR Update Rule").

Mercury and Air Toxics Standards for Electric Utility Units. The D.C. Circuit upheld the Mercury and Air Toxics Standards ("MATS") rule on April 15, 2014. In June 2015, however, the United States Supreme Court ("Supreme Court") left the rule in place but remanded it back to the EPA, finding that the EPA was required to consider cost before deciding whether the regulation of hazardous air pollutants emitted from steam electric utilities was appropriate and necessary. In response to the Supreme Court's remand, the EPA published the final Supplemental Finding That It is Appropriate and Necessary to Regulate Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units in April 2016. Several groups have filed petitions with the D.C. Circuit challenging the EPA's determination. The MATS rule remains in effect while these challenges are pending, and TVA's MATS compliance strategy will not be affected by these challenges. Also in April 2016, in response to a request from TVA, the EPA issued an administrative order under the CAA to allow operation of Paradise coal-fired Units 1 and 2 for a year beyond the original MATS compliance date of April 15, 2016. The additional year allowed these units to continue to operate while the new natural gas-fired generation facility being built at the site became operational. The natural gas-fired generation facility reached commercial operation in the spring of 2017, and Paradise coal-fired Units 1 and 2 have been retired.

The Environmental Agreements. See Note 21 — Legal Proceedings — Environmental Agreements for a discussion of the Environmental Agreements, which discussion is incorporated herein by reference.

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Acid Rain Program. Congress established the Acid Rain Program to achieve reductions in emissions of SO<sub>2</sub> and NO<sub>x</sub>, the primary pollutants implicated in the formation of acid rain. The program includes a cap-and-trade emission reduction program for SO<sub>2</sub> emissions from power plants. TVA continues to reduce SO<sub>2</sub> and NO<sub>x</sub> emissions from its coal-fired plants, and the SO<sub>2</sub> allowances allocated to TVA under the Acid Rain Program are sufficient to cover the operation of its coal-fired plants. In the TVA service area, the limitations imposed on NO<sub>x</sub> emissions by the CSAPR program are more stringent than the Acid Rain Program. Therefore, TVA forecasts that the Acid Rain Program will have no impact on TVA other than administrative reporting.

Regional Haze Program. In June 2005, the EPA issued the Clean Air Visibility Rule, amending its CY 1999 regional haze rule, which had established timelines for states to improve visibility in national parks and wilderness areas throughout the United States with a target of reaching no anthropogenic impacts on visibility in these areas by 2064. One requirement under the amended rule is that certain types of older existing sources are required to install best available retrofit technology. No additional controls or lower operating limits are required for any TVA units to meet best available retrofit technology requirements. On January 10, 2017, the EPA published the final rule "Protection of Visibility: Amendments to Requirements for State Plans." The rule would change some of the requirements for Regional Haze State Implementation Plans ("Regional Haze SIPs"). TVA does not expect significant impacts to its operations from these changes, but specific impacts are not possible to predict until the rule is final and future Regional Haze SIPs are submitted to the EPA and approved.

Opacity. Opacity, or visible emissions, measures the denseness (or color) of power plant plumes and has traditionally been used by states as a means of monitoring good maintenance and operation of particulate control equipment. Under some conditions, retrofitting a unit with additional equipment to better control SO<sub>2</sub> and NO<sub>x</sub> emissions can adversely affect opacity performance, and TVA and other utilities are addressing this issue. The evaluation of utilities' compliance with opacity requirements is coming under increased scrutiny, especially during periods of startup, shutdown, and malfunction. State implementation plans developed under the CAA typically exclude periods of startup, shutdowns, and malfunctions, but on June 12, 2015, the EPA finalized a rule to eliminate such exclusions. The EPA rule required states to modify their implementation plans by November 12, 2016. Kentucky, Tennessee, and Mississippi submitted implementation plans, but Alabama has not. Environmental petitioners and several states filed petitions for judicial review of the EPA final rule before the D.C. Circuit. On April 24, 2017, the D.C. Circuit, at the request of the new EPA Administrator, ordered this litigation to be held in abeyance pending the EPA's review to determine whether to reconsider all or part of the rule. TVA does not expect significant impacts from these rule changes.

On October 1, 2017, the Kentucky Division for Air Quality published proposed revised startup/shutdown regulations for new and existing indirect heat exchangers. TVA's Shawnee and Paradise plants have boilers which will be subject to these rules when finalized and incorporated into their air permits.

Petition to Expand the Ozone Transport Region. On December 9, 2013, eight of the twelve states that make up the Ozone Transport Region ("OTR") submitted a petition, pursuant to section 176A(a) of the CAA, requesting the EPA to add nine states, including Kentucky and Tennessee, to the OTR. The EPA failed to act on the petition within the 180-day period provided under the CAA. On October 6, 2016, six of the eight states filing the petition sued the EPA in the U.S. District Court for the Southern District of New York, asking the court to require the EPA to act on the petition by a date certain. In response to this lawsuit, the EPA published, on January 19, 2017, a notice in the Federal Register proposing to deny the petition on the basis that the CAA provides other options, such as the use of the "good neighbor provision" in Section 110, and Section 126, to address the impact of interstate air pollution. The EPA also states that its CSAPR Update Rule is a significant step to control states' emission reduction obligations under Section 110 to meet the 2008 ozone NAAQS. The comment period on this proposal closed on May 15, 2017. On October 27, 2017, the EPA denied the petition.

Kentucky Federal Implementation Plan to Address Downwind Ozone Impacts. On June 2, 2016, the EPA missed its deadline to promulgate a federal implementation plan ("FIP") for Kentucky to address its obligation for ozone emissions originating in Kentucky that might be transported to New York and other downwind states and was sued by the Sierra Club for missing the deadline. On May 23, 2017, the U.S. District Court for the Northern District of California ruled that the EPA must promulgate the Kentucky FIP by June 30, 2018, sooner than the EPA had proposed. Until the EPA develops and releases a proposed FIP, expected impacts to TVA are not possible to determine. Kentucky utility unit emissions that contribute to ozone are already limited by the CSAPR Update Rule and are declining. Further reductions may not be required by the FIP.

Maryland Petition to Address Impacts from Upwind Electric Generating Units. On September 27, 2017, the State of Maryland filed a lawsuit against the EPA for failing to act within 60 days on Maryland's petition under Section 126 of the Clean Air Act to address ozone impacts on Maryland from the NO<sub>x</sub> emissions of 36 electric generating units, including TVA's Paradise coal-fired Unit 3. On October 4, 2017, a group of seven environmental advocacy groups filed a similar complaint against the EPA. At issue in Maryland's Section 126 petition are alleged excessive NO<sub>x</sub> emissions from the 36 electric generating units as a result of SCR units not being operated continuously. Paradise coal-fired Unit 3 is equipped with a SCR unit that TVA continuously operates to the greatest extent technically practicable in order to minimize NO<sub>x</sub> emissions. Until the EPA responds to Maryland's Section 126 petition, it is not possible to determine the potential impacts of the petition on TVA.

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### Climate Change

Regulation. On August 3, 2015, the EPA issued the Clean Power Plan ("CPP"), a rule under section 111(d) of the CAA, to reduce carbon emissions from existing power plants burning fossil fuels. The Clean Power Plan establishes state-specific emission goals to lower CO<sub>2</sub> emissions from power plants, targeting a 32 percent nationwide reduction in CO<sub>2</sub> emissions from 2005 levels by 2030. The EPA established an "interim goal" that states must meet on average over the eight-year period from 2022-2029 and a "final goal" that states must meet in 2030 and thereafter based on a two-year average. States were required to submit to the EPA final plans, or "initial plans" with a request for an extension, by September 6, 2016. States that received an extension are required to submit final plans by September 6, 2018.

On February 9, 2016, the U.S. Supreme Court granted a stay of the Clean Power Plan. The stay will remain in place while the D.C. Circuit reviews the rule and during any subsequent appeals to the U.S. Supreme Court that may occur after the D.C. Circuit issues its opinion. The stay means that the Clean Power Plan has no legal effect while courts are reviewing the rule to determine whether it is lawful. The D.C. Circuit, sitting en banc, heard oral arguments on the Clean Power Plan on September 27, 2016.

On April 28, 2017, the D.C. Circuit issued an order, at the request of the EPA Administrator, holding the case in abeyance pending the EPA's review of the Clean Power Plan to determine whether to repeal or modify it. On October 10, 2017, the EPA published a notice in the Federal Register proposing to repeal the Clean Power Plan. The notice provides that the EPA has not determined whether it will promulgate a Section 111(d) rule and, if it will do so, when it will do so and what form the rule will take.

On August 3, 2015, the EPA also finalized New Source Performance Standards for carbon emissions from new, modified, and reconstructed power plants. These standards apply to two types of fossil fuel-fired sources: (1) stationary combustion turbines, generally firing natural gas, and (2) electric utility steam generating units, generally firing coal. These standards reflect the degree of emission limitation achievable through the application of the best system of emission reduction ("BSER") that the EPA has determined to be adequately demonstrated for each type of source. These standards apply to the new TVA combined-cycle plants at the Paradise site, which is already operating, and at Allen, which is under construction. The design of these plants enables them to comply with the new standards.

Executive Actions. To strengthen the Administration's efforts to increase government-wide energy efficiency and sustainability and implement goals in the President's June 2013 Climate Action Plan, President Obama issued a memorandum on December 5, 2013, requiring that at least 20 percent of the total amount of energy consumed by each federal agency in any fiscal year, starting in 2020, be renewable energy. TVA is on track to achieve the aforementioned 2020 goal of the Presidential Memorandum. In addition, on March 25, 2015, President Obama issued Executive Order ("EO") 13693, which directed each federal agency to ensure that, starting in 2025 and continuing each year thereafter, no less than 30 percent of the total amount of building electric energy is renewable electric energy. TVA has submitted a climate adaptation plan as required by EO 13693, and TVA is aligning the federal climate adaptation plan with climate resiliency planning. The Executive Order also established a clean energy target for federal agencies to achieve 25 percent of total building energy from renewable plus thermal energy by 2025.

On April 21, 2015, the Obama Administration released the initial installment of its Quadrennial Energy Review ("QER"). In the QER, the Obama Administration announced that the DOE is creating a partnership with 17 energy companies, including TVA, to improve infrastructure resilience against extreme weather and climate change. The first installment of the QER was published in April 2015, and the second installment was published in January 2017.

On March 28, 2017, President Trump issued EO 13783, "Promoting Energy Independence and Economic Growth." The EO reversed or altered many actions taken by the federal government in the last four years to address climate change

and mandates that federal agencies review existing regulations and actions that potentially burden energy development and use. Several EOs, policy statements, and reports that established climate change objectives were rescinded or revoked. The EPA is required to review and, if appropriate, suspend or revise specific rules including the Clean Power Plan. The EPA, through the Department of Justice, has already requested the D.C. Circuit to hold all litigation relating to these rules in abeyance pending completion of the EPA's review of the rules. The EO does not cover all relevant policies, orders, and regulations related to climate change and did not rescind EO 13693, "Planning for Federal Sustainability in the Next Decade." EO 13783 also did not mandate that the EPA reconsider its finding under the CAA that greenhouse gas emissions cause climate change and therefore endanger public health and the environment.

While EO 13783 requires review of all agency actions that potentially burden the safe, efficient development of domestic energy resources, the final specific requirements and impacts from implementation of this EO are not possible to predict at this time. It is likely that there will be some delay in the development of future greenhouse gas ("GHG") reduction requirements. TVA's historical and projected GHG reductions are expected to meet the requirements of the currently stayed Clean Power Plan, and TVA's new generating units are designed to meet the applicable GHG requirements for new units.

International Accords. On September 3, 2016, the United States formally accepted the Paris agreement. The agreement met the threshold of at least 55 countries that account for at least 55 percent of global greenhouse gas emission and

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formally entered into force on November 4, 2016. The durability of the Paris agreement commitments is uncertain after the President's announcement on June 1, 2017, that the U.S. would withdraw from the agreement. Under the terms of the agreement, the earliest possible effective date for withdrawal by the U.S. is November 4, 2020, four years after the agreement came into effect. Future U.S. regulation on greenhouse gases designed to meet the Paris agreement goals could impact TVA in ways that cannot be determined at this time.

**Litigation.** In addition to legislative activity, climate change issues have been the subject of a number of lawsuits, including lawsuits against TVA. See Note 21 for additional information.

**Indirect Consequences of Regulation or Business Trends.** Legal, technological, political, and scientific developments regarding climate change may create new opportunities and risks. The potential indirect consequences could include an increase or decrease in electricity demand, increased demand for generation from alternative energy sources, and subsequent impacts to business reputation and public opinion. See Power Supply and Load Management Resources above.

**Physical Impacts of Climate Change.** TVA manages the potential effects of climate change on its mission, programs, and operations within its environmental management processes. The goal of the adaptation planning process is to ensure TVA continues to achieve its mission and program goals and to operate in a secure, effective, and efficient manner in a changing climate by integrating climate change adaptation efforts in coordination with other state and local partners, tribal governments and private stakeholders. TVA's Climate Change Adaptation Plan was last updated in July 2017.

**Actions Taken by TVA to Reduce GHG Emissions.** TVA has reduced GHG emissions from both its generation stations and its operations. As discussed earlier in this Item 1, Business, recent TVA Board actions have focused on TVA's plan to balance its coal-fired generation by increasing its nuclear capacity, modernizing its hydroelectric generation system, increasing natural gas-fired generation, installing emission control equipment on certain of its coal-fired units, increasing its purchases of renewable energy, and investing in energy efficiency initiatives to reduce energy use in the Tennessee Valley. Additionally, TVA has invested to reduce energy use in its operations. The combination of more stringent environmental regulations, lower natural gas prices, and lower demand for energy across the Tennessee Valley has reduced the utilization of coal-fired generation. These factors have resulted in lower CO<sub>2</sub> emissions from the TVA system.

### Renewable/Clean Energy Standards

Twenty-nine states and the District of Columbia have established enforceable or mandatory requirements for electric utilities to generate a certain amount of electricity from renewable sources. One state within the TVA service area, North Carolina, has a mandatory renewable standard that, while not applying directly to TVA, does apply to TVA's LPCs serving retail customers in that state. TVA's policy is to provide compliance assistance to any distributor of TVA power, and TVA is providing assistance to the covered LPCs that sell TVA power in North Carolina. Likewise, the Mississippi Public Service Commission adopted an energy efficiency rule applying to electric and natural gas providers in the state, and TVA is supplying information on participation in ERS efforts to support the covered Mississippi LPCs.

### Water Quality Control Developments

**Cooling Water Intake Structures.** On May 19, 2014, the EPA released a final rule under Section 316(b) of the Clean Water Act relating to cooling water intake structures ("CWIS") for existing power generating facilities. The rule requires changes in cooling water intake structures used to cool the vast majority of coal, gas, and nuclear steam-electric generating plants and a wide range of manufacturing and industrial facilities in the U.S. The final rule

requires cooling water intake structures to reflect the best technology available for minimizing adverse environmental impacts, primarily by reducing the amount of fish and shellfish that are impinged or entrained at a cooling water intake structure. These new requirements will potentially affect a number of TVA's fossil- and nuclear-fueled facilities and will likely require capital upgrades to ensure compliance. Most TVA facilities are projected to require retrofit of CWIS with "fish-friendly" screens and fish return systems to achieve compliance with the new rule. The rule is being implemented through permits issued under the National Pollutant Discharge Elimination System ("NPDES") in Section 402 of the Clean Water Act. State agencies administer the NPDES permit program in most states including those in which TVA's facilities are located. In addition, the responsible state agencies must provide all permit applications to the U.S. Fish & Wildlife Service for a 60-day review prior to public notice and an opportunity to comment during the public notice. As a result, the permit may include requirements for additional studies of threatened and endangered species arising from U.S. Fish & Wildlife Service comments and may require additional measures be taken to protect threatened and endangered species and critical habitats directly or indirectly related to the plant cooling water intake. TVA's review of the final rule indicates that the rule offers adequate flexibility for cost-effective compliance. The required compliance timeframe is linked to plant specific NPDES permit renewal cycles (i.e., technology retrofits), and compliance is expected to be in the 2022-2024 timeframe.

Hydrothermal Discharges. The EPA and many states continue to focus regulatory attention on potential effects of hydrothermal discharges. Many TVA plants have variances from thermal standards under Section 316(a) of the Clean Water Act that are subject to review as NPDES permits are renewed. Specific data requirements in the future will be determined based on negotiations between TVA and regulators. If plant thermal limits are made more stringent, TVA may have to install cooling towers at some of its plants and operate installed cooling towers more often. This could result in a substantial cost to TVA.



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Steam-Electric Effluent Guidelines. On November 3, 2015, the EPA published a final rule to revise the existing steam-electric effluent limitation guidelines ("ELGs") that updates the existing technology-based water discharge limitations for power plants nationwide. The new ELGs establish more stringent performance standards for existing and new sources that will require power plants that generate more than 50 MW to regulate discharges of toxic pollutants from seven primary wastewater streams. The primary impact for TVA is on the operation of existing and any potential new coal-fired generation facilities. The rule has the potential to impact long-term investment decisions being made relative to the long-term compliance and operability of TVA coal-fired units. Compliance with new requirements is required in the 2018-2023 timeframe and will necessitate major upgrades to wastewater treatment systems at all coal-fired plants. Dry fly ash handling is mandated by the rule. The rule also requires either dry bottom ash handling systems or "no discharge" recycle of bottom ash transport waters. In addition, new technology-based limits on flue gas desulfurization wastewater require primary physical or chemical treatment and secondary biological treatment to meet extremely low limits for arsenic, mercury, and selenium. On April 12, 2017, in response to Petitions for Reconsideration by the Utility Water Act Group and the Small Business Administration, the EPA Administrator announced his decision to reconsider the ELG rule. The EPA also proposed a rule to postpone the rule's compliance deadlines pending the EPA's reconsideration of the rule.

On August 11, 2017, the new EPA Administrator announced his decision to conduct a rulemaking to potentially revise the new, more stringent effluent limitations that apply to bottom ash transport water and flue gas desulfurization ("FGD") wastewater in the 2015 rule. A legal challenge of the rule is currently pending before the U.S. Court of Appeals for the Fifth Circuit. At the EPA's request, the court on August 22, 2017, entered an order severing and holding in abeyance the litigation related to the portions of the 2015 rule concerning bottom ash transport water, FGD wastewater, and gasification wastewater (which is not applicable to TVA) pending further agency action. Thus, the litigation is indefinitely on hold as to the bottom ash transport water and FGD wastewater claims until the EPA's further rulemaking has concluded. The litigation will continue as to the other claims.

On September 18, 2017, the EPA published a final rule postponing certain compliance/applicability dates to provide the EPA time to review and revise, as necessary, the new and stringent ELGs previously established for FGD wastewater and bottom ash transport water. The EPA pushed back the compliance dates for these two wastestreams from the 2018-2023 timeframe to 2020-2023. Other requirements and applicability dates of the rule for fly ash transport water, flue gas mercury control wastewater, and gasification wastewater remain in effect. As a result of these developments, it is not possible to predict the changes in the rule and TVA's associated expenditures to attain compliance.

With regard to its Cumberland Fossil Plant ("Cumberland"), TVA contends the ELG rulemaking did not appropriately consider available data that could affect these national limits as they applied at Cumberland given its unique "once-through" scrubber design. TVA has been working with the State of Tennessee and the EPA in an effort to address this issue. Compliance with the rule at Cumberland without modification to address the unique design could cause TVA to incur disproportionately high costs at Cumberland or experience other operational outcomes which TVA cannot predict at this time. The EPA's reconsideration of the 2015 rule is likely to impact this issue at Cumberland and could result in TVA's request needing revision or being unnecessary.

Other Clean Water Act Requirements. As is the case in other industrial sectors, TVA and other utilities are also facing more stringent requirements related to the protection of wetlands, reductions in storm water impacts from construction activities, new water quality criteria for nutrients and other pollutants, new wastewater analytical methods, and regulation of pesticide discharges.

Cleanup of Solid and Hazardous Wastes

Liability for releases and cleanup of hazardous substances is imposed under the federal Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), and other federal and parallel state statutes. In a manner similar to many other industries and power systems, TVA has generated or used hazardous substances over the years.

**TVA Sites.** TVA operations at some of its facilities have resulted in contamination that TVA is addressing including at TVA's Environmental Research Center ("ERC") at Muscle Shoals, Alabama. At September 30, 2017, TVA's estimated liability for cleanup and similar environmental work for those sites for which sufficient information was available to develop a cost estimate is approximately \$7 million and was included in Accounts payable and accrued liabilities and Other long-term liabilities on the consolidated balance sheet. In addition, the ERC has an active groundwater monitoring program as part of a Resource Conservation and Recovery Act ("RCRA") Corrective Action Permit.

**Non-TVA Sites.** TVA is aware of alleged hazardous-substance releases at certain non-TVA areas for which it may have some liability. See Note 21 — Contingencies — Environmental Matters.

**Coal Combustion Residuals.** The EPA published its final rule governing CCRs on April 17, 2015. The rule regulates CCRs as nonhazardous waste under Subtitle D of the RCRA. While states may adopt the rule's requirements into their regulatory programs, the rule does not require states to adopt the requirements. Although the rule became effective October 19, 2015, certain provisions have later effective dates. TVA's review of the final rule indicates that the rule offers adequate flexibility for compliance. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Key

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Initiatives and Challenges — Generation Resources — Coal Combustion Residual Facilities for a discussion of the impact on TVA's operations, including the cost and timing estimates of related projects.

On December 16, 2016, President Obama signed the Water Infrastructure Improvements for the Nation Act, which provides a path to CCR regulation implementation through state or federal-based permitting as an alternative to self implementation and enforcement through citizen suits in federal courts. Pending adoption of state permitting programs in states in TVA's service area, TVA does not anticipate any impact on the design or implementation timeframe for TVA's ongoing CCR activities at this time.

In August 2015, the Tennessee Department of Environment and Conservation ("TDEC") issued an order that (1) allowed TDEC to oversee TVA's implementation of the EPA's CCR rule and (2) required TVA to assess CCR contamination risks at seven of TVA's eight coal-fired plants in Tennessee and to remediate any unacceptable risks. The TDEC order does not allege that TVA is violating any CCR regulatory requirements nor does it assess TVA penalties. The TDEC order sets out an iterative process through which TVA and TDEC will identify and evaluate any CCR contamination risks and, if necessary, respond to such risks.

On August 4, 2017, the U.S. District Court for the Middle District of Tennessee ordered TVA to excavate the CCR materials from its CCR facilities at Gallatin and move them to a lined facility. See Note 8 — Background — Lawsuit Brought by TDEC and Lawsuit Brought by TSRA and TCWN and Note 21 — Legal Proceedings — Cases Involving Gallatin Fossil Plant CCR Facilities.

In May 2017, industry petitioners asked the EPA to reconsider the CCR rule and to incorporate new flexibility provided by the WIIN Act – specifically authority to make site-specific, risk-based decisions on implementing the federal criteria and to postpone upcoming regulatory deadlines during the new rulemaking. The EPA had previously agreed through settlement to revisit several elements of the CCR rule, so it will already be re-opening the rule. On September 14, 2017, the EPA announced that it plans to address the request to revisit key parts of its 2015 CCR rule. In addition, on September 18, 2017, the EPA filed a motion to hold the CCR litigation in abeyance and to postpone oral argument in the case while it reconsiders the CCR rule. The D.C. Circuit denied the EPA's motion and has rescheduled oral argument on litigation over the 2015 rule for November 20, 2017. In addition, the EPA has been directed to file by November 15, 2017, a status report specifying which provisions of the CCR rule are, or are likely to be, subject to reconsideration and specifying a rulemaking timeline. As a result of these developments, it is not possible to predict changes to the CCR rule and potential impacts on TVA.

Groundwater Contamination. Environmental groups and state regulatory agencies are increasing their attention on alleged groundwater contamination associated with CCR management activities. Seven of TVA's coal-fired plants are in some level of state regulatory groundwater assessment. Four of those plants (Colbert, Gallatin, Cumberland, and Shawnee) have investigations beyond monitoring and reporting. Five of those (Gallatin, Shawnee, Paradise, Johnsonville, and Widows Creek) have groundwater remediation monitoring with state regulatory involvement. As a result of these assessments and increased attention, TVA may have to change how it manages CCRs at some of its plants, potentially resulting in higher costs. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Key Initiatives and Challenges — Generation Resources — Coal Combustion Residual Facilities, Note 8 — Background — Lawsuit Brought by TDEC and Lawsuit Brought by TSRA and TCWN and Note 21 — Legal Proceedings — Cases Involving Gallatin Fossil Plant CCR Facilities.

### Environmental Investments

From the 1970s to 2017, TVA spent approximately \$6.7 billion on controls to reduce emissions from its coal-fired power plants. In addition, TVA has reduced emissions by idling or retiring coal-fired units and relying more on cleaner energy resources including natural gas and nuclear generation.

SO<sub>2</sub> Emissions and NO<sub>x</sub> Emissions. To reduce SO<sub>2</sub> emissions, TVA operates scrubbers on 17 of its coal-fired units, with scrubbers currently under construction on two additional units, and switched to lower-sulfur coal at 20 coal-fired units. To reduce NO<sub>x</sub> emissions, TVA operates SCRs on 18 coal-fired units with SCRs currently under construction on four additional units, operates selective non-catalytic reduction systems on four units, operates low-NO<sub>x</sub> burners or low-NO<sub>x</sub> combustion systems on 19 units, operates over-fire air on six cyclone units, optimized combustion on six units, and operates NO<sub>x</sub> control equipment year round when units are operating (except during start-up, shutdown, and maintenance periods). TVA has also retired or announced plans to retire 33 of 59 coal-fired units. Except for seven units at Shawnee, the remaining coal-fired units will either have scrubbers and SCRs or be retired. See Power Supply and Load Management Resources — Coal-Fired above.

Particulate Emissions. To reduce particulate emissions of air pollutants, TVA has equipped all of its coal-fired units with scrubbers, mechanical collectors, electrostatic precipitators, and/or bag houses.

There could be additional material costs if further reductions of GHGs, including CO<sub>2</sub>, are mandated by legislative, regulatory, or judicial actions and if more stringent emission reduction requirements for conventional pollutants are established. These costs cannot reasonably be predicted at this time because of the uncertainty of these actions. A number of emerging EPA regulations establishing more stringent air, water, and waste requirements could result in significant changes in the structure of the U.S. power industry, especially in the eastern half of the country.

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TVA currently anticipates spending significant amounts on environmental projects through 2025, including investments in new clean energy generation including natural gas, nuclear, and renewables to reduce TVA's overall environmental footprint. TVA environmental project expenditures also result from coal-fired plant decommissioning and from effective ash management modernization. Based on TVA's decisions regarding certain coal-fired units under the Environmental Agreements, the amount and timing of expenditures could change. See Power Supply and Load Management Resources — Coal-Fired above and Estimated Required Environmental Expenditures below.

## Estimated Required Environmental Expenditures

The following table contains information about TVA's current estimates on projects related to environmental laws and regulations.

Air, Water, and Waste Quality Estimated Potential Environmental Expenditures<sup>(1)</sup>

At September 30, 2017

(in millions)

	Estimated Timetable	Total Estimated Expenditures
Coal combustion residual conversion program <sup>(2)</sup>	2018-2022	\$ 1,100
Proposed clean air control projects <sup>(3)</sup>	2018-2022	200
Clean Water Act requirements <sup>(4)</sup>	2018-2026	500

## Notes

(1) These estimates are subject to change as additional information becomes available and as laws or regulations change.

(2) Includes costs associated with pond closures, conversion of wet to dry handling, and landfill activities. TVA is continuing to evaluate the rules and their impact on its operations, including the cost and timing estimates of related projects. Includes approximately \$140 million for Gallatin projects that are part of the original activities scheduled in TVA's CCR Conversion Program and excludes costs resulting from any new requirements related to the Gallatin lawsuits. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Key Initiatives and Challenges — Coal Combustion Residual Facilities and Note 8.

(3) Includes air quality projects that TVA is currently planning to undertake to comply with existing and proposed air quality regulations, but does not include any projects that may be required to comply with potential GHG regulations or transmission upgrades.

(4) Includes projects that TVA is currently planning to comply with revised rules under the Clean Water Act (i.e., Section 316(b) and effluent limitation guidelines for steam electric power plants).

## Employees

On September 30, 2017, TVA had 10,092 employees, of whom 3,580 were trades and labor employees. Neither the federal labor relations laws covering most private sector employers nor those covering most federal agencies apply to TVA. However, the TVA Board has a long-standing policy of acknowledging and dealing with recognized representatives of its employees, and that policy is reflected in long-term agreements to recognize the unions (or their successors) that represent TVA employees. Federal law prohibits TVA employees from engaging in strikes against TVA.

## ITEM 1A. RISK FACTORS

The risk factors described below, as well as the other information included in this Annual Report, should be carefully considered. Risks and uncertainties described in these risk factors could cause future results to differ materially from historical results as well as from the results anticipated in forward-looking statements. Although the risk factors described below are the ones that TVA considers significant, additional risk factors that are not presently known to TVA or that TVA presently does not consider significant may also impact TVA's business operations. See Forward Looking Information above for a description of some matters that could affect the below risks or generate new risks. Although the TVA Board has the authority to set TVA's own rates and may mitigate some risks by increasing rates, there may be instances in which TVA would be unable to partially or completely eliminate one or more of these risks through rate increases over a reasonable period of time or at all. Accordingly, the occurrence of any of the following could have a material adverse effect on TVA's cash flows, results of operations, and financial condition.

For ease of reference, the risk factors are presented in four categories: (1) regulatory, legislative, and legal risks, (2) operational risks, (3) financial, economic, and market risks, and (4) general business risks.

#### REGULATORY, LEGISLATIVE, AND LEGAL RISKS

New laws, regulations, or administrative orders, or congressional action or inaction, may negatively affect TVA's cash flows, results of operations, and financial condition, as well as the way TVA conducts its business.

Because TVA is a corporate agency and instrumentality established by federal law, it may be affected by a variety of laws, regulations, and administrative orders that do not affect other electric utilities. For example, Congress may enact legislation that expands or reduces TVA's activities, changes its governance structure, requires TVA to sell some or all of the assets that it operates, reduces or eliminates the United States' ownership of TVA, or even liquidates TVA. Additionally, Congress could act, or fail to take action, on various issues that may result in impacts to TVA, including but not limited to action or inaction related to the national debt ceiling or automatic spending cuts in government programs.

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Although it is difficult to predict exactly how new laws, regulations, or administrative orders or congressional action or inaction may impact TVA, some of the possible effects are described below.

TVA may become subject to additional environmental regulation.

New environmental laws, regulations, or orders may become applicable to TVA or the facilities it operates, and existing environmental laws or regulations may be revised or reinterpreted in a way that adversely affects TVA. Possible areas of future laws or regulations include, but are not limited to, greenhouse gases, coal combustion residuals, water quality, renewable energy portfolio standards, and natural gas production and transmission.

TVA's ability to control or allocate funds could be restricted.

Other federal entities may attempt to restrict TVA's ability to access or control its funds that are on deposit in TVA's account in the U.S. Treasury. For example, should the U.S. Treasury approach its debt ceiling, the U.S. Treasury might, as part of an effort to control cash disbursements, attempt to require TVA to receive approval before disbursement of funds from TVA's U.S. Treasury account. Additionally, the OMB might, in the event that automatic spending cuts go into effect, attempt to require TVA to reduce its budget by a specified percentage (although the legal applicability of such a situation to TVA would depend upon the wording of the legislation making the automatic spending cuts). Such attempts to restrict TVA's ability to control or allocate funds in those specific types of situations could adversely affect its cash flows, results of operations, and financial condition, its relationships with creditors, vendors, and counterparties, the way it conducts its business, and its reputation.

TVA may lose its protected service territory.

TVA's service area is defined primarily by provisions of law and long-term contracts. The fence limits the region in which TVA or LPCs which distribute TVA power may provide power. The anti-cherry-picking provision limits the ability of others to use the TVA transmission system for the purpose of serving customers within TVA's service area. State service territory laws limit unregulated third parties' ability to sell electricity to consumers. All TVA wholesale power contracts and many contracts between LPCs and their customers are requirements contracts. However, other utilities may use their own transmission lines to serve customers within TVA's service area, and third parties are able to avoid the restrictions on serving end-use customers by selling or leasing a customer generating assets rather than selling electricity.

From time to time, there have been efforts to erode the protection of the anti-cherry-picking provision, and the protection of the anti-cherry-picking provision could be limited and perhaps eliminated by congressional legislation at some time in the future. If Congress were to eliminate or reduce the coverage of the anti-cherry-picking provision but retain the fence, TVA could more easily lose customers that it could not replace within its specified service area. The loss of these customers could adversely affect TVA's cash flows, results of operations, and financial condition.

The TVA Board may lose its sole authority to set rates for electricity.

Under the TVA Act, the TVA Board has the sole authority to set the rates that TVA charges for electricity, and these rates are not subject to further review. If the TVA Board loses this authority or if the rates become subject to outside review, there could be material adverse effects on TVA including, but not limited to, being unable to set rates at a level sufficient to generate adequate revenues to service TVA's financial obligations, properly operate and maintain its power assets, and provide for reinvestment in its power program and becoming subject to additional regulatory oversight that could impede its ability to adapt its business to changing circumstances.

TVA may lose responsibility for managing the Tennessee River system.

TVA's management of the Tennessee River system is important to effectively operate its power system. TVA's ability to integrate management of the Tennessee River system with power system operations increases power system reliability and reduces costs. Restrictions on how TVA manages the Tennessee River system could negatively affect its operations.

TVA may lose responsibility for managing real property currently under its control.

TVA's management of real property containing power generation and transmission structures as well as certain reservoir shorelines is important for navigation, flood control, and the effective operation of the power system. Restrictions on or the loss of the authority to manage these properties could negatively affect TVA's operations, change the way it conducts such operations, or increase costs.



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Existing laws, regulations, and orders may negatively affect TVA's cash flows, results of operations, and financial condition, as well as the way TVA conducts its business.

TVA is required to comply with comprehensive and complex laws, regulations, and orders. The costs of complying with these laws, regulations, and orders are expected to be substantial, and costs could be significantly more than TVA anticipates, especially in the environmental, nuclear, and transmission reliability areas. To settle the EPA and other claims involving alleged NSR violations, TVA agreed to retire 18 coal-fired units and pay a civil penalty. The cost to install the necessary equipment to comply with existing environmental laws, regulations, settlement agreements, and orders at some other facilities has caused TVA to retire additional units and may render some other facilities uneconomical, which may cause TVA to retire or idle additional facilities. In addition, TVA is required to obtain numerous permits and approvals from governmental agencies that regulate its business, and TVA may be unable to obtain or maintain all required regulatory approvals. If there is a delay in obtaining required regulatory approvals or if TVA fails to obtain or maintain any approvals or to comply with any law, regulation, or order, TVA may have to change how it operates certain assets, may be unable to operate certain assets, or may have to pay fines or penalties if it continues to operate the assets.

Additional NRC requirements may negatively affect TVA's cash flows, results of operations, and financial condition or impact TVA's ability to operate its nuclear facilities.

Supplementary NRC rulemaking is under development to mitigate beyond design basis flooding events and seismic events. Complying with these or other requirements adopted by the NRC may require significant capital expenditures and may negatively affect TVA's cash flows, results of operations, and financial condition. Should TVA be unable to comply with the requirements, TVA may not be able to operate its nuclear facilities as currently contemplated by TVA's generation plans.

TVA is involved in various legal and administrative proceedings whose outcomes may affect TVA's finances and operations.

TVA is involved in various legal and administrative proceedings and is likely to become involved in additional proceedings in the future in the ordinary course of business, as a result of catastrophic events, as a result of environmental conditions at TVA property or areas where TVA has disposed of materials or property, or otherwise. The additional proceedings could involve, among other things, challenges to TVA's CCR facilities and nuisance suits involving TVA's coal-fired plants. Although TVA cannot predict the outcome of the individual matters in which TVA is involved or will become involved, the resolution of these matters could require TVA to make expenditures in excess of established reserves and in amounts that could have a material adverse effect on TVA's cash flows, results of operations, and financial condition. Similarly, resolution of any such proceedings may require TVA to change its business practices or procedures, change how it operates its coal-fired units, reduce emissions to a greater extent than TVA had planned, close existing CCR facilities sooner than planned, build new CCR facilities sooner than planned, build new CCR facilities that were not planned, or even cease operation of some coal-fired units.

TVA is largely restricted to a defined service area.

TVA's ability to expand its customer base is constrained by its inability to pursue new customers outside its service area. Accordingly, reductions in demand have to be offset by such actions as reducing TVA's internal costs or increasing rates. Any failure of such measures to fully offset the reduced demand for power may negatively affect TVA's cash flows, results of operations, and financial condition.

TVA may become subject to additional NERC requirements.

TVA is subject to federal reliability standards that are set forth by NERC and approved by FERC. TVA recognizes that reliability standards and expectations continue to become more complex and stringent for transmission systems. At present there are approximately 90 mandatory standards subject to enforcement containing approximately 1,300 requirements and sub-requirements that must be met. Complying with these or additional requirements set forth by NERC may require significant capital expenditures and may negatively affect TVA's cash flows, results of operations, and financial condition.

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OPERATIONAL RISKS

TVA may incur delays and additional costs in its major projects and may be unable to obtain necessary regulatory approval.

Among other projects, TVA is constructing a natural gas-fired plant, conducting the extended power uprate project at Browns Ferry, undertaking repairs at certain hydroelectric facilities, and closing some coal-fired plants and their supporting infrastructure. These activities involve risks of overruns in the cost of labor and materials as well as risks of schedule delays, which may result from, among other things, changes in laws or regulations, lack of productivity, human error, and the failure to schedule activities properly. In addition, if TVA does not or cannot obtain the necessary regulatory approvals or licenses, is otherwise unable to complete the development or construction of a facility, decides to cancel construction of a facility, or incurs delays or cost overruns in connection with constructing a facility, or is required to change how it will conduct construction, repair, or closure activities, TVA's cash flows, financial condition, and results of operations could be negatively affected. Further, if projects are not completed according to specifications, TVA may suffer, among other things, delays in receiving licenses, reduced plant efficiency, reduced transmission system integrity and reliability, and higher operating costs.

TVA may not be able to operate one or more of its nuclear power units.

Should issues develop with TVA's nuclear power units that TVA is unable to correct, TVA might voluntarily shut down one or more units or be ordered to do so by the NRC. Returning the unit(s) into operation could be a lengthy and expensive process, or might not be possible depending on circumstances. In either case, TVA's cash flows, results of operations, financial condition, and reputation may be negatively affected.

Operating nuclear units subjects TVA to nuclear risks and may result in significant costs that adversely affect its cash flows, results of operations, and financial condition.

TVA has seven operating nuclear units. Risks associated with these units include the following:

**Nuclear Risks.** A nuclear incident at one of TVA's facilities could have significant consequences including loss of life, damage to the environment, damage to or loss of the facility, and damage to non-TVA property. Although TVA carries certain types of nuclear insurance, the amount that TVA is required to pay in connection with a nuclear incident could significantly exceed the amount of coverage provided by insurance. Any nuclear incident in the United States, even at a facility that is not operated by or licensed to TVA, has the potential to impact TVA adversely by obligating TVA to pay up to \$133 million per year and a total of \$891 million per nuclear incident under the Price-Anderson Act. Any such nuclear incident could also negatively affect TVA by, among other things, obligating TVA to pay retrospective insurance premiums, reducing the availability and affordability of insurance, increasing the costs of operating nuclear units, or leading to increased regulation or restriction on the construction, operation, and decommissioning of nuclear facilities. Moreover, Congress could impose revenue-raising measures on the nuclear industry to pay claims exceeding the limit for a single incident under the Price-Anderson Act. Further, the availability or price of insurance may be impacted by TVA's acts or omissions, such as a failure to properly maintain a facility, or events outside of TVA's control, such as an equipment manufacturer's inability to meet a guideline, specification, or requirement.

**Decommissioning Costs.** TVA maintains a NDT for the purpose of providing funds to decommission its nuclear facilities. The NDT is invested in securities generally designed to achieve a return in line with overall equity market performance. TVA might have to make unplanned contributions to the NDT if, among other things:

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The value of the investments in the NDT declines significantly or the investments fail to achieve the assumed real rate of return;

•The decommissioning funding requirements are changed by law or regulation;

•The assumed real rate-of-return on plan assets, which is currently five percent, is lowered by the TVA Board or is overly optimistic;

•The actual costs of decommissioning are more than planned;

•Changes in technology and experience related to decommissioning cause decommissioning cost estimates to increase significantly;

•TVA is required to decommission a nuclear plant sooner than it anticipates; or

•The NRC guidelines for calculating the minimum amount of funds necessary for decommissioning activities are significantly changed.

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If TVA makes additional contributions to the NDT, the contributions may negatively affect TVA's cash flows, results of operations, and financial condition.

**Increased Regulation.** The NRC has broad authority to adopt requirements related to the licensing, operating, and decommissioning of nuclear generation facilities that can result in significant restrictions or requirements on TVA. If the NRC modifies existing requirements or adopts new requirements, TVA may be required to make substantial capital expenditures at its nuclear plants or make substantial contributions to the NDT. In addition, if TVA fails to comply with requirements promulgated by the NRC, the NRC has the authority to impose fines, shut down units, or modify, suspend, or revoke TVA's operating licenses.

**Waste Disposal.** TVA's nuclear operations produce various types of nuclear waste materials, including spent fuel. TVA has been storing the spent fuel in accordance with NRC regulations in anticipation that a final storage site for all such waste will be developed and put in operation by the United States government. If no such site is forthcoming or if no alternative disposal or reuse plan is developed, then TVA might be required to arrange for the safe and permanent disposal of the spent fuel itself. Such a requirement would cause TVA to incur substantial expense, including substantial capital expenditures, and could cause TVA to change how it operates its nuclear plants.

**Availability of Components.** Nuclear facilities require specialized components and access to intellectual property for operation. As the number of reliable suppliers of such components and access to intellectual property is reduced, the availability of the components and access to the intellectual property will also likely decrease. If TVA is unable to secure either the original components, intellectual property, or replacements approved for use by the NRC, TVA might have to change how it conducts its operations.

TVA's operation of coal combustion residual facilities exposes it to additional costs and risks.

TVA operates coal-fired units which produce CCR as byproducts of the power production process. The CCR is contained within dedicated facilities operated by TVA. TVA has closed some of these facilities in compliance with state and federal laws and is in the process of closing others. Some facilities are intended to remain open during the life of the associated generation unit. Many of these facilities were constructed prior to the requirement that such facilities be built with liners and thus do not contain such liners. TVA has been involved in litigation with regard to certain of these facilities, and has been ordered to move all CCR material from unlined facilities at Gallatin Fossil Plant to a lined facility that will have to be constructed for that purpose. TVA could be subject to similar litigation and orders at other TVA facilities. TVA has also been ordered by TDEC to undertake investigations for all facilities in Tennessee. TVA could be required to restrict or stop the use of any or all CCR facilities or relocate CCR material to other lined facilities which do not currently exist. These measures would impact how TVA operates its facilities, cause TVA to incur greater expenses than currently anticipated for operating or closing existing CCR facilities, and impact TVA's cash flow and results of operations. Additionally, the relocation of materials would result in a lengthy process with the potential for environmental and safety impacts, which could cause extensive monetary and reputational impacts to TVA.

TVA's facilities and operations may be damaged or interfered with by physical attacks, threats or other interference.

TVA has an extensive generation and transmission system and supporting infrastructure that includes, among other things, TVA's generation facilities and transmission infrastructure such as substations and towers. Some of TVA's hydroelectric facilities include navigation locks which are necessary for commerce along the Tennessee River system. TVA also operates flood control dams and supporting infrastructure. Because of TVA's status as a governmental corporation and TVA's role as predominately the sole power provider for its service territory, TVA may be targeted by individuals, groups, or nation states for physical attacks or threats of such attacks. Although TVA's operations are protected by automated monitoring systems, TVA employees, local law enforcement, or a combination thereof, it may

not be possible to effectively deter or prevent attacks. Such attacks could pose health and safety risks, significantly disable or destroy TVA assets, interfere with TVA's operations, result in additional regulatory or security requirements, and negatively affect TVA's cash flows, results of operations, and financial condition.

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TVA's facilities and information infrastructure may not operate as planned due to cyber threats to TVA's assets and operations.

TVA's operations are heavily computerized and include assets such as information technology and networking systems. As with all industries, the reliance on computerization and networking makes TVA a target for cyber attacks, and the risk of such attacks may increase as individual devices and equipment become accessible via the internet. TVA has been targeted by cyber attacks in the past and anticipates that it will be targeted in the future. These attacks may have been carried out, or in the future could be carried out, by individuals, groups, or nation states. Although TVA has extensive cyber safeguards and works with industry specialists and relevant governmental authorities to deter, stop or mitigate cyber attacks, it is possible that these measures could fail. In such a case, a cyber attack could compromise sensitive data, significantly disrupt operations, require additional expenditures for cyber security, negatively affect TVA's cash flows, results of operations, financial condition, and reputation, and pose health and safety risks. Additionally, the theft, damage, or improper disclosure of sensitive data may also subject TVA to penalties and claims from third parties.

Cyber attacks on third parties could interfere with or harm TVA.

TVA relies on third parties for various services, including transferring funds to non-TVA entities in the ordinary course of business. As with TVA, these third parties are heavily computerized and include assets such as information technology and networking systems. If these third parties undergo cyber attacks, the services they provide TVA could be disrupted. This disruption could interfere with TVA's abilities to transfer funds or make payments, which in turn could negatively affect TVA's financial condition and reputation. Additionally, the theft, damage, or improper disclosure of sensitive data held by these third parties may also subject TVA to additional harm.

TVA's assets or their supporting infrastructure may not operate as planned.

Many of TVA's assets, including generation, transmission, navigation, and flood control assets, have been operating for several decades and have been in nearly constant service since they were completed. Additionally, certain of TVA's newer assets have experienced operating issues and manufacturing defects in essential equipment. The failure of TVA's assets or their supporting infrastructure to perform as planned may cause health, safety, or environmental problems and may even result in events such as the failure of a dam, the inability to maintain a reservoir at the normal or expected level, or an incident at a coal-fired, gas-fired, or nuclear plant or a CCR facility. If these assets or their supporting infrastructure fail to operate as planned, if necessary repairs or upgrades are delayed or cannot be completed as quickly as anticipated, or if necessary spare parts are unavailable, TVA, among other things:

- ♣May have to invest a significant amount of resources to repair or replace the assets or the supporting infrastructure;
- ♣May have to remediate collateral damage caused by a failure of the assets or the supporting infrastructure;
- ♣May not be able to maintain the integrity or reliability of the transmission system at normal levels;
- ♣May have to operate less economical sources of power;
- ♣May have to purchase replacement power on the open market at prices greater than its generation costs;
- ♣May be required to invest substantially to meet more stringent reliability standards;
- ♣May be unable to maintain insurance on affected facilities, or be required to pay higher premiums for coverage, unless necessary repairs or upgrades are made;

- May be unable to operate the assets for a significant period of time;  
and

May not be able to meet its contractual obligations to deliver power.

Any of these potential outcomes may negatively affect TVA's cash flows, results of operations, financial condition, and reputation.



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TVA's safety program may not prevent accidents that could, among other things, impact TVA's operations or financial condition.

TVA's safety program, no matter how well designed and operated, may not completely prevent accidents. In addition to the potential human cost of accidents, which could include injury to employees or members of the public, significant accidents could impact TVA's ability to carry out operations, cause it to shut down facilities, subject it to additional regulatory scrutiny, expose it to litigation, damage its reputation, interfere with its ability to attract or retain a skilled workforce, and harm its financial condition.

Weather conditions may influence TVA's ability to supply power and its customers' demands for power.

Extreme temperatures may increase the demand for power and require TVA to purchase power at high prices to meet the demand from customers, while unusually mild weather may result in decreased demand for power and lead to reduced electricity sales. Also, in periods of below normal rainfall or drought, TVA's low-cost hydroelectric generation may be reduced, requiring TVA to purchase power or use more costly means of producing power. Additionally, periods of either high or low levels of rainfall may impede river traffic, impacting barge deliveries of critical items such as coal and equipment for power facilities. Furthermore, high river water temperatures in the summer may limit TVA's ability to use water from the Tennessee or Cumberland River systems for cooling at certain of TVA's generating facilities, thereby limiting its ability to operate these generating facilities. This situation would be aggravated during periods of reduced rainfall or drought. If changes in the climate make such shifts in weather more common or extreme, TVA may be required to, among other things, change its generation mix or change how it conducts its operations.

Catastrophic events may negatively affect TVA's cash flows, results of operations, and financial condition.

TVA's cash flows, results of operations, and financial condition may be adversely affected, either directly or indirectly, by catastrophic events such as fires, earthquakes, explosions, solar events, electromagnetic pulses, droughts, floods, tornadoes, wars, national emergencies, terrorist activities, pandemics, and other similar destructive or disruptive events. These events, the frequency and severity of which are unpredictable, may, among other things, lead to legislative or regulatory changes that affect the construction, operation, and decommissioning of nuclear units and the storage of spent fuel; limit or disrupt TVA's ability to generate and transmit power; limit or disrupt TVA's ability to provide flood control and river management; reduce the demand for power; disrupt fuel or other supplies; require TVA to produce additional tritium; lead to an economic downturn; require TVA to make substantial capital investments for repairs, improvements, or modifications; and create instability in the financial markets. If public opposition to nuclear power makes operating nuclear plants less feasible as a result of any of these events, TVA may be forced to shut down its nuclear plants. This would make it substantially more difficult for TVA to obtain greater amounts of its power supply from low or zero carbon emitting resources and to replace its generation capacity when faced with retiring or idling certain coal-fired units. Additionally, some studies have predicted that climate change may cause catastrophic events, such as droughts and floods, to occur more frequently in the Tennessee Valley region, which could adversely impact TVA.

TVA's service reliability could be affected by problems at other utilities or at TVA facilities, or by the increase in intermittent sources of power.

TVA's transmission facilities are directly interconnected with the transmission facilities of neighboring utilities and are thus part of the larger interstate power transmission grid. Certain of TVA's generation and transmission assets are critical to maintaining reliability of the transmission system. Additionally, TVA uses certain assets that belong to third parties to transmit power and maintain reliability. Accordingly, problems at other utilities as well as at TVA's facilities may cause interruptions in TVA's service to TVA's customers, increase congestion on the transmission grid, or reduce

service reliability. In addition, the increasing contribution of intermittent sources of power, such as wind and solar, may place additional strain on TVA's system as well as on surrounding systems. If TVA suffers a service interruption, increased congestion, or reduced service reliability, TVA's cash flows, results of operations, financial condition, and reputation may be negatively affected.

TVA's supplies of fuel, purchased power, or other critical items may be disrupted.

TVA purchases coal, uranium, natural gas, fuel oil, and electricity from a number of suppliers. Additionally, TVA contracts for conversion of uranium into nuclear fuel and purchases other items, such as anhydrous ammonia, liquid oxygen, or replacement parts that are critical to the operation of certain generation assets. TVA also purchases power from other power producers when the purchase of such power is appropriate due to economic opportunities or operational concerns. Disruption in the acquisition or delivery of fuel, purchased power, contracted services, or other critical supplies may result from a variety of physical and commercial events, political developments, legal actions, or environmental regulations affecting TVA's suppliers as well as from transportation or transmission constraints. If one of TVA's suppliers fails to perform under the terms of its contract with TVA, TVA might have to purchase replacement fuel, power, or other critical supplies, perhaps at a significantly higher price than TVA is entitled to pay under the contract. In some circumstances, TVA may not be able to recover this difference from the supplier. In addition, any disruption of

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TVA's supplies could require TVA to operate higher cost generation assets, thereby adversely affecting TVA's cash flows, results of operations, and financial condition. Moreover, if TVA is unable to acquire enough replacement fuel, power, or supplies, or does not have sufficient reserves to offset the loss, TVA may not be able to operate certain assets or provide enough power to meet demand, resulting in power curtailments, brownouts, or even blackouts.

Events which affect the supply of water in the Tennessee River system and Cumberland River system may interfere with TVA's ability to generate power.

An inadequate supply of water in the Tennessee River system and Cumberland River system could negatively impact TVA's cash flows, results of operations, and financial condition by reducing generation not only at TVA's hydroelectric plants but also at its coal-fired and nuclear plants, which depend on water from the river systems near which they are located for cooling and for use in boilers where water is converted into steam to drive turbines. An inadequate supply of water could result, among other things, from periods of low rainfall or drought, the withdrawal of water from the river systems by governmental entities or others, and incidents affecting bodies of water not managed by TVA. While TVA manages the Tennessee River and a large portion of its tributary system to provide much of the water necessary for the operation of its power plants, the USACE operates and manages other bodies of water upon which some of TVA's facilities rely. Events at these bodies of water or their associated hydroelectric facilities may interfere with the flow of water and may result in TVA's having insufficient water to meet the needs of its plants. If TVA has insufficient water to meet the needs of its plants, TVA may be required to reduce generation at its affected facilities to levels compatible with the available supply of water.

TVA's determination of the appropriate mix of generation assets may change.

TVA has determined that its power generation assets should consist of a mix of nuclear, coal-fired, natural gas-fired, and renewable power sources, including hydroelectric. In making this determination, TVA took various factors into consideration, including the anticipated availability of its nuclear units, the availability of non-nuclear facilities, the forecasted cost of natural gas and coal, the forecasted demand for electricity, and environmental compliance including the expense of adding air pollution controls to its coal-fired units. If any of these assumptions materially change or are overtaken by subsequent events, then TVA's generation mix may not adequately address its operational needs. Resolving such a situation may require capital expenditures or additional power purchases, and TVA's cash flows, results of operations, financial condition, and reputation may be negatively affected.

## FINANCIAL, ECONOMIC, AND MARKET RISKS

TVA's cost reduction efforts may not be successful.

TVA is continuing to work to reduce operating expenses to offset reductions in power demand. The failure to achieve or maintain cost reductions could adversely affect TVA's rates, reputation, cash flows, results of operations, and financial condition.

TVA may have to make significant contributions in the future to fund its qualified pension plan.

At September 30, 2017, TVA's qualified pension plan had assets of approximately \$8.0 billion compared to liabilities of approximately \$12.6 billion. The plan is mature with approximately 24,000 retirees and beneficiaries receiving benefits of over \$700 million per year. The costs of providing benefits depend upon a number of factors, including, but not limited to, provisions of the plan; changing experience and assumptions related to terminations, retirements, and mortality; rates of increase in compensation levels; rates of return on plan assets; discount rates used in determining future benefit obligations and required funding levels; optional forms of benefit payments selected; future government regulation; and levels of contributions made to the plan.

Although the plan is frozen to new participants, any of these factors or any number of these factors could keep at high levels, or even increase, the costs of providing benefits and require TVA to make contributions to the plan in amounts that significantly exceed TVA's planned contributions. Unfavorable financial market conditions may result in lower expected rates of return on plan assets, loss in value of the investments, and lower discount rates used in determining future benefit obligations. These changes would negatively impact the funded status of the plan. Additional contributions to the plan and absorption of additional costs would negatively affect TVA's cash flows, results of operations, and financial condition.

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TVA's debt ceiling could be made more restrictive. Additionally, approaching or reaching TVA's debt ceiling could limit TVA's ability to carry out its business.

The TVA Act provides that TVA can issue Bonds in an amount not to exceed \$30.0 billion outstanding at any time. At September 30, 2017, TVA had \$24.2 billion of Bonds outstanding (not including noncash items of foreign currency exchange gain of \$125 million, unamortized debt issue costs of \$59 million and net discount on sale of Bonds of \$93 million).

Approaching or reaching the debt ceiling may adversely affect TVA's business by limiting TVA's ability to access capital markets and increasing the amount of debt TVA must service. Also, Congress may lower TVA's debt ceiling or broaden the types of financial instruments that are covered by the ceiling. Either of these scenarios may also restrict TVA's ability to raise capital to acquire new power program assets or maintain existing ones, to carry out upgrades or improvements to existing assets or build new ones, to purchase power under long-term power purchase agreements, or to meet regulatory requirements. In addition, approaching or reaching the debt ceiling may lead to increased legislative or regulatory oversight of TVA's activities and could lead to negative rating actions by credit rating agencies.

TVA may be unable to meet its current cash requirements if TVA's access to the debt markets is limited.

TVA uses cash provided by operations together with proceeds from power program financings and other financing arrangements to fund its current cash requirements. It is critical that TVA continues to have access to the debt markets in order to meet its cash requirements. The importance of having access to the debt markets is underscored by the fact that TVA, unlike many utilities, relies almost entirely on debt capital since, as a governmental instrumentality, TVA cannot issue equity securities.

TVA's credit ratings may be impacted by congressional actions or by a downgrade of the United States' sovereign credit ratings.

TVA's current credit ratings are not based solely on its underlying business or financial condition but are based to a large extent on the legislation that defines TVA's business structure. Key characteristics of TVA's business defined by legislation include (1) the TVA Board's ratemaking authority, (2) the current competitive environment, which is defined by the fence and the anti-cherry-picking provision, and (3) TVA's status as a corporate agency and instrumentality of the United States. If Congress takes any action that effectively alters any of these characteristics, TVA's credit ratings could be downgraded.

Although TVA Bonds are not obligations of the United States, TVA, as a corporate agency and instrumentality of the United States, may be impacted if the sovereign credit ratings of the United States are downgraded. Such a downgrade of the United States' sovereign credit ratings could, among other things, result in a downgrade of TVA's credit rating. Additionally, the economy could be negatively impacted resulting in reduced demand for electricity, an increase in borrowing costs, and an increase in the cost of fuels, supplies, and other materials required for TVA's operations.

TVA, together with owners of TVA securities, may be impacted by downgrades of TVA's credit ratings.

Downgrades of TVA's credit ratings may have material adverse effects on TVA's cash flows, results of operations, and financial condition as well as on investors in TVA securities. Among other things, a downgrade could increase TVA's interest expense by increasing the interest rates that TVA pays on new securities that it issues. Such an increase may reduce the amount of cash available for other purposes, which may result in the need to increase borrowings, to reduce other expenses or capital investments, or to increase power rates. A downgrade may also result in TVA's having to post collateral under certain physical and financial contracts that contain ratings triggers. A downgrade below a

contractual threshold may prevent TVA from borrowing under four credit facilities totaling \$2.7 billion or posting letters of credit as collateral under these facilities. At September 30, 2017, there were \$1.2 billion of letters of credit outstanding under these facilities. If TVA were no longer able to post letters of credit as collateral, TVA would likely have to post cash as collateral, which would negatively affect TVA's liquidity. Further, a downgrade may lower the price of TVA securities in the secondary market, thereby hurting investors who sell TVA securities after the downgrade and diminishing the attractiveness and marketability of TVA securities.

TVA's assumptions about the future may be inaccurate.

TVA uses certain assumptions in order to develop its plans for the future. Such assumptions include economic forecasts, anticipated energy and commodity prices, cost estimates, construction schedules, power demand forecasts, the appropriate generation mix to meet demand, and potential regulatory environments. Should these assumptions be inaccurate, or be superseded by subsequent events, TVA's plans may not be effective in achieving the intended results, which could negatively affect cash flows, results of operations, and financial condition, as well as TVA's ability to meet electricity demand and the way TVA conducts its business.

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Demand for electricity may significantly decline or change, negatively affecting TVA's cash flows, results of operations, and financial condition.

Some of the factors that could reduce or change the demand for electricity include, but are not limited to, the following:

**Economic downturns.** Renewed economic downturns in TVA's service area or other parts of the United States could reduce overall demand for power and thus reduce TVA's power sales and cash flows, especially if TVA's industrial customers, which constitute a material portion of TVA's demand, reduce their operations and thus their consumption of power.

**Loss of customers.** TVA could lose customers if customers choose another utility where available, pursue self-generation to meet some or all of their power needs, or move their operations outside of TVA's service territory. The loss of customers could have a material adverse effect on TVA's cash flows, results of operations, or financial condition, and could result in higher rates, especially because of the difficulty in replacing customers on account of the fence.

**Change in demands for electricity generated from renewable sources.** TVA has been adapting its generation mix to account for the growing preference for electricity generated by renewable sources, such as solar or wind. If demand by customers for power that is largely or exclusively generated from renewable sources exceeds TVA's ability to produce such power, TVA might have to change how it operates and may incur additional expense in meeting this demand.

**Increased energy efficiency and conservation.** Increasingly efficient use of energy as well as conservation efforts have reduced the demand for power. Further reductions, if TVA is unable to compensate for them, could negatively affect TVA's cash flows, results of operations, and financial condition and could result in higher rates and changes to TVA's operations, especially if the reductions occur during an economic downturn or a period of slow economic growth.

**Change in technology** could require TVA to change how it conducts its operations, affect relationships with customers, or impact its financial condition.

TVA's primary business is to sell power it produces, for the most part, from large facilities such as nuclear power plants, hydroelectric facilities, natural gas-fired facilities, and coal-fired units. TVA sells power to LPCs and directly served customers. Research and development activities are ongoing to improve existing and alternative technologies to produce or store electricity, including large-scale energy storage, gas or wind turbines, fuel cells, microturbines, solar cells, and distributed energy or storage resources, such as microgrids. It is possible that advances in these or other alternative technologies could reduce the costs of such production methods to a level that will enable these technologies to compete effectively with traditional power plants such as TVA's. These technologies could be more appealing to customers and could lead them to bring pressure on TVA to modify the power contracts to allow customers to generate some of their own power requirements. Other customers might also cease purchasing power from TVA altogether. To the extent that sales to such customers are reduced or eliminated, TVA's cash flows, results of operations, and financial condition could be negatively affected. TVA could also be required to modify how it operates its traditional plants or further modify its generation mix to reduce reliance on these facilities.

Additionally, demand could change in terms of amount or timing as devices and equipment become more connected to the internet and it becomes possible to adjust real-time consumption of power. Such increased control over power consumption could, among other things, affect how TVA operates its facilities or dispatches power or require TVA to change its pricing structure or rates.

TVA is subject to a variety of market risks that may negatively affect TVA's cash flows, results of operations, and financial condition.

TVA is subject to a variety of market risks, including, but not limited to, commodity price risk, investment price risk, interest rate risk, counterparty credit and performance risk, and currency exchange rate risk.

**Commodity Price Risk.** If prices of commodities critical to operations, including coal, uranium, natural gas, fuel oil, crude oil, construction materials, or emission allowances, increase, TVA's rates may increase.

**Investment Price Risk.** TVA is exposed to investment price risk in the NDT, its ART, its Supplemental Executive Retirement Plan ("SERP"), its Deferred Compensation Plan ("DCP"), and its pension plan. If the value of the investments held in the NDT or the pension fund either decreases or fails to increase in accordance with assumed rates of return, TVA may be required to make substantial contributions to these funds. In addition, although TVA is not required to make contributions to the ART, it may choose to do so, particularly if TVA's estimates of its non-nuclear asset retirement obligation liabilities increase. TVA may also choose to make contributions to the SERP and DCP from time to time.



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**Interest Rate Risk.** Changes in interest rates may increase the amount of interest that TVA pays on new Bonds that it issues, decrease the return that TVA receives on short-term investments, decrease the value of the investments in the NDT, the ART, TVA's pension fund, the SERP and the DCP, increase the amount of collateral that TVA is required to post in connection with certain of its derivative transactions, and increase the losses on the mark-to-market valuation of certain derivative transactions into which TVA has entered.

**Counterparty Credit and Performance Risk.** TVA is exposed to the risk that its counterparties will not be able to perform their contractual obligations. If TVA's counterparties fail to perform their obligations, TVA's cash flows, results of operations, and financial condition may be adversely affected. In addition, the failure of a counterparty to perform may make it difficult for TVA to perform its obligations, particularly if the counterparty is a supplier of electricity or fuel.

**Currency Exchange Rate Risk.** Over the next several years, TVA plans to spend a significant amount of capital on various projects. A portion of this amount may be spent on contracts that are denominated in one or more foreign currencies. Additionally, TVA's three issues of Bonds denominated in British pounds sterling are hedged by currency swap agreements. The value of the U.S. dollar compared with other currencies has fluctuated widely in recent years, including recent fluctuations in the U.S. dollar to British pound sterling exchange rate primarily driven by the "BREXIT" vote for the United Kingdom to leave the European Union. If not effectively managed, foreign currency exposure could negatively impact TVA's counterparty risk, cash flows, results of operations, and financial condition.

TVA's ability to use derivatives to hedge certain risks may be limited.

Under the Dodd-Frank Wall Street Reform and Consumer Protection Act and its implementing regulations, TVA is subject to recordkeeping, reporting, and reconciliation requirements related to its derivative transactions. In addition, depending on how regulatory agencies interpret and implement the provisions of this act, TVA's hedging costs may increase, and TVA may have to post additional collateral and margin in connection with its derivative transactions. These occurrences may, among other things, negatively affect TVA's cash flows and cause TVA to reduce or modify its hedging activities, which could increase the risks to which TVA is exposed.

The market for TVA securities might be limited.

Although many TVA Bonds are listed on stock exchanges, there can be no assurances that any market will develop or continue to exist for any Bonds. Additionally, no assurances can be made as to the ability of the holders to sell their Bonds or as to the price at which holders will be able to sell their Bonds. Future trading prices of Bonds will depend on many factors, including prevailing interest rates, the then-current ratings assigned to the Bonds, the amount of Bonds outstanding, the time remaining until the maturity of the Bonds, the redemption features of the Bonds, the market for similar securities, and the level, direction, and volatility of interest rates generally, as well as the liquidity of the markets for those securities.

If a particular series of Bonds is offered through underwriters, those underwriters may attempt to make a market in the Bonds. Dealers other than underwriters may also make a market in TVA securities. However, the underwriters and dealers are not obligated to make a market in any TVA securities and may terminate any market-making activities at any time without notice.

Further, certain investors use the environmental impact or sustainability of an industry as a criteria for deciding whether to invest in that industry. TVA's use of fossil fuels could lead such investors to not purchase TVA securities.

In addition, legal limitations may affect the ability of banks and others to invest in Bonds. For example, national banks may purchase TVA Bonds for their own accounts in an amount not to exceed 10 percent of unimpaired capital

and surplus. Also, TVA Bonds are “obligations of a corporation which is an instrumentality of the United States” within the meaning of Section 7701(a)(19)(C)(ii) of the Internal Revenue Code for purposes of the 60 percent of assets limitation applicable to U.S. building and loan associations.

TVA may be unable to use regulatory accounting for some or all costs.

TVA uses regulatory accounting to defer certain costs. To qualify for regulatory accounting, costs must meet certain accounting criteria and be approved for regulatory accounting treatment by the TVA Board in its capacity as TVA’s regulator. If costs do not meet, or cease to meet, these criteria, or if the TVA Board disallows the treatment or ceases to be TVA’s sole regulator in such areas, TVA may not be able to defer those costs. Such an inability to defer costs would likely have a substantial impact on TVA’s financial condition and results of operations and could impact the timing and amounts of TVA’s rate recovery. For a discussion of regulatory accounting, see Item 7, Management’s Discussion and Analysis of Financial Condition and Results of Operations — Critical Accounting Policies and Estimates.

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TVA's financial control system cannot guarantee that all control issues and instances of fraud or errors will be detected.

No financial control system, no matter how well designed and operated, can provide absolute assurance that the objectives of the control system are met, and no evaluation of financial controls can provide absolute assurance that all control issues and instances of fraud or errors can be detected. The design of any system of financial controls is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions, regardless of how remote.

Payment of principal and interest on TVA securities is not guaranteed by the United States.

Although TVA is a corporate agency and instrumentality of the United States government, TVA securities are not backed by the full faith and credit of the United States. Principal and interest on TVA securities are payable solely from TVA's net power proceeds. Net power proceeds are the remainder of TVA's gross power revenues after deducting the costs of operating, maintaining, and administering its power properties and payments to states and counties in lieu of taxes, but before deducting depreciation accruals or other charges representing the amortization of capital expenditures, plus the net proceeds from the sale or other disposition of any power facility or interest therein. If TVA were to experience extreme financial difficulty and were unable to make payments of principal or interest on its Bonds, the federal government would not be legally obligated to prevent TVA from defaulting on its obligations. An inability to pay some or all of the principal or interest owed on a TVA security would likely have a negative impact on TVA's financial condition, reputation, or relationship with the investment community, and could result in cross-defaults in other financial arrangements.

## GENERAL BUSINESS RISKS

TVA's organizational structure may not adequately support TVA's anticipated business needs or enable it to meet the needs of its current or potential customers.

TVA has been modifying its organizational structure to better adapt to the forecasted economic environment. If TVA's assumptions about either its forecasts or the proper internal structure of the company to meet the expected environment are inaccurate or if this structure does not adequately support TVA's needs, TVA could face operational or financial challenges that could adversely affect TVA's cash flows, results of operations, and financial condition as well as TVA's ability to attract or retain a skilled workforce and to meet the needs of its current or potential customers.

TVA may have difficulty in adapting its business model to changes in the utility industry and customer preferences.

The traditional business model for power production, selling power from centrally located plants, is facing pressure from a variety of sources, including the potential for self-generation by current or potential customers and increased energy efficiency. These pressures may reduce the demand for TVA power. If TVA does not or cannot adapt to this pressure by changing its business model, TVA's financial condition and results of operations could be negatively affected.

TVA's quasi-governmental status may interfere in its ability to quickly respond to the needs of its current or potential customers or to act solely in the interest of its ratepayers.

As a quasi-governmental entity, TVA has certain legal requirements that prevent it from responding as quickly to potential changes in the market or requests from current or potential customers as might be desired. For example, TVA is required to comply with the National Environmental Policy Act ("NEPA"), which requires environmental reviews to be performed in connection with certain projects. The delay in responding to requests could damage

relationships with current customers, deter potential customers from moving into TVA's service territory, or damage TVA's reputation.

In addition, TVA's nature as a quasi-governmental entity imposes additional pressures that most companies do not face, such as the requirement to support economic development and promote recreational opportunities. TVA must balance these obligations with the requirement to provide power at the least system cost. If TVA does not adequately communicate how it fulfills its various missions and the value it provides, its reputation may be harmed, which may result in political pressure to change its nature or operations as well as in the loss of public support.

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TVA's reputation may be negatively impacted.

As with any company, TVA's reputation is a vital element of its ability to effectively conduct its business. TVA's reputation could be harmed by a variety of factors, including the failure of a generating asset or supporting infrastructure, real or perceived issues with TVA's safety culture or work environment, significant delays in construction projects, acts or omissions of TVA management, the perception of such acts or omissions, measures taken to offset reductions in demand, or a significant dispute with one of TVA's customers. Any deterioration in TVA's reputation may harm TVA's relationships with its customers and stakeholders, may increase TVA's cost of doing business, may interfere with its ability to attract and retain a skilled workforce, and may potentially lead to the enactment of new laws and regulations, or the modification of existing laws and regulations, that negatively affect the way TVA conducts its business.

Failure to attract and retain an appropriately qualified workforce may negatively affect TVA's results of operations.

TVA's business depends on its ability to recruit and retain key executive officers as well as skilled professional and technical employees. The inability to attract and retain an appropriately qualified workforce could adversely affect TVA's ability to, among other things, operate and maintain generation and transmission facilities, complete large construction projects, and successfully implement its continuous improvement initiatives.

Loss of a quorum of the TVA Board could limit TVA's ability to adapt to meet changing business conditions.

Under the TVA Act, a quorum of the TVA Board is five members. Becoming a member of the TVA Board requires confirmation by the U.S. Senate following appointment by the President. Further, TVA Board members may not continue in office indefinitely until a successor is appointed. The TVA Board is responsible for, among other things, establishing the rates TVA charges for power as well as TVA's long-term objectives, policies, and plans. Accordingly, loss of a quorum for an extended period of time would impair TVA's ability to change rates and to modify these objectives, policies, and plans. Such an impairment would likely have a negative impact on TVA's ability to respond to significant changes in technology, the regulatory environment, or the industry overall and, in turn, negatively affect TVA's cash flows, results of operations, and financial condition.

Changes in the membership of the TVA Board and TVA senior management could impact how TVA operates.

The TVA Board currently has three open positions and may have two more in the near future. In addition, there is always the possibility that one or more members of TVA's senior management may retire or otherwise leave TVA. The individuals filling either the TVA Board or senior management positions may wish to change how TVA operates in whole or in part. If the changes are not successful or TVA is not able to adapt properly to such changes, TVA's financial condition, results of operations, reputation, or relationship with customers could be harmed.

## ITEM 1B. UNRESOLVED STAFF COMMENTS

Not applicable.

## ITEM 2. PROPERTIES

TVA holds personal property in its own name but holds real property as agent for the United States. TVA may acquire real property as an agent of the United States by negotiated purchase or by eminent domain.

### Generating Properties

At September 30, 2017, TVA-operated generating assets consisted of 33 active coal-fired units, 7 nuclear units, 109 conventional hydroelectric units, 4 pumped-storage units, 15 combined-cycle power blocks, 87 simple-cycle units, 5 diesel generator units, one wind energy site (out of service), and 16 solar sites. See Note 13 — Lease/Leasebacks. In addition, TVA has biomass cofiring potential at its coal-fired sites. As of September 30, 2017, 24 of the simple-cycle combustion turbine units and four of the combined-cycle power blocks were leased to private entities and leased back to TVA under long-term leases. In addition, TVA is leasing the three Caledonia combined-cycle power blocks under a long-term lease. TVA is in the process of constructing additional generating assets. For a discussion of these assets, see Item 1, Business — Power Supply and Load Management Resources.

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## Net Capability

The following table summarizes TVA's summer net capability in megawatts ("MW") at September 30, 2017:

SUMMER NET CAPABILITY<sup>(1)</sup>

At September 30, 2017

Source of Capability	Location	Number of Units	Summer Net Capability (MW)	Date First Unit Placed in Service (CY)	Date Last Unit Placed in Service (CY)
TVA-Operated Generating Facilities					
Nuclear					
Browns Ferry	Alabama	3	3,309	1974	1977
Sequoyah	Tennessee	2	2,292	1981	1982
Watts Bar	Tennessee	2	2,122	1996	2016
Total Nuclear		7	7,723		
Coal-Fired					
Allen <sup>(2)</sup>	Tennessee	3	741	1959	1959
Bull Run	Tennessee	1	865	1967	1967
Cumberland	Tennessee	2	2,470	1973	1973
Gallatin	Tennessee	4	976	1956	1959
Johnsonville	Tennessee	4	428	1951	1959
Kingston	Tennessee	9	1,398	1954	1955
Paradise	Kentucky	1	971	1963	1970
Shawnee	Kentucky	9	1,206	1953	1955
Total Coal-Fired		33	9,055		
Natural Gas and/or Oil-Fired <sup>(4)(5)</sup>					
Simple-Cycle Combustion Turbine					
Allen	Tennessee	20	456	1971	1972
Brownsville	Tennessee	4	468	1999	1999
Colbert	Alabama	8	392	1972	1972
Gallatin	Tennessee	8	642	1975	2000
Gleason	Tennessee	3	500	2000	2000
Johnsonville	Tennessee	20	1,269	1975	2000
Kemper	Mississippi	4	348	2002	2002
Lagoon Creek	Tennessee	12	1,048	2001	2002
Marshall County	Kentucky	8	608	2002	2002
Subtotal Simple-Cycle Combustion Turbine		87	5,731		
Combined-Cycle Combustion Turbine					
Ackerman <sup>(6)</sup>	Mississippi	1	713	2007	2007
Caledonia <sup>(7)</sup>	Mississippi	3	765	2003	2003
John Sevier <sup>(8)</sup>	Tennessee	1	871	2012	2012
Lagoon Creek <sup>(9)</sup>	Tennessee	1	525	2010	2010
Magnolia	Mississippi	3	918	2003	2003
Paradise	Kentucky	3	1,100	2017	2017
Southaven	Mississippi	3	780	2003	2003
Subtotal Combined-Cycle Combustion Turbine		15	5,672		

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Total Natural Gas and/or Oil-Fired		102	11,403		
Hydroelectric					
Conventional Plants	Alabama	36	1,176	1925	1962
	Georgia	2	35	1931	1956
	Kentucky	5	223	1944	1948
	North Carolina	6	492	1940	1956
	Tennessee	60	1,851	1912	1972
Pumped-Storage <sup>(3)</sup>	Tennessee	4	1,616	1978	1979
Total Hydroelectric		113	5,393		
Diesel Generator					
Meridian	Mississippi	5	9	1998	1998
Total Diesel Generators		5	9		
TVA Renewable Resources (non-hydro) <sup>(10)</sup>			1		
Total TVA-Operated Generating Facilities			33,584		
Contract Renewable Resources <sup>(11)(12)</sup>			217		
Power Purchase and Other Agreements <sup>(13)</sup>			3,621		
Total Summer Net Capability			37,422		



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### Notes

- (1) Net capability is defined as the ability of an electric system, generating unit, or other system component to carry or generate power for a specified time period and does not include operational limitations such as derates.
- (2) Eight MW of cofired methane at Allen are presented as coal generation as opposed to TVA Renewable Resources.
- (3) See Item 1, Business — Power Supply and Load Management Resources — Hydroelectric and Other Renewable Energy Resources — Conventional Hydroelectric Dams for a discussion of Hiwassee Hydro Unit 2.
- (4) See Generating Properties above for a discussion of TVA-operated natural gas and/or oil-fired facilities subject to leaseback and long-term lease arrangements.
- (5) Peak firing of simple-cycle combustion turbine units accounts for 326 MW of short-term capability.
- (6) Ackerman Combined Cycle Facility is a single steam cycle unit driven by two gas turbines (2x1 configuration).
- (7) Caledonia Combined Cycle Plant is currently a leased facility operated by TVA.
- (8) John Sevier Combined Cycle Facility is a single steam cycle unit driven by three gas turbines (3x1 configuration).
- (9) Lagoon Creek Combined Cycle Facility is a single steam cycle unit driven by two gas turbines (2x1 configuration).
- (10) TVA owns 1 MW of solar installations at 16 sites.
- (11) Contract Renewable Resources include Generation Partners, Green Power Providers, Renewable Standard Offer, and Solar Solutions Initiative.
- (12) Solar and wind resources are listed at nameplate capacity.
- (13) Power Purchase and Other Agreements includes renewable resources. See Item 1, Business — Power Supply and Load Management Resources — Purchased Power and Other Agreements for information on renewable energy power purchase contracts.

### Transmission Properties

TVA's transmission system interconnects with systems of surrounding utilities and consisted primarily of the following assets at September 30, 2017:

- Approximately 2,500 circuit miles of 500 kilovolt, 11,600 circuit miles of 161 kilovolt, and 2,100 circuit miles of other voltage transmission lines;
- 513 transmission substations, power switchyards, and switching stations; and
- 1,304 customer connection points (customer, generation, and interconnection).

At September 30, 2017, certain qualified technological equipment and other software related to TVA's transmission system were leased to private entities and leased back to TVA under long-term leases. See Note 13 — Lease/Leasebacks.

### Natural Resource Stewardship Properties

TVA operates and maintains 49 dams and manages the following natural resource stewardship properties:

- Approximately 11,000 miles of reservoir shoreline;
- Approximately 293,000 acres of reservoir land;
- Approximately 650,000 surface acres of reservoir water; and
- Approximately 80 public recreation areas throughout the Tennessee Valley, including campgrounds, day-use areas, and boat launching ramps.

Additionally, TVA manages over 170 agreements for commercial recreation (such as campgrounds and marinas).

As part of its stewardship responsibilities, TVA approval is required to be obtained before any obstruction affecting navigation, flood control, or public lands can be constructed in or along the Tennessee River and its tributaries.

### Buildings

TVA has a variety of buildings and structures located throughout its service area including generation and transmission facilities, corporate offices, customer service centers, power service centers, warehouses, visitor centers, and crew quarters. The most significant of these buildings are its Knoxville Office Complex ("KOC") and the Chattanooga Office Complex in Tennessee as well as a significant number of buildings in Muscle Shoals, Alabama. In 2013, TVA initiated a study of its real estate portfolio for the purpose of reducing cost, right-sizing the portfolio, and aligning its real estate with TVA's strategic direction over the next 10 to 20 years. As part of this effort, TVA plans to draft and implement a strategy to further reduce its Muscle Shoals property, including the disposition of 970 acres approved by the TVA Board, which it actively began marketing in 2017. TVA also completed a comprehensive assessment of its real estate holdings in the Knoxville region in 2016, including the KOC and the adjacent Summer Place Complex ("SPC"). As a result of this study and a subsequent environmental assessment in 2017, TVA is planning to consolidate most of its Knoxville area employees into one location in the West Tower of the KOC and plans to convey the SPC and the East Tower of the KOC. Evaluation of the real estate portfolio is continuing.

### Disposal of Property

Under the TVA Act, TVA has broad authority to dispose of personal property but only limited authority to dispose of real property. The primary, but not exclusive, sources of TVA's authority to dispose of real property are briefly described below:

- Under Section 31 of the TVA Act, TVA has authority to dispose of surplus real property at a public auction;
- Under Section 4(k) of the TVA Act, TVA can dispose of real property for certain specified purposes, including providing replacement lands for certain entities whose lands were flooded or destroyed by dam or reservoir

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construction and to grant easements and rights-of-way upon which are located transmission or distribution lines; and Under Section 15d(g) of the TVA Act, TVA can dispose of real property in connection with the construction of generating plants or other facilities under certain circumstances.

Additionally, under 40 U.S.C. § 1314, TVA has authority to grant easements for rights-of-way and other purposes.

The Basic Tennessee Valley Authority Power Bond Resolution adopted by the TVA Board on October 6, 1960, as amended on September 28, 1976, October 17, 1989, and March 25, 1992 (the "Basic Resolution"), prohibits TVA from mortgaging any part of its power properties and from disposing of all or any substantial portion of these properties unless TVA provides for a continuance of the interest, principal, and sinking fund payments due and to become due on all outstanding Bonds, or for the retirement of such Bonds.

Bellefonte Nuclear Plant. On November 14, 2016, following a public auction, TVA entered into a contract to sell substantially all of its Bellefonte site to Nuclear Development, LLC for \$111 million. Nuclear Development, LLC paid TVA \$22

million on November 14, 2016, with the remaining \$89 million due at closing. Nuclear Development, LLC has up to two years from November 14, 2016, to close on the property, and TVA will maintain the site until then. The closing is subject to, among other conditions, a determination by TVA's Chief Executive Officer that potential environmental impacts have been appropriately addressed or are acceptable. TVA's CEO made this determination in the affirmative on August 10, 2017. See Note 7 — Deferred Nuclear Generation Units.

Muscle Shoals Property. In alignment with its strategic direction of right-sizing its real estate portfolio, TVA has drafted a strategy to further reduce a significant number of buildings and property in Muscle Shoals, Alabama, including the disposition of 900 acres of the 970 acres approved by the TVA Board in 2012. Active marketing efforts began in March 2017, and TVA is receiving interest from local groups with the ability to promote local economic growth in the area. Depending on interest, TVA plans to auction the 900 acres.

### ITEM 3. LEGAL PROCEEDINGS

From time to time, TVA is party to or otherwise involved in lawsuits, claims, proceedings, investigations, and other legal matters ("Legal Proceedings") that have arisen in the ordinary course of conducting TVA's activities, as a result of catastrophic events or otherwise. While the outcome of the Legal Proceedings to which TVA is a party cannot be predicted with certainty, any adverse outcome to a Legal Proceeding involving TVA may have a material adverse effect on TVA's cash flows, results of operations, and financial condition.

For a discussion of Legal Proceedings involving TVA, see Note 8 and Note 21 — Legal Proceedings, which discussions are incorporated by reference into this Item 3.

### ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

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PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Not applicable.



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## ITEM 6. SELECTED FINANCIAL DATA

The following selected financial data for the years 2013 through 2017 should be read in conjunction with the audited financial statements and notes thereto (collectively, the "Consolidated Financial Statements") presented in Item 8, Financial Statements and Supplementary Data. Certain reclassifications have been made to the 2013, 2014, and 2015 financial statement presentations to conform to the 2016 and 2017 presentations.

Selected Financial Data<sup>(1)(2)</sup>

For the years ended, or at, September 30

(dollars in millions)

	2017	2016	2015	2014	2013
Sales (millions of kWh)	152,362	155,855	158,163	158,057	161,925
Peak load (MW) <sup>(3)</sup>	29,899	29,824	32,751	33,352	28,726
Operating revenues	\$10,739	\$10,616	\$11,003	\$11,137	\$10,956
Fuel expense	\$2,169	\$2,126	\$2,444	\$2,730	\$2,820
Purchased power expense	\$991	\$964	\$950	\$1,094	\$1,027
Operating and maintenance expense	\$3,362	\$2,842	\$2,838	\$3,341	\$3,428
Net interest expense	\$1,346	\$1,136	\$1,133	\$1,169	\$1,226
Net income	\$685	\$1,233	\$1,111	\$469	\$271
Construction expenditures	\$2,153	\$2,710	\$2,850	\$2,384	\$2,051
Total assets	\$50,017	\$50,494	\$48,745	\$45,514	\$46,015
Financial obligations					
Long-term debt, net <sup>(4)</sup>					
Long-term power bonds, net	\$20,205	\$20,901	\$22,617	\$21,880	\$22,239
Long-term debt of variable interest entities, net	\$1,164	\$1,199	\$1,233	\$1,265	\$1,296
Long-term notes payable	\$69	\$48	\$—	\$—	\$—
Total long-term debt, net	\$21,438	\$22,148	\$23,850	\$23,145	\$23,535
Current debt, net <sup>(4)</sup>					
Short-term debt, net	\$1,998	\$1,407	\$1,034	\$596	\$2,432
Current maturities of power bonds	\$1,728	\$1,555	\$32	\$1,032	\$32
Current maturities of long-term debt of variable interest entities	\$36	\$35	\$33	\$32	\$30
Current maturities of notes payable	\$53	\$27	\$—	\$—	\$—
Total current debt, net	\$3,815	\$3,024	\$1,099	\$1,660	\$2,494
Total debt <sup>(4)</sup>	\$25,253	\$25,172	\$24,949	\$24,805	\$26,029
Capital leases <sup>(5)</sup>	\$187	\$181	\$105	\$109	\$43
Leaseback obligations	\$339	\$467	\$616	\$691	\$761

Energy prepayment obligations	\$ 110	\$ 210	\$ 310	\$ 410	\$ 510
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Notes

(1) See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations for a description of certain items in 2017, 2016, and 2015 affecting results in those years.

(2) See Item 1A, Risk Factors and Note 21 for a discussion of risks and contingencies that could affect TVA's future financial results.

(3) TVA met an all-time summer peak demand of 33,482 MW on August 16, 2007, at 102 degrees Fahrenheit and an all-time winter peak demand of 33,352 MW on January 24, 2014, at 7.3 degrees Fahrenheit.

(4) See Note 10 and Note 13 — Debt Outstanding.

(5) Included in Accounts payable and accrued liabilities and Other long-term liabilities on the consolidated balance sheets.

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ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

(Dollars in millions except where noted)

The following Management's Discussion and Analysis of Financial Condition and Results of Operations ("MD&A") is intended to help the reader understand the Tennessee Valley Authority ("TVA"), its operations, and its present business environment. The MD&A is provided as a supplement to, and should be read in conjunction with, TVA's consolidated financial statements and the accompanying notes thereto contained in Item 8, Financial Statements and Supplementary Data of this Annual Report on Form 10-K for the fiscal year ended September 30, 2017 (the "Annual Report"). The MD&A includes the following sections:

• **Business and Mission** - a general description of TVA's business, objectives, strategic priorities, and core capabilities;

• **Executive Overview** - a general overview of TVA's activities and results of operations for 2017;

• **Results of Operations** - an analysis of TVA's consolidated results of operations for the three years presented in its consolidated financial statements;

• **Liquidity and Capital Resources** - an analysis of cash flows, a description of aggregate contractual obligations, and an overview of financial position;

• **Key Initiatives and Challenges** - an overview of current and future initiatives and challenges facing TVA;

• **Critical Accounting Policies and Estimates** - a summary of accounting policies that require critical judgments and estimates;

• **Fair Value Measurements** - a description of TVA's investments and derivative instruments and valuation considerations;

• **Legislative and Regulatory Matters** - a summary of laws and regulations that may impact TVA; and

• **Risk Management Activities** - a description of TVA's risk governance and exposure to various market risks.

**Business and Mission**

**Business**

TVA operates the nation's largest public power system. At September 30, 2017, TVA provided electricity to approximately 50 large industrial customers, seven federal agency customers, and 154 local power company customers of TVA ("LPCs") that serve over nine million people in parts of seven southeastern states. TVA generates nearly all of its revenues from the sale of electricity, and in 2017 revenues from the sale of electricity totaled \$10.6 billion. As a wholly-owned agency and instrumentality of the United States, however, TVA differs from other electric utilities in a number of ways:

• TVA is a government corporation.

• The area in which TVA sells power is limited by the Tennessee Valley Authority Act of 1933, as amended (the "TVA Act"), under a provision known as the "fence"; however, another provision of federal law known as the "anti-cherry-picking" provision generally protects TVA from being forced to provide access to its transmission lines to



others for the purpose of delivering power to customers within substantially all of TVA's defined service area.

The rates TVA charges for power are set solely by the TVA Board of Directors (the "TVA Board") and are not set or reviewed by another entity, such as a public utility commission. In setting rates, however, the TVA Board is charged by the TVA Act to have due regard for the primary objectives of the TVA Act, including the objective that power be sold at rates as low as feasible.

TVA is not authorized to raise capital by issuing equity securities. TVA relies primarily on cash from operations and proceeds from power program borrowings to fund its operations and is authorized by the TVA Act to issue bonds, notes, or other evidences of indebtedness ("Bonds") in an amount not to exceed \$30.0 billion outstanding at any given time. Although TVA's operations were originally funded primarily with appropriations from Congress, TVA has not received any appropriations from Congress for any activities since 1999 and, as directed by Congress, has funded essential stewardship activities primarily with power revenues.

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TVA's Mission of Service

TVA was built for the people, created by Congress, and charged with a unique mission - to improve the quality of life in a seven-state region through the integrated management of the region's resources. TVA's mission focuses on three key areas:

ENERGY ENVIRONMENT ECONOMIC DEVELOPMENT

Energy - Delivering affordable, reliable power;

Environment - Caring for the region's natural resources; and

Economic Development - Creating sustainable economic growth.

While TVA's mission has not changed since it was established in 1933, the climate in which TVA operates continues to evolve. The business and economic environment has become more challenging due to economic conditions, tougher environmental standards, and the need to diversify its power supply and adapt to changing customer usage behaviors, new technologies, and emerging, non-traditional competition. To continue TVA's mission of service, it must realize four strategic imperatives through people performance excellence:

Rates - Maintain low rates;

Stewardship - Be responsible stewards;

Debt - Live within its means;

Asset Portfolio - Meet reliability expectations and provide a balanced portfolio; and

People Performance Excellence - Continuously improve, empower, and engage employees.

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TVA's mission sets the stage for its strategic planning process that includes strategic objectives, initiatives, and scorecards for performance designed to provide clear direction for improving TVA's core business.

## Linking the Mission to Performance

TVA has formulated key performance measures to support its strategic imperatives. The intent of these measures is to align employees to TVA's mission by focusing its collective efforts on operational excellence, fiscal responsibility, and economic development and environmental stewardship. The measures are designed to promote teamwork, encourage high performance behaviors, and motivate TVA employees to achieve goals aligned with TVA's mission and values. The 2017 corporate results compared with targets for these key measures are reflected in the chart below. See Item 11, Executive Compensation — Compensation Discussion and Analysis for information regarding how the measures are calculated.

Corporate Measure	Weight	Actual	Threshold	Target	Stretch
Load not served (system minutes)	20%	4.3%	4.7%	3.9%	3.4%
TVA total spending (\$ millions)	25%	\$4,917	\$5,675	\$5,508	\$5,341
Nuclear unit capability factor (UCF) (%)	25%	90.7%	89.8%	90.3%	90.8%
Coal seasonal equivalent forced outage rate (%)	10%	14.5%	5.9%	4.6%	4.1%
Combined cycle seasonal equivalent forced outage rate (%)	10%	3.2%	2.4%	1.5%	0.9%
Project Milestones (%)	10%	100.0%	93%	96%	100%

## Executive Overview

TVA's net income for the years ended September 30, 2017 and 2016, was \$685 million and \$1.2 billion, respectively. Sales of electricity decreased slightly for the year ended September 30, 2017, as compared to the prior year, as TVA experienced milder weather for much of 2017. The decrease in sales was driven by lower sales to local power company customers ("LPCs") who are more weather sensitive and was partially offset by sales to industrial customers, which increased for a second year. Revenue from the sales of electricity increased \$125 million for the year ended September 30, 2017, as compared to the prior year, due to higher fuel cost recoveries and an increase in non-fuel base rates. Operating and maintenance costs increased \$520 million for the year ended September 30, 2017, as compared to the prior year primarily due to an additional \$500 million contribution to TVA's pension plan.

During 2017, TVA continued to move to a more balanced generating portfolio providing more clean, reliable, and affordable energy. Two generation projects, Watts Bar Nuclear Plant ("Watts Bar") Unit 2 and natural gas-fired Paradise Combined Cycle Plant ("Paradise CC"), were declared commercially operational, and a request for a 465 MW extended power uprate ("EPU") project at Browns Ferry Nuclear Plant ("Browns Ferry") was approved by the Nuclear Regulatory Commission ("NRC"). The natural gas-fired Allen Combined Cycle Plant ("Allen CC") began pre-commercial operation in September 2017 and is expected to be completed in the spring of 2018. With the completion of Paradise CC and Allen CC, coal-fired units at these plants are being retired except for one unit at Paradise. TVA also expanded its renewable energy supply by beginning to purchase power under a 75 MW contract for solar power from a facility in northern Alabama as well as developing TVA's first solar venture, a one MW, self-constructed solar energy facility at its Allen site. With the completion of these projects, TVA will have added over 3,700 MW of clean energy capacity and retired approximately 2,000 MW of coal-fired generation capability. TVA also plans to retire Units 1-4 of Johnsonville Fossil Plant by December 31, 2017, further reducing its coal-fired generation capacity by 428 MW. TVA does not foresee needing additional large, base-load generation units for at least the next decade.

In addition, the installation of two selective catalytic reduction systems ("SCRs") at the Gallatin Fossil Plant ("Gallatin") was completed during 2017, while work on two additional SCRs at Gallatin, as well as work on the emissions reduction equipment for Units 1 and 4 at the Shawnee Fossil Plant ("Shawnee"), is continuing. The scrubbers and SCRs are expected to be operational in 2018. Because of a strong financial position in 2017 helped by greater operating efficiencies, TVA was able to fund capital investments for these and other projects primarily from

operating funds instead of increasing debt.

In May 2017, the TVA Board approved a \$300 million multi-year, strategic fiber initiative that is expected to expand TVA's fiber capacity and improve the reliability and resiliency of the transmission system. The network expansion is expected to help meet the power system's growing need for bandwidth as well as accommodate the integration of new, distributed energy resources ("DER"). With these upgrades to its transmission system, TVA has the potential to make some fiber capacity available to help local communities and rural areas attract and retain jobs in support of economic development partnerships among TVA, the Tennessee Valley states, LPCs, and other service providers. During 2017, TVA's economic development efforts attracted and encouraged expansion of business and industries in the Tennessee Valley with over \$8.3 billion in investments and approximately 70,000 jobs created or retained. TVA also continues to achieve 99.999 percent reliability in delivering energy to its customers.

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In accordance with dam safety assurance initiatives, TVA completed the assessments of 49 dam structures which it began in 2013. Results of the assessments identified areas for further studies at several TVA dams, including Boone Dam and Pickwick Landing Dam ("Pickwick") where remediation work is in progress.

Environmental groups and state regulatory agencies are increasing their attention on alleged groundwater contamination associated with coal combustion residuals ("CCRs") management activities. As a result, TVA may have to change how it manages CCRs at some of its plants. This challenge is not unique to TVA, as others in the electric utility industry are facing the same issues.

Consistent with national trends, energy demand in the areas served by TVA and its LPCs has not been growing and has been essentially flat over the past five years. TVA anticipates this trend to continue as technological advances and consumer demand for energy efficiencies and distributed energy increase. To accommodate this trend, TVA is working with its LPC customers to adjust rate structures, pricing, and programs to ensure TVA's continued strong financial health and its ability to meet customer needs. By making TVA more efficient and adapting to the changing marketplace through a diversified energy portfolio including DER, TVA can maintain low rates and provide reliable service to its customers and consumers.

Results of Operations

Sales of Electricity

Sales of electricity accounted for nearly all of TVA's operating revenues in 2017, 2016, and 2015. TVA sells power at wholesale rates to LPCs that resell the power to their customers at retail rates. TVA also sells power to directly served customers, consisting primarily of federal agencies and customers with large or nonstandard loads. In addition, power that exceeds the needs of the TVA system is sold under exchange power arrangements with certain other power systems.

The following chart compares TVA's energy sales statistics for the years ended September 30, 2017, 2016, and 2015:

Sales of Electricity  
For the years ended  
September 30  
(millions of kWh)

Notes

(1) Includes approximately 857 million kWh of pre-commercial generation at Watts Bar Unit 2, Paradise Combined Cycle Plant, and Allen Combined Cycle Plant. See Note 1 — Pre-Commercial Plant Operations.

(2) Includes approximately 579 million kWh of pre-commercial generation at Watts Bar Unit 2. See Note 1 — Pre-Commercial Plant Operations.

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Weather affects both the demand for TVA power and the price for that power. TVA uses degree days to measure the impact of weather on its power operations. Degree days measure the extent to which average temperatures in the five largest cities in TVA's service area vary from 65 degrees Fahrenheit.

Degree  
Day  
Variation  
from  
Normal  
For the  
years  
ended  
September  
30  
Below  
Normal  
Above  
Normal  
Notes

\* Normal heating degree days for the years ended September 30, 2017, 2016, and 2015 were 3,360, 3,381, and 3,360, respectively. Actual heating degree days for the years ended September 30, 2017, 2016, and 2015 were 2,378, 2,634, and 3,555, respectively. The 2016 normal heating degree days differ from 2017 and 2015 due to the occurrence of a leap year in 2016.

\*\* Normal cooling degree days for the years ended September 30, 2017, 2016, and 2015 were 1,863. Actual cooling degree days for the years ended September 30, 2017, 2016, and 2015 were 2,007, 2,360, and 2,032, respectively.

2017 Compared to 2016

Sales of electricity decreased approximately two percent for the year ended September 30, 2017, as compared to the prior year, primarily due to decreased sales volume for LPCs driven primarily by a 12 percent decrease in total degree days. Additionally, a decrease in sales to federal agencies and other occurred primarily as a result of a decrease in off-system sales, as TVA had less excess generation available for sale to the market as compared to the prior year. Partially offsetting these decreases was an increase in sales to industries directly served as a result of increased production of customers in the polysilicon, metal, and chemical sectors.

2016 Compared to 2015

Sales of electricity decreased 1.5 percent for the year ended September 30, 2016, as compared to the prior year, primarily on account of decreased sales volume for LPCs resulting from a 26 percent decrease in heating degree days due to the polar vortex in the winter of 2015. Additionally, a decrease in sales to federal agencies and other occurred primarily as a result of a decrease in off-system sales, as TVA had less excess generation available for sale to the market as compared to the prior year. Partially offsetting these decreases was an increase in sales to industries directly served as a result of two customers increasing production at their facilities.

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## Financial Results

The following table compares operating results for 2017, 2016, and 2015:

Summary Consolidated Statements of  
Operations

	2017	2016	2015
Operating revenues	\$10,739	\$10,616	\$11,003
Operating expenses	8,764	8,290	8,788
Operating income	1,975	2,326	2,215
Other income, net	56	43	29
Net interest expense	1,346	1,136	1,133
Net income	\$685	\$1,233	\$1,111

Operating Revenues. Operating revenue components as a percentage of total operating revenues for 2017, 2016, and 2015 consisted of the following:

Operating Revenues  
For the years ended  
September 30

## Notes

(1) Excludes a contra-revenue amount of approximately \$22 million representing revenue capitalized during pre-commercial operations at Watts Bar Unit 2, Paradise Combined Cycle Plant, and Allen Combined Cycle Plant. See Note 1 — Pre-Commercial Plant Operations.

(2) Excludes a contra-revenue amount of approximately \$18 million representing revenue capitalized during pre-commercial operations at Watts Bar Unit 2. See Note 1 — Pre-Commercial Plant Operations.

The rate structure in effect provides price signals intended to reflect higher cost periods to serve LPCs and their end-use customers. Under this structure, weather can positively or negatively impact both volume and effective rates. This is because the wholesale structure includes two components: a demand charge and an energy charge. The demand charge is based on the customer's peak monthly usage and increases as the peak increases. The energy charge is based on the kilowatt hours ("kWh") used by the customer. The rate structure also includes a separate fuel rate that includes the costs of natural gas, fuel oil, purchased power, coal, emission allowances, nuclear fuel, and other fuel-related commodities; realized gains and losses on derivatives purchased to hedge the costs of such commodities; and tax equivalents associated with the fuel cost adjustments.

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The changes in revenue components are summarized below:

	2017	Variance 2017 vs 2016		Variance 2016 vs 2015	
		2016		2015	
Base revenue	\$7,499 <sup>(1)</sup>	\$ 31	\$7,468 <sup>(2)</sup>	\$(56 )	\$7,524
Fuel cost recovery	3,081	95	2,986	(319 )	3,305
Off-system sales	6	(1 )	7	(11 )	18
Revenue from sales of electricity	10,586	125	10,461	(386 )	10,847
Other revenue	153	(2 )	155	(1 )	156
Total operating revenues	\$10,739	\$ 123	\$10,616	\$(387 )	\$11,003

## Notes

(1) Includes the impact of revenue capitalized during pre-commercial operations of approximately \$22 million for the year ended September 30, 2017, at Watts Bar Unit 2, Paradise Combined Cycle Plant, and Allen Combined Cycle Plant. See Note 1 — Pre-Commercial Plant Operations.

(2) Includes the impact of revenue capitalized during pre-commercial operations of approximately \$18 million for the year ended September 30, 2016, at Watts Bar Unit 2. See Note 1 — Pre-Commercial Plant Operations.

## 2017 Compared to 2016

Operating revenues increased \$123 million for the year ended September 30, 2017, as compared to the prior year, primarily due to a \$95 million increase in fuel cost recovery revenues and a \$31 million increase in base revenue. The \$95 million increase in fuel cost recovery revenues reflects a \$160 million increase attributable to higher fuel rates partially offset by a \$65 million decrease attributable to lower energy sales. The higher fuel rates experienced were primarily driven by higher market prices for natural gas and a change in the mix of generation resources, including significantly less hydroelectric generation. The \$31 million increase in base revenue was predominantly driven by an increase of \$280 million attributable to higher effective rates during the year ended September 30, 2017, as compared to the prior year, due to the base rate adjustment that became effective October 1, 2016, partially offset by a decrease of \$246 million resulting from lower sales volume. In addition, this increase in base revenue was partially offset by the capitalization of approximately \$22 million of revenue resulting from pre-commercial generation at Watts Bar Unit 2 and Paradise and Allen Combined Cycle Plants. See Note 1 — Pre-Commercial Plant Operations.

## 2016 Compared to 2015

Operating revenues decreased \$387 million for the year ended September 30, 2016, as compared to the prior year, primarily due to a \$319 million decrease in fuel cost recovery revenues and a \$56 million decrease in base revenue. The \$319 million decrease in fuel cost recovery revenues reflects a \$279 million decrease attributable to lower fuel rates and a \$40 million decrease attributable to lower energy sales. The lower fuel rates experienced were primarily driven by favorable market prices for natural gas and a change in the mix of generation resources. The \$56 million decrease in base revenue was predominantly driven by a decrease of \$105 million resulting from lower sales volume during the year ended September 30, 2016, as compared to the prior year. In addition, the capitalization of approximately \$18 million of revenue, resulting from pre-commercial generation at Watts Bar Unit 2, contributed to the decrease in base revenue. See Note 1 — Pre-Commercial Plant Operations. These decreases in base revenue were partially offset by an increase of approximately \$67 million attributable to higher effective rates resulting primarily from the base rate adjustment that became effective October 1, 2015. The increase attributable to the rate adjustment was partially offset by lower levels of peak customer usage due to the milder winter weather experienced during the year ended September 30, 2016, as compared to the prior year.

See Sales of Electricity above for further discussion of the change in the volume of sales of electricity and Operating Expenses below for further discussion of the change in fuel expense.





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Operating Expenses. Operating expense components as a percentage of total operating expenses for 2017, 2016, and 2015 consisted of the following:

The following table summarizes TVA's expenses for various fuels for the years indicated:

Fuel Expense for TVA-Owned Facilities<sup>(1)</sup>

For the years ended September 30

	Fuel Expense By Source			Cost per kWh		
	2017	2016	2015	2017	2016	2015
Coal <sup>(2)</sup>	\$1,060	\$1,275	\$1,564	2.71	2.77	2.84
Natural gas and/or oil-fired <sup>(3)</sup>	706	632	611	2.78	2.51	3.25
Nuclear fuel	334	277	273	0.57	0.52	0.50
Total fuel <sup>(4)</sup>	\$2,100	\$2,184	\$2,448	1.70	1.76	1.91

## Notes

(1) Excludes effects of the fuel cost adjustment deferrals and amortization on fuel expense in the amounts of \$69 million, \$(58) million, and \$(4) million for the years ended September 30, 2017, 2016, and 2015, respectively.

(2) Fuel expense related to oil consumed for startup at coal-fired facilities was \$18 million, \$21 million, and \$30 million for the years ended September 30, 2017, 2016, and 2015, respectively.

(3) Fuel expense related to oil consumed for generation at natural gas and/or oil-fired facilities was \$2 million, \$2 million, and \$6 million for the years ended September 30, 2017, 2016, and 2015, respectively.

(4) Total cost per kWh is based on a weighted average.

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The following table shows TVA's generation and purchased power by generating source as a percentage of all electrical power generated and purchased (based on kWh) for the periods indicated:

## Power Supply from TVA-Operated Generation Facilities and Purchased Power

For the years ended September 30

(millions of kWh)

	2017		2016		2015	
Coal-fired	39,019	25 %	46,028	29 %	56,017	34 %
Nuclear <sup>(1)</sup>	58,742	38 %	52,897	33 %	54,543	34 %
Hydroelectric	10,967	7 %	12,618	8 %	13,812	9 %
Natural gas and/or oil-fired <sup>(2)</sup>	25,485	16 %	25,221	16 %	17,893	11 %
Renewable resources (non-hydro)	—	— %	—	— %	—	— %
Total TVA-operated generation facilities	134,213	86 %	136,764	86 %	142,265	88 %
Purchased power (non-renewable) <sup>(3)</sup>	13,586	9 %	13,807	9 %	9,788	6 %
Purchased power (renewable)	7,127	5 %	8,300	5 %	9,049	6 %
Total power supply	154,926	100 %	158,871	100 %	161,102	100 %

## Notes

(1) The nuclear generation amount for the years ended September 30, 2017 and 2016 includes approximately 495 million kWh and 579 million kWh, respectively, of pre-commercial generation at Watts Bar Unit 2. See Note 1 — Pre-Commercial Plant Operations.

(2) The natural gas and/or oil-fired generation amount for the year ended September 30, 2017, includes approximately 362 million kWh of pre-commercial generation at Paradise and Allen Combined Cycle Plants. See Note 1 — Pre-Commercial Plant Operations.

(3) Purchased power amounts include generation from Caledonia Combined Cycle Plant, which is currently a leased facility operated by TVA. Generation from Caledonia Combined Cycle Plant was 4,276 million kWh, 4,532 million kWh, and 3,173 million kWh for the years ended September 30, 2017, 2016 and 2015, respectively.

## 2017 Compared to 2016

## Fuel

Fuel expense increased \$43 million for the year ended September 30, 2017, as compared to the prior year. The impact of higher effective fuel rates, driven by changes in the mix of generation resources, including less hydroelectric generation, and higher market prices for natural gas, contributed approximately \$84 million to the increase. As an indication of the general market direction, the average Henry Hub natural gas spot price for the year ended September 30, 2017, was approximately 33 percent higher than the price for the same period of the prior year. Partially offsetting this increase was a \$41 million decrease in fuel expense driven by a two percent decrease in generation from TVA-owned resources.

## Purchased Power

Purchased power expense increased \$27 million for the year ended September 30, 2017, as compared to the same period of the prior year. This was primarily due to an increase of \$80 million driven by changes in the mix of generation resources purchased, including solar and natural gas, and higher market prices for natural gas. Partially offsetting this increase was a decrease of \$54 million primarily due to overall lower demand and therefore a decrease in the volume of purchased power.

## Operating and Maintenance

Operating and maintenance expense increased \$520 million for the year ended September 30, 2017, as compared to the prior year. This increase was primarily due to an additional discretionary \$500 million contribution to TVA's pension plan in 2017, which was recognized as additional pension expense. See Note 20. Additionally, nuclear refueling outage expense increased \$89 million, primarily from a significant increase in planned outage days, as compared to the prior year. These increases were partially offset by a \$26 million decrease in coal outage expense

primarily from planned outages, and a \$43 million decrease due to a reduction in workforce related to identified efficiencies and staffing changes needed to support TVA's generating fleet.

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### Depreciation and Amortization

Depreciation and amortization expense decreased \$119 million for the year ended September 30, 2017, as compared to the prior year. Implementation of a new depreciation study during the first quarter of 2017 resulted in approximately \$224 million less depreciation expense. The decrease in depreciation expense as a result of the new depreciation rates is primarily attributable to changes in retirement date assumptions for coal-fired plants and changes in the estimated service lives for transmission assets. See Note 1 — Property, Plant, and Equipment, and Depreciation — Depreciation. In addition, the retirement of Colbert Fossil Plant ("Colbert") Units 1-4 in March 2016 and Paradise Fossil Plant Units 1 and 2 in April 2017 contributed \$29 million and \$50 million, respectively, to the decrease. Partially offsetting these decreases was an increase of approximately \$184 million primarily from net additions to Completed plant, including \$133 million associated with Watts Bar Unit 2 commencing commercial operations in October 2016 and \$12 million associated with Paradise Combined Cycle Plant commencing commercial operations in April 2017.

### Tax Equivalents

Tax equivalents expense increased \$3 million for the year ended September 30, 2017, as compared to the same period of the prior year. This change primarily reflects an increase in the accrued tax equivalent expense related to the fuel cost adjustment mechanism. The accrued tax equivalent expense is equal to five percent of the fuel cost adjustment mechanism revenues and increased for the year ended September 30, 2017, as compared to the same period of the prior year.

## 2016 Compared to 2015

### Fuel

Fuel expense decreased \$318 million for the year ended September 30, 2016, as compared to the prior year. The decrease in fuel expense was due in part to favorable market prices for natural gas and a change in the mix of generation resources, including less hydroelectric generation, which collectively contributed approximately \$169 million to the decrease. As an indication of general market direction, the average Henry Hub natural gas spot price for the year ended September 30, 2016, was approximately 26 percent lower than the prior year. Additionally, a three percent decrease in generation from TVA-owned resources contributed approximately \$95 million to the decrease in fuel expense.

### Purchased Power

Purchased power expense increased \$14 million for the year ended September 30, 2016, as compared to the prior year. An increase of 17 percent in the volume of power purchased for the year ended September 30, 2016, as compared to the prior year contributed approximately \$165 million to the increase in purchased power expense. This increase in volume was driven primarily by the favorability of natural gas prices as compared to other sources of generation, as TVA's primary source of purchased power is natural gas-fired generation. Partially offsetting this increase was a \$130 million decrease in purchased power expense due to lower rates driven by lower market prices for natural gas.

### Operating and Maintenance

Operating and maintenance expense remained essentially flat for the year ended September 30, 2016, as compared to the same period of the prior year. This was due in part to a \$42 million increase in maintenance expenses related to major projects, including dam safety and remediation projects and projects relating to natural gas-fired facilities, in the year ended September 30, 2016, as compared to the same period of the prior year. Additionally, there was an increase of approximately \$23 million in net write-offs during the year ended September 30, 2016, as compared to the same period of the prior year, primarily due to inventory and project write-offs. These increases in operating and maintenance expense were partially offset by a \$48 million decrease in planned outage expense, primarily due to the timing and efficiencies of planned nuclear outages and decreased planned coal outages during the year ended September 30, 2016, as compared to the same period of the prior year. Additionally, there was a decrease of \$12 million in fuel-related operating and maintenance expense primarily as a result of lower coal generation during the

year ended September 30, 2016, as compared to the same period of the prior year.

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## Depreciation and Amortization

Depreciation and amortization expense decreased \$195 million for the year ended September 30, 2016, as compared to the prior year. The decrease was primarily a result of approximately \$294 million less depreciation expense driven by the retirement of Widows Creek Unit 7 in September 2015 and Colbert Units 1-4 in March 2016. In addition, there was a \$79 million decrease in depreciation and amortization expense related to the 20-year license extension for Sequoyah Nuclear Plant ("Sequoyah"). Partially offsetting these decreases was an increase of \$100 million in the amortization of the non-nuclear decommissioning regulatory asset and an increase of approximately \$77 million primarily from net additions to Completed plant. See Note 1 — Property, Plant, and Equipment, and Depreciation — Depreciation.

## Tax Equivalents

Tax equivalents expense decreased \$3 million for the year ended September 30, 2016, as compared to the same period of the prior year. This change primarily reflects a decrease in the accrued tax equivalent expense related to the fuel cost adjustment mechanism. The accrued tax equivalent expense is equal to five percent of the fuel cost adjustment mechanism revenues and decreased for the year ended September 30, 2016, as compared to the same period of the prior year.

Interest Expense. Interest expense and interest rates for 2017, 2016, and 2015 were as follows:

## Interest Expense and Rates

For the years ended September 30

	2017	Percent Change	2016	Percent Change	2015
Interest expense <sup>(1)</sup>					
Interest expense	\$1,346	(1.8 )%	\$1,371	1.8 %	\$1,347
Allowance for funds used during construction	—	(100.0)%	(235 )	9.8 %	(214 )
Net interest expense	\$1,346	18.5 %	\$1,136	0.3 %	\$1,133
Average blended interest rate	5.11 %	(0.8 )%	5.15 %	(0.2 )%	5.16 %

Note

(1) Interest expense includes amortization of debt discounts, issuance, and reacquisition costs, net.

## 2017 Compared to 2016

Net interest expense increased \$210 million for the year ended September 30, 2017, as compared to the prior year. During the year ended September 30, 2016, TVA capitalized \$235 million in allowance for funds used during construction ("AFUDC") related to the Watts Bar Unit 2 construction project. TVA ceased capitalizing allowance for funds used during construction after September 2016. Interest expense excluding AFUDC was \$25 million lower for the year ended September 30, 2017, as compared to the prior year, primarily due to lower interest rates on long-term debt.

## 2016 Compared to 2015

Net interest expense increased \$3 million for the year ended September 30, 2016, as compared to prior year. This increase was attributable to an increase in interest expense of \$24 million primarily due to interest associated with certain other financing obligations. The increase was partially offset by an increase of \$21 million in AFUDC as a result of ongoing construction activities at Watts Bar Unit 2.

## Liquidity and Capital Resources

### Sources of Liquidity

To meet cash needs and contingencies, TVA depends on various sources of liquidity. TVA's primary sources of liquidity are cash from operations and proceeds from the issuance of short-term and long-term debt. Current liabilities may exceed current assets from time to time in part because TVA uses short-term debt to fund short-term cash needs, as well as to pay scheduled maturities and other redemptions of long-term debt. The daily balance of cash and cash equivalents maintained is based on near-term expectations for cash expenditures and funding needs.

In addition to cash from operations and proceeds from the issuance of short-term and long-term debt, TVA's sources of liquidity include a \$150 million credit facility with the United States Department of the Treasury ("U.S. Treasury"), four long-term



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revolving credit facilities totaling \$2.7 billion, and proceeds from other financings. See Note 13 — Credit Facility Agreements. Other financing arrangements may include sales of receivables, loans, and other assets.

The TVA Act authorizes TVA to issue Bonds in an amount not to exceed \$30.0 billion outstanding at any time. In February 2017, TVA issued \$1.0 billion of power bonds maturing in February 2027. See Note 13 — Debt Securities Activity. Power bonds outstanding, excluding unamortized discounts and premiums and net exchange losses from foreign currency transactions, at September 30, 2017, and 2016, were \$24.2 billion (including current maturities) and \$24.1 billion (including current maturities), respectively. The balance of Bonds outstanding directly affects TVA's capacity to meet operational liquidity needs and to strategically use Bonds to fund certain capital investments as management and the TVA Board may deem desirable. Other options for financing not subject to the limit on Bonds, including lease financings (see Lease Financings below and Note 10), could provide supplementary funding if needed. Currently, TVA believes that it has adequate capability to fund its ongoing operational liquidity needs and make planned capital investments over the next decade through a combination of Bonds, additional power revenues through power rate increases, cost reductions, or other ways. See Lease Financings below, Note 10, and Note 13 for additional information.

**Debt Securities.** TVA's Bonds are not obligations of the United States, and the United States does not guarantee the payments of principal or interest on Bonds. TVA's Bonds consist of power bonds and discount notes. Power bonds have maturities of between one and 50 years. At September 30, 2017, the average maturity of long-term power bonds was 16.6 years, and the average interest rate was 4.67 percent. Discount notes have maturities of less than one year. Power bonds and discount notes have a first priority and equal claim of payment out of net power proceeds. Net power proceeds are defined as the remainder of TVA's gross power revenues after deducting the costs of operating, maintaining, and administering its power properties and payments to states and counties in lieu of taxes, but before deducting depreciation accruals or other charges representing the amortization of capital expenditures, plus the net proceeds from the sale or other disposition of any power facility or interest therein. In addition to power bonds and discount notes, TVA had long-term debt associated with certain VIEs outstanding at September 30, 2017. See Lease Financings below, Note 10, and Note 13 — Credit Facility Agreements for additional information. TVA also had secured notes outstanding at September 30, 2017, that were assumed in business combinations in 2016 and asset acquisitions in 2017. See Note 13 — Secured Notes.

Power bonds and discount notes are both issued pursuant to Section 15d of the TVA Act and pursuant to the Basic Tennessee Valley Authority Power Bond Resolution adopted by the TVA Board on October 6, 1960, as amended on September 28, 1976, October 17, 1989, and March 25, 1992 (the "Basic Resolution"). The TVA Act and the Basic Resolution each contain two bond tests: the rate test and the bondholder protection test.

Under the rate test, TVA must charge rates for power which will produce gross revenues sufficient to provide funds for:

- Operation, maintenance, and administration of its power system;
- Payments to states and counties in lieu of taxes;
- Debt service on outstanding Bonds;
- Payments to the U.S. Treasury in repayment of and as a return on the government's appropriation investment in TVA's power facilities (the "Power Program Appropriation Investment"); and

Such additional margin as the TVA Board may consider desirable for investment in power system assets, retirement of outstanding Bonds in advance of maturity, additional reduction of the Power Program Appropriation Investment, and other purposes connected with TVA's power business, having due regard for the primary objectives of the TVA Act, including the objective that power shall be sold at rates as low as are feasible. See Note 17 — Appropriation Investment.

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The rate test for the one-year period ended September 30, 2017, was calculated after the end of 2017, and TVA met the test's requirements.

Under the bondholder protection test, TVA must, in successive five-year periods, use an amount of net power proceeds at least equal to the sum of the depreciation accruals and other charges representing the amortization of capital expenditures, and the net proceeds from any disposition of power facilities, for either the reduction of its capital obligations (including Bonds and the Power Program Appropriation Investment), or investment in power assets.

The bondholder protection test for the five-year period ended September 30, 2015, was calculated after the end of 2015, and TVA met the test's requirements. TVA must next meet the bondholder protection test for the five-year period ending September 30, 2020.

TVA uses proceeds from the issuance of discount notes, in addition to other sources of liquidity, to fund short-term cash needs and scheduled maturities of long-term debt.

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The following table provides additional information regarding TVA's short-term borrowings.

## Short-Term Borrowing Table

	At September 30 2017	For the year ended September 30 2017	At September 30 2016	For the year ended September 30 2016	At September 30 2015	For the year ended September 30 2015
Amount Outstanding (at End of Period) or Average Amount						
Outstanding (During Period)						
Discount notes	\$ 1,998	\$ 1,280	\$ 1,407	\$ 1,323	\$ 1,034	\$ 1,357
Weighted Average Interest Rate						
Discount notes	1.000 %	0.668 %	0.203 %	0.240 %	0.055 %	0.051 %
Maximum Month-End Amount Outstanding (During Period)						
Discount notes	N/A	\$ 2,062	N/A	\$ 1,561	N/A	\$ 2,590

TVA ended the year at September 30, 2017, with a higher balance of short-term debt than at September 30, 2016, due primarily to timing of cash flows and higher redemptions of long-term debt than in the prior year. The average balance of short-term debt was lower in 2017 than 2016 due to timing of financing activities in both years. TVA held a higher balance of short-term debt at September 30, 2016, than at September 30, 2015, due primarily to the timing of cash flows and lower issuance of long-term debt. The average balance of short-term debt was lower in 2016 than 2015 due to the timing of financing activities in both years. The variance in the average interest rate on discount notes is primarily due to changes in market conditions.

TVA generally uses proceeds from the issuance of power bonds to refinance maturing power bonds or other financing obligations, as necessary, or for other power system purposes. The total balance of power bonds may decline in periods where redemptions of power bonds exceed issuance due to net positive cash flow from operating and investing activities. TVA projects that it will reduce the balance of Bonds and other financing obligations to less than \$22.0 billion by 2023.

TVA issued \$1.0 billion of power bonds during 2017 and no power bonds during 2016. TVA redeemed \$1.6 billion and \$76 million of power bonds during 2017 and 2016, respectively. For additional information about TVA debt issuance activity and debt instruments issued and outstanding at September 30, 2017, and 2016, including rates, maturities, outstanding principal amounts, and redemption features, see Note 13 — Debt Securities Activity and Debt Outstanding.

TVA Bonds are traded in the public bond markets. TVA's Bonds are listed on the New York Stock Exchange ("NYSE") except for TVA's discount notes, the 2009 Series A and B power bonds, and the power bonds issued under TVA's electronotes<sup>®</sup> program. TVA's Puttable Automatic Rate Reset Securities are traded on the NYSE under the exchange symbols "TVC" and "TVE." Other NYSE-listed bonds are assigned various symbols by the exchange, which are noted on the NYSE's website. TVA has also listed certain bonds on foreign exchanges from time to time, including the Luxembourg, Hong Kong, and Singapore Stock Exchanges. See Item 1A, Risk Factors for additional information regarding the market for TVA's Bonds.

Although TVA Bonds are not obligations of the United States, TVA, as a corporate agency and instrumentality of the United States government, may be impacted if the sovereign credit ratings of the United States are downgraded. Additionally, TVA may be impacted by how the United States government addresses situations of approaching its statutory debt limit. According to statements made by nationally recognized credit rating agencies, downward pressure on the ratings of the United States could eventually develop if there are no changes in current policies and

budget deficits and the trajectory of debt begins to increase; additionally, current ratings factor in the prospect that debates over raising the debt ceiling of the United States government could continue to be protracted and difficult. The outlook on the ratings of the United States government and TVA is currently stable with all three agencies that provide ratings on TVA Bonds. TVA's rated senior unsecured Bonds are currently rated Aaa, AAA, and AA+. TVA's short-term discount notes are not rated.

Lease Financings. TVA has entered into certain leasing transactions with special purpose entities ("SPEs") to obtain third-party financing for its facilities. These SPEs are sometimes identified as VIEs of which TVA is determined to be the primary beneficiary. TVA is required to account for these VIEs on a consolidated basis. See Note 10 and Note 13 for information about TVA's lease financing activities, and see Note 9 for information regarding TVA's recent acquisition of equity interests in certain SPEs created for the purpose of facilitating lease financing. During 2017 and 2016, TVA acquired 100 percent of the equity interests in certain SPEs created for the purpose of facilitating lease financing. TVA may seek to enter into similar lease transactions in the future.

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Summary Cash Flows

A major source of TVA's liquidity is operating cash flows resulting from the generation and sale of electricity. There was no net change in cash and cash equivalents in 2017 and 2016. The net change was a \$200 million decrease for the year ended September 30, 2015. A summary of cash flow components for the years ended September 30 follows:

Cash provided by (used in):

Operating Activities. TVA's cash flows from operations are primarily driven by sales of electricity, fuel costs, and operating and maintenance costs. The timing and level of cash flows from operations can be affected by the weather, changes in working capital, commodity price fluctuations, outages, and other project expenses.

2017 Compared to 2016

Net cash flows provided by operating activities decreased by \$306 million for 2017 compared to 2016 due primarily to increases in cash used for pension contributions, fuel costs, and outage costs. These changes were partially offset by increases in revenue collections due to timing, the increase to the effective base rate, and additional fuel cost recovery.

2016 Compared to 2015

Net cash flows provided by operating activities decreased \$273 million in 2016 compared to 2015, primarily as a result of the timing of revenue collections, increases in decommissioning settlements, increases in purchase power due to favorability of natural gas prices, and decreases in receipts of Kingston Fossil Plant ("Kingston") ash spill insurance proceeds. These changes were partially offset by decreases in margin requirements due to lower volumes, decreases in fossil fuel inventory expenditures, and the timing of payments related to operating and maintenance activities.

Investing Activities. The majority of TVA's investing cash flows are due to investments to acquire, upgrade, or maintain generating and transmission assets, including environmental projects and the purchase of nuclear fuel.

2017 Compared to 2016

Net cash flows used in investing activities decreased by \$577 million in 2017 compared to 2016, primarily driven by the completion of Watts Bar Unit 2 in October 2016 and Paradise Combined Cycle Plant in April 2017.

2016 Compared to 2015

Net cash flows used in investing activities decreased by \$472 million in 2016 compared to 2015, primarily driven by higher spending in 2015 related to the Ackerman Combined Cycle Plant ("Ackerman") acquisition, Watts Bar Unit 2 construction, and nuclear fuel expenditures. These decreases were partially offset by increases in 2016 in capacity expansion spending for the natural gas-fired generation facility at Allen Fossil Plant ("Allen") and other capital projects.

Financing Activities. TVA's cash flows provided by or used in financing activities are primarily driven by the timing and level of cash flows provided by operating activities, cash flows used in investing activities, and net issuance and redemption of debt instruments to maintain a strategic balance of cash on hand.

2017 Compared to 2016

Net cash flows used in financing activities were \$200 million for 2017 as compared to \$71 million of net cash provided by financing activities in 2016. Increased cash flows from operations and decreased investing expenditures

reduced TVA's borrowing needs. During 2017, TVA also realized proceeds from the issuance of a \$1.0 billion power bond carrying an interest rate of 2.88 percent and a term of ten years. The proceeds from the bond issuance were used in part to redeem \$1.6 billion of

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other long-term debt, primarily power bonds. In addition, TVA had \$583 million of short-term debt net issuances for 2017 as compared to \$370 million in 2016. TVA generally uses short-term debt to meet working capital needs and other cash requirements while maintaining minimal cash balances.

## 2016 Compared to 2015

Net cash flows provided by financing activities were essentially flat in 2016 compared to 2015. Net proceeds from the issuance and redemption of debt were higher in 2016 compared to 2015 due to portfolio debt management decisions and timing of financing and investing activities. This was offset by an increase in payments on leases and leasebacks related to the settlement of lease/leaseback obligations. See Note 9.

## Cash Requirements and Contractual Obligations

The future planned capital expenditures for property, plant, and equipment additions, including clean air projects and new generation, are estimated to be as follows:

Capital Expenditures<sup>(1)</sup>

For the year ended September 30

	Actual 2017	Estimated Capital Expenditures		
		2018	2019	2020
Capacity expansion expenditures				
Allen combined cycle plant	\$210	\$162	\$—	\$—
Paradise combined cycle plant	66	5	—	—
Other capacity expansion	250	230	334	209
Environmental expenditures				
Clean air and waste water	167	128	45	11
Coal combustion residuals <sup>(2)</sup>	110	164	177	88
Transmission expenditures	385	438	457	496
Other capital expenditures <sup>(3)</sup>	888	847	872	902
Total capital expenditures	\$2,076 <sup>(4)</sup>	\$1,974	\$1,885	\$1,706

## Notes

(1) TVA plans to fund these expenditures with cash from operations and proceeds from power program financings. This table shows only expenditures that are currently planned. Additional expenditures may be required, among other things, for TVA to meet growth in demand for power in its service area or to comply with new environmental laws, regulations, or orders.

(2) Estimated capital expenditures include costs for Gallatin projects that are part of the original activities scheduled in TVA's CCR Conversion Program of approximately \$55 million, \$45 million, and \$18 million for 2018, 2019, and 2020, respectively. These amounts exclude costs related to any new requirements related to the Gallatin lawsuits. See Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Key Initiatives and Challenges — Coal Combustion Residual Facilities and Note 8.

(3) Other capital expenditures are primarily associated with short lead time construction projects aimed at the continued safe and reliable operation of generating assets.

(4) The numbers above include construction in progress expenditures accrued in Accounts payable and accrued liabilities of \$77 million.

TVA continually reviews its capital expenditures and financing programs. The amounts shown in the table above are forward-looking amounts based on a number of assumptions and are subject to various uncertainties. Amounts may differ materially based upon a number of factors, including, but not limited to, changes in assumptions about system load growth, environmental regulation, rates of inflation, total cost of major projects, and availability and cost of

external sources of capital. See Forward-Looking Information and Item 1A, Risk Factors.

In the near term, TVA's cash flows may be negatively impacted by investments in new generation, such as the combined cycle facility at the Allen site, that is not expected to contribute positively to cash flows until put into service.

TVA has certain obligations and commitments to make future payments under contracts, including contracts executed in connection with certain of the planned construction expenditures. The following table sets forth TVA's estimates of future payments at September 30, 2017. See Note 10, Note 11, Note 13, Note 20, and Note 21 for a further description of these obligations and commitments.



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## Commitments and Contingencies

## Payments due in the year ending September 30

	2018	2019	2020	2021	2022	Thereafter	Total
Debt <sup>(1)</sup>	\$3,726	\$1,032	\$30	\$1,860	\$1,028	\$16,532	\$24,208
Interest payments relating to debt <sup>(2)</sup>	1,132	1,057	1,047	1,017	966	16,146	21,365
Debt of VIEs <sup>(3)</sup>	36	38	40	41	43	1,013	1,211
Interest payments relating to debt of VIEs	56	54	52	50	49	543	804
Notes payable	53	46	23	—	—	—	122
Interest payments relating to notes payable	1	1	—	—	—	—	2
Lease obligations							
Capital <sup>(4)</sup>	52	51	51	51	51	519	775
Non-cancelable operating <sup>(5)</sup>	33	26	25	25	11	3	123
Purchase obligations							
Power <sup>(6)</sup>	252	275	268	253	231	1,351	2,630
Fuel <sup>(7)</sup>	1,431	872	498	394	212	1,008	4,415
Other <sup>(8)</sup>	203	102	29	40	61	299	734
Gallatin coal combustion residual facilities <sup>(9)</sup>	58	56	34	7	6	829	990
Environmental Agreements	2	3	1	1	1	7	15
Membership interests of variable interest entity subject to mandatory redemption	2	2	3	3	3	20	33
Interest payments related to membership interests of variable interest entity subject to mandatory redemption	2	2	2	2	2	9	19
Flood response commitment to NRC	8	20	—	—	—	—	28
Unfunded loan commitments	12	—	—	—	—	—	12
Long-term monitoring costs - Kingston ash spill	1	1	1	1	1	14	19
Payments on other financings	60	59	60	217	35	244	675
Retirement Plan <sup>(10)</sup>	300	300	300	300	300	4,200	5,700
Other contractual obligations	3	—	—	—	—	—	3
Total	\$7,423	\$3,997	\$2,464	\$4,262	\$3,000	\$42,737	\$63,883

## Notes

(1) Does not include noncash items of foreign currency exchange gain of \$125 million, unamortized debt issue costs of \$59 million, and net discount on sale of Bonds of \$93 million.

(2) Includes the effects of interest rate derivatives employed to manage interest rate risk.

(3) Debt of VIEs does not include the noncash item of unamortized debt issue costs of \$11 million.

(4) Includes the interest component of capital leases based on the interest rates stated in the lease agreements and excludes certain related executory costs. Minimum commitments related to executory costs are included in purchase obligations.

(5) Does not include purchased power agreements that are accounted for as operating leases and included in power purchase obligations.

(6) Includes commitments for energy and/or capacity under power purchase agreements from coal-fired, hydroelectric, diesel, and gas-fired facilities, as well as transmission service agreements to support purchases of power from the market.

(7) Includes commitments to purchase nuclear fuel, coal, and natural gas, as well as related transportation and storage services.

(8) Primarily includes long-term service contracts, contracts that contain minimum purchase levels for the purchase of limestone along with related storage and transportation, and contractual obligations related to load control programs.

(9) Includes \$899 million long-term liability for costs of constructing a lined facility onsite and excavating and moving the ash and \$91 million of estimated costs related to construction of a permanent bottom ash dewatering facility and wastewater process ponds. The estimated capital expenditures represent costs for Gallatin projects that are

part of the original activities scheduled in TVA's CCR Conversion Program. See Note 8.

(10) Pursuant to amendments to the TVA Retirement System ("TVARS") Rules and Regulations that became effective October 1, 2016, TVA will contribute to TVARS for a period of 20 years (2017-2036) or, if earlier, through the fiscal year in which it is determined by actuarial valuation that TVARS has reached and remained at a 100 percent funded status, an amount not less than the greater of (a) the minimum required TVARS actuarial valuation contribution or (b) \$300 million. In 2017, TVA contributed a total of \$800 million, which was \$500 million more than required under the TVARS Rules and Regulations. Although this additional \$500 million is allowed to be credited to future years to reduce future required contributions, TVA intends to continue contributing the greater of (a) the minimum required TVARS actuarial valuation contribution or (b) \$300 million.

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In addition to the obligations above, TVA has energy prepayment obligations in the form of revenue discounts. See Note 1 — Energy Prepayment Obligations.

## Energy Prepayment Obligations

Obligations due in the year ending September 30

	2018	2019	2020	2021	2022	Thereafter	Total
Energy prepayment obligations	\$100	\$10	\$ —	\$ —	\$ —		—\$110
Interest payments relating to energy prepayment obligations	46	4	—	—	—	—	50
Total	\$146	\$14	\$ —	\$ —	\$ —		—\$160

EnergyRight® Solutions Program. TVA purchases certain loans receivable from its LPCs in association with the EnergyRight® Solutions program. Depending on the nature of the energy-efficiency project, loans may have a maximum term of five years or ten years. The loans receivable are then transferred to a third-party bank with which TVA has agreed to repay in full any loan receivable that has been in default for 180 days or more or that TVA has determined is uncollectible. As of September 30, 2017, the total carrying amount of the loans receivable, net of discount, was approximately \$125 million. Such amounts are not reflected in the Commitments and Contingencies table above. The total carrying amount of the financing obligation was approximately \$144 million at September 30, 2017. See Note 6 and Note 11 for additional information.

## Off-Balance Sheet Arrangements

At September 30, 2017, TVA had no off-balance sheet arrangements.

## Key Initiatives and Challenges

## Distributed Energy Resources

The primary change for power generators in the coming years is expected to involve DER as they continue to play an increasingly strong role in the country's energy future. As technologies for producing energy using distributed solar, micro turbines, and other types of smaller scale DER are evolving, they are becoming more cost-competitive. Absorbing the previous impact of electricity from the small number of distributed generation sites was well within the capacity of a system the size of TVA's. As the amount of DER grows on the TVA system, the need for TVA's traditional generation resources may be reduced, and the ability of the system to reliably and economically operate in conjunction with these DER sources may become more challenging. To meet this challenge, TVA is working with LPCs and others on long-term pricing and product development strategies that include DER and address the implementation and support of those resources.

As it transitions away from coal to other resources, TVA continues to identify significant impacts to its transmission system that include stress on its transmission equipment, such as lines and transformers. While TVA owns and operates its high-voltage transmission grid, the distribution system is a network of grids belonging to LPCs, each with its own characteristics and operational strengths and challenges. Integrating renewable generation (primarily photovoltaic solar and combined heat and power projects) presents a number of challenges, including grid balancing and reliability. The growth of renewable resources on the distribution grid necessitates the involvement of entities in addition to TVA, especially the LPCs. TVA and LPCs will need to focus on the safety and reliability impact of these resources as they are interconnected to the grid, as well as ensuring the pricing of electricity remains as low as feasible. As generation resources become more distributed and intermittent, the need to extend secure communication networks for visibility and control becomes even more important in maintaining grid reliability.

Moving towards a more diverse resource mix, the TVA Board approved a \$300 million strategic fiber initiative in May 2017 to be spent over the next 10 years for upgrades to the transmission system to maintain reliability. By

investing in these upgrades, TVA plans to be in a position to move to more distributed power generation from many smaller sources of generation and to begin to price its products at different rates during different times of the day and season. The new fiber optic lines will also give TVA the potential to make fiber capacity available to help local communities in rural areas attract and retain jobs. Due to uncertainties related to the technology choices and market penetration rates for DER options, TVA cannot currently predict the potential financial impacts from the future growth in DER, but it is anticipated that future growth will be a part of TVA's overall strategy to meet customer demand in an evolving marketplace. See Item 1, Business — Power Supply and Load Management Resources — Distributed Energy Resources.

#### Changing Customer Preferences

As more consumers and businesses are demanding cleaner and greener energy, the utility industry is evolving to meet those needs. As TVA also evolves, it will see impacts to the way it does business from the pricing of products, transmission of energy, and development of new products and services for its customers in support of changing customer preferences and its economic development efforts. End-use customers are becoming more technologically savvy and want greater control over their energy usage. Larger companies are focusing more on sustainability and requiring more energy efficiency as well as cleaner,

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greener, renewable energy options. The continuing challenge for TVA and others is finding ways to meet the needs and preferences of customers while successfully developing flexible pricing models to accommodate the evolving markets.

TVA's Integrated Resource Plan ("IRP") considered a wide range of supply-side generating resources, including modeling energy efficiency as an energy resource, as well as a broad range of feasible demand-side options. These options were assessed with respect to financial, economic, and environmental impacts. TVA is developing and managing demand-side energy resources in collaboration with LPCs and electric customers, particularly around deployment of additional energy efficiency resources. Previously mandated energy efficiency standards have been reducing the amount of electricity used by customers and have been factored into TVA's long-range plans.

### Generation Resources

**Nuclear Response Capability.** Since the events that occurred in 2011 at the Fukushima Daiichi Nuclear Power Plant ("Fukushima Events"), the NRC adopted additional detailed guidance on the expected response capability to be developed by each nuclear plant site. The NRC issued orders that modified each plant's license to require implementation of additional external event mitigation capabilities. TVA has implemented these strategies and physical plant modifications to address the actions outlined in this guidance at Sequoyah and Watts Bar. Implementation is in progress at Browns Ferry and is scheduled to be completed in 2019. As of September 30, 2017, TVA had spent \$267 million on modifications related to these actions at all of its nuclear plants, including Watts Bar Unit 2, and expects to spend an additional \$16 million to complete the remaining modifications intended to address this guidance.

**Extreme Flooding Preparedness.** Updates to the TVA analytical hydrology model completed in 2009 indicated that under "probable maximum flood" conditions, some of TVA's dams might not have been capable of regulating the higher flood waters. A "probable maximum flood" is an extremely unlikely event; however, TVA is obligated to provide protection for its nuclear plants against such events. As a result, TVA installed a series of modifications at three of the four dams, and work on the fourth, Fort Loudoun Dam, is continuing in parallel with a Tennessee Department of Transportation project. The work being done by the State of Tennessee to support the Fort Loudoun Dam modifications is estimated to be completed by the end of CY 2017. TVA's Fort Loudoun Dam modifications are estimated to be completed in 2018. TVA is taking steps to ensure that it complies with the NRC license requirements for Watts Bar related to the completion of the project.

Since 2009, TVA has performed further hydrology modeling of portions of the TVA watershed using updated modeling tools. TVA also substantially completed a series of permanent modifications to several other dams identified through the more recent analytical work. The modifications addressed and rectified the potential for certain dams to be overtopped during a "probable maximum flood" event as well as the potential for certain other dams to become unstable under "probable maximum flood" conditions. TVA has also made various improvements to plant protection features at Watts Bar and Sequoyah.

The revised hydrology models were reviewed and approved by the NRC for Watts Bar Units 1 and 2. However, TVA identified an error in the modeling that will require TVA to resubmit models for Watts Bar Units 1 and 2. TVA plans to seek NRC approval for similar modeling for Sequoyah Units 1 and 2 and will subsequently address conditions at Browns Ferry as needed. TVA has deferred some modifications until the updated Watts Bar and Sequoyah models are completed.

As of September 30, 2017, TVA had spent \$150 million on the modifications and improvements related to extreme flooding preparedness and expects to spend up to an additional \$28 million to complete the modifications.

**NRC Seismic Assessments.** On May 9, 2014, the NRC notified licensees of nuclear power reactors in the central and eastern United States of the results of seismic hazard screening and prioritization evaluations performed by unit

owners and reviewed by the NRC staff. Because the seismic hazards for Browns Ferry, Sequoyah, and Watts Bar had increases in seismic parameters beyond the technical information available when the plants were designed and licensed, TVA must conduct seismic risk evaluations for these plants. TVA completed the risk evaluation for Watts Bar and submitted it to the NRC on June 30, 2017; the evaluation concluded that no additional actions were required. The evaluations for Browns Ferry and Sequoyah are due by December 31, 2019.

**Mitigation of Beyond-Design-Basis Events.** NRC rulemaking has been developed to codify the requirements promulgated by orders related to beyond-design-basis flooding and seismic events discussed above. The NRC staff submitted the draft final rule — Mitigation of Beyond-Design-Basis Events — to the NRC Commission on December 15, 2016, requesting approval to publish the final rule. The final rule is expected to be issued in late CY 2017 or early CY 2018. Minimal changes between the orders and final rule requirements are expected. Once issued, TVA will review the final rule to identify any gaps to compliance. Gaps could result in TVA having to make modifications to one or more of its nuclear plants. Cost estimates for any required modifications cannot be developed until after the rule is finalized, but costs for modifications could be substantial. See Extreme Flooding Preparedness and NRC Seismic Assessments above.

**Baffle-Former Bolt Degradation.** In July 2016, Westinghouse Electric Co., LLC ("Westinghouse") issued a Nuclear Safety Advisory Letter ("NSAL") 16-01 that addresses recently identified degradation of baffle-former bolts in some U.S. pressurized water reactors ("PWRs"). Baffle-former bolts help hold together a structure inside certain reactor vessels. Sequoyah Units 1 and 2, both PWRs, are referenced in the NSAL. Visual inspections of baffle-former bolts in Sequoyah Units 1

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and 2 during 2017 refueling outages showed no degradation of baffle-former bolts. TVA is planning to complete ultrasonic inspections during the Sequoyah Unit 1 refueling outage in the spring of 2018 and the Sequoyah Unit 2 refueling outage in the fall of 2018.

**Potential Issues Involving Nuclear Components.** On January 10, 2017, the NRC released a list of nuclear units that are potentially impacted by AREVA components forged by Le Creusot Forge in France. Sequoyah Unit 1 and Watts Bar Unit 1 are included in the list because they received steam generator components from Le Creusot Forge. Two separate issues relating to the AREVA components were identified. One issue involves the level of carbon in some forgings, which may compromise the components' structural integrity over time. Neither the NRC nor AREVA has found any safety concerns with the steam generator components produced by Le Creusot Forge. Additionally, Westinghouse, which supplied the components to TVA, has notified TVA that there are no known issues with the components Westinghouse received from Le Creusot Forge, and TVA is not aware of any issues with the components. TVA will participate with industry working groups investigating the forging issue. The other issue involves apparent documentation discrepancies which do not appear to have affected TVA.

**Work Environment at Nuclear Plants.** In March 2016, the NRC issued a Chilling Effect Letter ("CEL") to TVA regarding work environment concerns identified at Watts Bar. In subsequent inspections, the NRC found that Watts Bar still faces challenges in maintaining a safety conscious work environment. On April 12, 2017, TVA provided the NRC with an updated letter outlining focus areas and metrics for monitoring performance at Watts Bar. In that letter, TVA made a formal commitment to the NRC to conduct a safety culture assessment at Watts Bar in CY 2017, which it has completed. On November 2, 2017, the NRC held a public meeting where TVA presented the progress in addressing the issues. TVA is working to implement the fleet-wide actions as documented in the Confirmatory Order issued on July 27, 2017, that will ensure sustainable improvements in safety culture.

**Watts Bar Unit 2.** Watts Bar Unit 2 commenced commercial operations on October 19, 2016. Project costs were \$4.7 billion and were within the limit approved by the TVA Board in January 2016.

TVA was a cooperating agency in the February 2016 Department of Energy ("DOE") Final Supplemental Environmental Impact Statement for the Production of Tritium in a Commercial Light Water Reactor. On April 5, 2017, due to an anticipated need for more tritium-producing burnable absorber rods ("TPBARs"), the DOE announced its preferred alternative for irradiation services, which included use of an additional reactor. As a result of TVA's assessment and concurrence with the DOE's alternative, TVA is planning to submit a license amendment to the NRC in CY 2017 to authorize the irradiation of TPBARs in Watts Bar Unit 2. Subject to approval of the license amendment, tritium production in Watts Bar Unit 2 is projected to start in the fall of 2020. The DOE's decision also allows for irradiation of TPBARs at the Sequoyah site in the future; however, TVA does not have plans to employ Sequoyah units for tritium production in the near term.

**Extended Power Uprate.** TVA is undertaking an EPU project at Browns Ferry that is expected to increase the amount of electrical generation capacity of its reactors. The license for each reactor was amended to allow reactor operation at the higher power level. The Browns Ferry EPU license amendments were approved by the NRC on August 14, 2017, following a nearly two-year review.

TVA plans to begin implementing the EPU project during the plant refueling outages in the spring of 2018 for Unit 3, the fall of 2018 for Unit 1, and the spring of 2019 for Unit 2. Full EPU power is expected to be achieved following the noted outages for each unit. The project has involved and continues to involve extensive engineering analyses, and modification and replacement of certain existing plant components to enable the units to produce the additional power requested by the license amendments. The project is estimated to cost approximately \$475 million and add approximately 465 MW of generating capacity. See Note 21 — Legal Proceedings — Administrative Proceeding

Regarding Browns Ferry Nuclear Plant Extended Power Uprate.

Performance of Suppliers. On March 29, 2017, Westinghouse, a subsidiary of Toshiba Corporation ("Toshiba"), filed for protection under Chapter 11 of the United States Bankruptcy Code. TVA currently has several contracts with Westinghouse and Toshiba, including contracts for the enrichment and fabrication of nuclear fuel and the manufacture of a steam generator, as well as several ongoing agreements for maintenance and outage support at its nuclear and coal-fired plants. TVA is assessing potential performance impacts, including procurement of parts and services as well as outage schedules. Westinghouse and Toshiba are currently performing under the TVA contracts; however, if either supplier is unable to perform under TVA's existing contracts and TVA is unable to obtain similar services or required intellectual property at similar terms from other vendors, TVA could experience delays, disruptions, additional costs, or other operational outcomes which TVA cannot predict at this time, but which could be material.

Clean Air Projects. During 2011, the TVA Board approved the addition of emission control equipment at Gallatin. TVA completed the addition of scrubbers on the four Gallatin units during 2016 and is currently installing selective catalytic reduction ("SCR") systems on these units. The first two SCRs were placed in service in June 2017 and July 2017. It is currently anticipated that the remaining two SCRs will be operational in the fall of 2017. In addition, at its December 30, 2014 meeting, the TVA Board authorized the installation of SCRs and scrubbers on Units 1 and 4 at Shawnee. It is anticipated that these systems will be operational during the first quarter of 2018.



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Coal Combustion Residual Facilities. TVA has committed to a programmatic approach to the elimination of wet storage of CCRs within the TVA service area. Under this program (the “CCR Conversion Program”), TVA has committed to (1) convert all operational coal-fired plants to dry CCR storage, (2) close all wet storage facilities, and (3) meet all applicable state and federal regulations. To carry out its CCR Conversion Program, TVA is undertaking the following actions:

Dry generation and dewatering projects. Conversion of coal plant CCR wet processes to dry generation or dewatering is complete at Bull Run, and construction is underway at Kingston and Shawnee. Construction is scheduled to begin at Gallatin in 2018 and at Paradise in 2019.

Landfills. Lined and permitted dry storage facilities have been constructed and are operational at Bull Run, Kingston, and Gallatin. Construction of new lined and permitted dry storage facilities are scheduled to begin at Cumberland, Paradise, and Shawnee in 2018 and at Bull Run in 2019.

Wet CCR impoundment closures. TVA is planning to close wet CCR impoundments in accordance with federal and state requirements when (1) coal-fired plants are converted to dry CCR processes and dry storage landfills become operational or (2) plant operations cease. Closure project schedules and costs are driven by the selected closure technology (such as cap and close in place or closure by removal). TVA issued an environmental impact statement ("EIS") in June 2016 that addresses the closure of CCR impoundments at TVA's coal-fired plants. TVA issued its associated Record of Decision in July 2016. Although the EIS was designed to be programmatic in order to address the mode of impoundment closures, it specifically addressed closure methods at 10 impoundments. TVA subsequently decided to close those impoundments, although final closure plans are still subject to approval by appropriate state regulators. Additional National Environmental Policy Act analyses will be conducted as other impoundments are designated for closure. As environmental studies are performed and closure methodologies are determined, detailed project schedules and estimates will be finalized.

Groundwater monitoring. Compliance with the Environmental Protection Agency's ("EPA") CCR rule as well as other requirements will require additional engineering and analysis as well as implementation of a comprehensive groundwater monitoring program. As further analyses are performed, including evaluation of monitoring results, there is the potential for additional costs for investigation and/or remediation. TVA expects to continue to evaluate and update these cost estimates.

The CCR Conversion Program is scheduled to be completed by 2022 with two exceptions. First, a new landfill at Shawnee will be required to accommodate the addition of air pollution controls, and the landfill is scheduled to be operational by 2020. Once the new landfill is in service, the existing bottom ash impoundment and dry stack will be closed in accordance with federal and state requirements. Second, the impoundments at Gallatin are pending additional studies to determine the final closure methodology and schedule. While plans are currently being formulated for the CCR closure methodology for Gallatin, TVA is involved in two lawsuits relating to alleged releases of waste materials from the CCR facilities at Gallatin. On August 4, 2017, the court in one case ordered TVA to move all materials from the existing impoundments to a lined facility but did not impose any monetary penalties. The costs of constructing a lined facility onsite and excavating and moving the ash is approximately \$900 million. If TVA is required to use a facility offsite, then the costs could be approximately \$2.0 billion, plus an amount of additional costs reflecting the expected impacts of inflation given the extended duration of an offsite relocation project. These amounts do not include costs or penalties associated with any order in the other case. These amounts cannot be estimated at this time, but could be material. See Note 8.

Through September 30, 2017, TVA had spent approximately \$1.2 billion on its CCR Conversion Program. TVA expects to spend approximately an additional \$1.1 billion on the CCR Conversion Program through 2022, excluding new requirements related to the Gallatin lawsuits. Once the CCR Conversion Program is completed, TVA will

continue to undertake certain CCR projects, including building new landfill sections under existing permits and closing existing sections once they reach capacity. See Item 1, Business — Environmental Matters — Cleanup of Solid and Hazardous Wastes — Coal Combustion Residuals.

**Natural Gas-Fired Units.** During 2014, the TVA Board approved the construction of two natural gas-fired generation facilities — Paradise Combined Cycle Plant and Allen Combined Cycle Plant. The Paradise Combined Cycle Plant, with a cost of approximately \$900 million and a generation capacity of approximately 1,100 megawatts ("MW"), began commercial operations on April 7, 2017. Paradise Units 1 and 2, which are coal-fired with a combined summer dependable capability of 1,230 MW, were retired on April 15, 2017. These units were previously idled in February 2017 and December 2016, respectively, in anticipation of the natural gas-fired facility coming online. TVA is continuing to operate coal-fired Paradise Unit 3 on the Paradise site.

Allen Combined Cycle Plant has an expected generation capacity of approximately 1,100 MW with a cost not to exceed \$975 million. Pre-commercial operations on Units 1 and 2 began in September 2017, and the plant is expected to be operational in 2018. Upon completion of this facility, the existing coal-fired units at the site will be retired. See Regulatory Compliance — Allen Groundwater Issues — Groundwater Investigations below.

**Renewable Energy Resources.** On November 10, 2016, the River Bend Solar Energy Center located in northern Alabama began commercial operation. TVA has a 20-year power purchase agreement signed on February 23, 2015, with NextEra Energy Resources for power generated from the facility. The River Bend Solar Energy Center has more than 300,000 solar panels with trackers that are designed to follow the sun from east to west each day to maximize energy production with a

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generating capacity of 75 MW. The power purchase agreement supports TVA's renewable energy portfolio and is helping TVA meet its commitment to provide low-cost, carbon-free electricity.

River Management. The summer of 2016 was the hottest and driest in the Tennessee Valley since 2010 — a trend that continued into the first six months of 2017. During the third and fourth quarter of 2017, the Tennessee Valley region saw a return to more normal rainfall. However, because of lingering dry conditions during 2016 and the first half of 2017, runoff continues to lag behind normal. Increased rainfall during the third and fourth quarter has helped TVA meet its river system commitments, including maintaining minimum river flows for navigation; generating electricity; maintaining water quality, water supply, and recreation for the Tennessee Valley; having cool water available to meet thermal compliance and enabling normal operation of TVA's nuclear and fossil-fueled plants; generating low-cost hydroelectric power; and oxygenating water to help fish species remain healthy. Despite the increased rainfall during the third and fourth quarters of 2017, rainfall and runoff for 2017 were six percent and 15 percent below normal, respectively, which resulted in conventional hydroelectric generation being 18 percent below normal and 11 percent lower during 2017 as compared to 2016.

Small Modular Reactors. TVA submitted an Early Site Permit Application ("ESPA") for review by the NRC in May 2016. The NRC completed its acceptance review of the application on December 30, 2016, and began its detailed technical review of the application in January 2017. The ESPA is based on the potential future construction and operation of two or more small modular reactors ("SMR") units at TVA's Clinch River site in Oak Ridge, Tennessee. TVA's ESPA is based upon information regarding the various SMR designs under development in the United States. Because a design has not been selected, the ESPA seeks approval of a Plant Parameter Envelope that encompasses any of the designs. TVA and the DOE are working under an interagency agreement to jointly fund licensing activities for the Clinch River site with DOE reimbursement of up to 50 percent of TVA's eligible costs through 2020.

TVA is developing the Clinch River site on a schedule that supports submittal of a combined construction and operating license ("COL") application in 2020, in conjunction with supporting the NRC's review of the ESPA. Submittal of a COL is subject to sufficient progress being made by the SMR vendor(s) with their design certification(s) and a TVA decision to select a specific SMR technology and proceed with development of a COL application in 2018. The project has a great deal of flexibility at this early stage and by moving forward with an ESPA, TVA will be in a position to build a SMR if and when additional power sources are needed. Any decision to construct a SMR would require approval by the TVA Board.

Three environmental groups filed petitions to intervene in the ESPA proceeding. On October 10, 2017, the Atomic Safety and Licensing Board issued a decision admitting two contentions proffered jointly by Southern Alliance for Clean Energy ("SACE") and Tennessee Environmental Council ("TEC") and dismissing a third. The decision also denied admission of one proffered contention by Blue Ridge Environmental Defense League ("BREDL"). See Note 21 — Legal Proceedings — Petitions to Intervene in the Proceeding Involving the Early Site Permit Application for Small Modular Reactors at TVA's Clinch River Site.

## Dam Safety and Remediation Initiatives

Assurance Initiatives. TVA has an established dam safety program, which includes procedures based on the Federal Guidelines for Dam Safety, with the objective of reducing the risk of a dam safety event. The program is comprised of various engineering activities for all of TVA's dams including safety reassessments using modern industry criteria and the new probable maximum flood and site-specific seismic load cases.

One aspect of the guidelines is that dam structures will be periodically assessed to assure that TVA's dams meet current design criteria. These assessments include material sampling of the dam and foundational structures and detailed engineering analysis. TVA has completed 49 assessments between 2013 and 2017. Results of the completed

assessments identified areas for further studies at several TVA dams, including Boone and Pickwick (as discussed in more detail below). Going forward, TVA will continue its preventative and ongoing maintenance as a part of this safety program. TVA has spent \$82 million on dam safety assurance initiatives since 2012 and expects to spend an additional \$210 million through 2021.

**Boone Dam Remediation.** In October 2014, a sinkhole was discovered near the base of the earthen embankment at Boone Dam, and a small amount of water and sediment was found seeping from the river bank below the dam. TVA identified underground pathways contributing to the seepage and prepared a plan to repair the dam, which consists of the construction of a composite seepage barrier in the dam's earthen embankment. TVA completed the first part (low mobility grouting) of its test grouting program on the embankment in September 2016 and is currently evaluating the effectiveness of that grouting phase. The second phase of the grouting program (high mobility grouting) is on hold as TVA continues to perform investigative drilling, testing, and other activities in support of the seepage barrier design. Based on preliminary findings, results are being incorporated into the design, and some planned activities are being re-sequenced.

As determined from the extensive analyses, TVA has decided that the overall remediation plan for Boone Dam remains the installation of a composite seepage barrier wall. As design and construction plans are finalized, the estimated cost and duration continue to be refined. At its August 23, 2017 meeting, the TVA Board approved funding of the plan based on current cost estimates, which are approximately \$450 million with completion of the remediation targeted in 2022. TVA is continuing to work with the community to help mitigate local impacts of the extended drawdown.

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Pickwick South Embankment Remediation. Reassessments of Pickwick found low safety factors for post-earthquake stability indicating that the dam is at significant risk for slope stability failure following a seismic event in portions of the south embankment. Slope stability failure could lead to a breach of the south embankment and loss of the reservoir, resulting in loss of life and damage to property downstream, disruption to navigation, and loss of generation and recreation.

On September 30, 2016, TVA issued a final environmental assessment and finding of no significant impact for its proposed upgrades to the south embankment. Upon completion of the preliminary engineering study, TVA determined that remediation of the south embankment should be performed by constructing berms on the upstream and downstream slopes. The design phase of the project began during the first quarter of 2017, and the project is expected to be in full construction during 2018. The project is currently estimated to be completed in two years. However, the project may take longer than two years depending on successful construction sequencing. The total project cost is estimated to be approximately \$100 million.

## Surplus Property

TVA continues to study its real estate portfolio for the purpose of aligning its real estate holdings with TVA's strategic direction. A comprehensive assessment of its real estate holdings has been completed, and TVA is implementing a strategy aimed at reducing cost and right-sizing its portfolio as part of the effort.

Bellefonte Nuclear Plant. On November 14, 2016, following a public auction, TVA entered into a contract to sell substantially all of its Bellefonte site to Nuclear Development, LLC for \$111 million. Nuclear Development, LLC paid TVA \$22 million on November 14, 2016, and the remaining \$89 million is due at closing. Nuclear Development, LLC has up to two years from November 14, 2016, to close on the property, and TVA will maintain the site until then. The closing is subject to, among other conditions, a determination by TVA's Chief Executive Officer that potential environmental impacts have been appropriately addressed or are acceptable. TVA's CEO made this determination in the affirmative on August 10, 2017. See Note 7 — Deferred Nuclear Generation Units.

Muscle Shoals Property. In alignment with its strategic direction of right-sizing its real estate portfolio, TVA has drafted a strategy to further reduce a significant number of buildings and property in Muscle Shoals, Alabama, including the disposition of 900 acres of the 970 acres approved by the TVA Board in 2012. Active marketing efforts began in March 2017, and TVA is receiving interest from local groups with the ability to promote local economic growth in the area. Depending on interest, TVA plans to auction the 900 acres.

Knoxville Property. In 2016, TVA completed a comprehensive assessment of its real estate holdings in the Knoxville, Tennessee region including the Knoxville Office Complex ("KOC") and adjacent Summer Place Complex ("SPC"). As a result of this study and subsequent environmental assessment in 2017, TVA is planning to consolidate most of its Knoxville area employees into one location in the West Tower of the KOC and plans to convey the SPC and the East Tower of the KOC. Evaluation of the real estate portfolio is continuing.

## Regulatory Compliance

Transmission Issues. TVA anticipates expenditures related to transmission facilities to increase as a result of both new and evolving regulatory requirements. The North American Electric Reliability Corporation ("NERC") approved revisions to the Transmission Planning ("TPL") Reliability Standards in 2013. TVA has spent \$37 million since the approval of the standard through September 30, 2017, on existing transmission facilities and anticipates spending an additional \$15 million through 2018 to ensure compliance with the 2013 revision of the TPL standards. Total costs of compliance with the standard, including those beyond 2018, are estimated to be approximately \$650 million.

Steam-Electric Effluent Guidelines. On November 3, 2015, the EPA published a final rule revising the existing steam electric effluent limitation guidelines ("ELGs"). The ELGs update the existing technology-based water discharge limitations for power plants. Compliance with new requirements is required in the 2018-2023 timeframe and will necessitate major upgrades to wastewater treatment systems at all coal-fired plants. Dry fly ash handling is mandated by the rule. The rule also requires either dry bottom ash handling systems or "no discharge" recycle of bottom ash transport waters, and new technology-based limits on flue gas desulfurization (scrubber) wastewater require primary physical/chemical treatment and secondary biological treatment to meet extremely low limits for arsenic, mercury, and selenium.

The EPA published a rule on September 18, 2017, postponing certain compliance/applicability dates to provide the EPA time to review and revise, as necessary, the new and stringent ELGs previously established for flue gas desulfurization wastewater and bottom ash transport water. The EPA pushed back the compliance dates for these two wastestreams from the 2018-2023 timeframe to 2020-2023. Other requirements and applicability dates of the rule for fly ash transport water, flue gas mercury control wastewater, and gasification wastewater remain in effect. See Item 1, Environmental Matters — Water Quality Control Developments — Steam-Electric Effluent Guidelines.

TVA currently has four plants with wet scrubbers that will have to comply with the scrubber-related limits, the largest being Cumberland. TVA is working to address future compliance with the ELGs at Cumberland given its unique "once-through" scrubber design. Compliance with the current rule at Cumberland without modification to address the unique design could cause

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TVA to incur disproportionately high costs at Cumberland or experience other operational outcomes which TVA cannot predict at this time.

Allen Groundwater Issues. TVA is currently addressing two issues related to groundwater at its Allen Fossil Plant and Allen Combined Cycle Plant sites. Each is described below.

Challenges to Issuance to TVA of Well Permits. TVA initially intended to use wastewater for the Allen Combined Cycle Plant's cooling system but determined such a method would be cost prohibitive and less reliable from both a capital and long-term operations and maintenance perspective. Due to the industrial nature of the wastewater, it would have required significantly more water treatment than initially anticipated. TVA evaluated several wastewater treatment alternatives (and other water supply options) and concluded the current plan to install five wells to obtain cooling water from an aquifer is the preferred method. Three of the five wells were permitted in the summer of 2016 and were installed by September 2016. The remaining two wells were permitted in September 2016. An administrative appeal to the issuance of the final two well permits was denied by the Groundwater Quality Control Board of Shelby County ("Groundwater Board") in November 2016. On February 1, 2017, the Sierra Club and a local non-profit organization, Protect Our Aquifer, filed a petition with the Shelby County chancery court seeking judicial review of the Groundwater Board's decision. TVA removed that action to the U.S. District Court for the Western District of Tennessee and filed a motion to dismiss the petition. On August 18, 2017, the federal court granted TVA's motion and dismissed the case.

Groundwater Investigations. In May 2017, TVA reported elevated levels of arsenic, lead, and fluoride in water samples taken at a few shallow-aquifer groundwater monitoring wells at Allen Fossil Plant. TVA is working with the Tennessee Department of Environment and Conservation ("TDEC") to identify the source of the arsenic, lead, and fluoride and received a Remedial Site Investigation request from TDEC in July 2017, outlining the objectives of the investigation and asked TVA to provide a work plan. TVA submitted an initial version of the work plan in August 2017, and a revised work plan in September 2017 responding to TDEC comments. The plan includes more extensive groundwater sampling to identify the source and extent of the contamination. The plan also includes groundwater modeling to determine current groundwater flow conditions and likely future conditions that may develop as a result of pumping cooling water from the deeper aquifer to the Allen Combined Cycle Plant, including a pump test involving the cooling water withdrawal wells; TVA has contracted with the U.S. Geological Survey and the University of Memphis to conduct this portion of the work. A Remedial Investigation Report summarizing the results of the investigation will be submitted to TDEC in February 2018. Depending of the results of the monitoring and the determination of the source of the contamination, TVA may be required to take actions including remediation and/or altering its planned source of cooling water for the Allen Combined Cycle Plant.

Cybersecurity. On May 11, 2017, President Donald Trump signed EO 13800, "Strengthening the Cybersecurity of Federal Networks and Critical Infrastructure", that requires that all federal agencies adopt the Framework for Improving Critical Infrastructure Cybersecurity, developed by the National Institute of Standards and Technology ("NIST"). The executive order calls for many federal agencies to submit a risk management report in which agencies would describe their security measures and what are deemed to be significant risks. TVA submitted its risk management report to the Office of Management and Budget in July 2017 and received its cybersecurity assessment results in August 2017. TVA's cybersecurity program was given an "effective" rating and is in alignment with NIST standards.

## Pension Fund

As of September 30, 2017, TVA's qualified pension plan had assets of \$8.0 billion compared with liabilities of \$12.6 billion. The potential for the plan's funded status to improve in the near term is limited because of expected equity performance, the significant amount of benefits paid each year to plan beneficiaries, and historically low

discount rates to measure the plan's benefit obligation. The plan currently has approximately 33,000 participants, of which approximately 24,000 are retirees and beneficiaries currently receiving benefits. Benefits of over \$700 million are expected to be paid in 2018. Per amendments to the plan in 2016, TVA made a contribution of \$300 million to the plan in 2017. In addition, at its August 23, 2017 meeting, the TVA Board approved an additional contribution of \$500 million to the plan in 2017 to help improve the plan's funded status. See Note 20.

#### Ratemaking

At its August 23, 2017 meeting, the TVA Board approved a base rate adjustment which became effective on October 1, 2017. The base rate adjustment is expected to contribute approximately \$195 million to 2018 revenues. See Distributed Energy Resources and Item 1, Business — Rates — Rate Methodology.



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### Safeguarding Assets

**Physical Security — Non-Nuclear Asset Protection.** TVA utilizes a variety of security technologies, security awareness activities, and security personnel to prevent sabotage, vandalism, and thefts. Any of these activities could negatively impact the ability of TVA to generate, transport, and deliver power to its customers. TVA's Police and Emergency Management personnel are active participants with numerous professional and peer physical security organizations in both the electric industry and law enforcement communities.

Physical attacks on transmission facilities across the country have heightened awareness of the need to physically protect facilities. TVA is working with the NERC, the SERC Reliability Corporation, the North American Transmission Forum, and other utilities to implement industry approved recommendations and standards.

**Nuclear Security.** Nuclear security is carried out in accordance with federal regulations as set forth by the NRC. These regulations are designed for the protection of TVA's nuclear power plants, the public, and employees from the threat of radiological sabotage and other nuclear-related terrorist threats. TVA has security forces to guard against such threats.

**Cybersecurity.** TVA operates in a highly regulated environment. TVA's cybersecurity program aligns or complies with the Federal Information Security Management Act, the NERC Critical Infrastructure Protection requirements, and the NRC requirements for cybersecurity, as well as industry best practices. As part of the U.S. government, TVA coordinates with and works closely with the Department of Homeland Security and the United States Computer Emergency Readiness Team ("US-CERT"). US-CERT functions as a liaison between the Department of Homeland Security and the public and private sectors to coordinate responses to security threats from the internet. TVA is also participating in studies funded through the DOE to identify, design, and test new solutions for protecting critical infrastructure from cyber attacks. See Key Initiatives and Challenges — Regulatory Compliance — Cybersecurity.

In recent months, TVA has seen an increase in ransomware-related activity, with much of it directed to electric utilities by means of malicious and targeted emails. Such activity has resulted in a heightened state of awareness and preparedness across the industry. Although TVA has not been compromised during these recent incidents, it is leveraging its federal intelligence partners to better predict, detect, and respond to these potential attacks.

The risk of these cybersecurity events continues to intensify, and while TVA has been, and will likely continue to be, subjected to such attacks, to date the attacks have not impacted TVA's ability to operate as planned or compromised data which could involve TVA in legal proceedings. See Item 1A, Risk Factors — Operational Risks — TVA's facilities and information infrastructure may not operate as planned due to cyber threats to TVA's assets and operations.

**Transmission Assets.** In addition to physical and cybersecurity attacks, TVA's transmission assets are vulnerable to various types of electrically charged energy disruptions such as those from geomagnetic disturbances ("GMD") and electromagnetic pulses ("EMP"). Although the effects of GMD and EMP are dissimilar, they are often considered together. On September 22, 2016, Federal Energy Regulatory Commission ("FERC") approved the Phase 2 NERC Standard TPL-007 to address GMD events. TVA has already met many of the requirements of the new standard with completion of a model of the 500 kV grid and evaluation of the effects of solar storms ranging from NERC's reference case to possible extreme levels. Only a few items of equipment would exceed threshold levels even for the extreme cases and no damage would be expected. FERC's approval of NERC Standard TPL-007 included requirements for changes to this standard by May 2018. TVA is an active participant with NERC in developing these changes. The most serious threats from EMP are those caused by high-altitude nuclear explosions. Like others in the industry, TVA is coordinating with federal and state authorities, NERC, Electric Power Research Institute ("EPRI"), and other grid owners and operators to address this re-emergent concern.

Critical Accounting Policies and Estimates

TVA's consolidated financial statements are prepared in accordance with accounting principles generally accepted in the United States of America ("GAAP"), which require management to make estimates, judgments, and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. Each of these estimates varies in regard to the level of judgment involved and its potential impact on TVA's financial results. Estimates are deemed critical either when a different estimate could have reasonably been used, or where changes in the estimate are reasonably likely to occur from period to period, and such use or change also would materially impact TVA's financial condition, results of operations, or cash flows. TVA's critical accounting policies are also discussed in Note 1 of the Notes to Consolidated Financial Statements in this Annual Report.

TVA believes that its most critical accounting policies and estimates relate to the following:

Regulatory Accounting;  
Gallatin Coal Combustion Residuals;  
Asset Retirement Obligations; and  
Pension and Other Post-Retirement Benefits.

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Management has discussed the development, selection, and disclosure of critical accounting policies and estimates with the Audit, Risk, and Regulation Committee of the TVA Board. While TVA's estimates and assumptions are based on its knowledge of current events and actions it may undertake in the future, actual results may ultimately differ from these estimates and assumptions.

### Regulatory Accounting

The TVA Board is authorized by the TVA Act to set rates for power sold to customers; thus, TVA is "self-regulated." Additionally, TVA's regulated rates are designed to recover its costs of providing electricity. In view of demand for electricity and the level of competition, TVA has assumed that rates, set at levels that will recover TVA's costs, can be charged and collected. As a result of these factors, TVA records certain assets and liabilities that result from the regulated ratemaking process that would not be recorded under GAAP for non-regulated entities. Regulatory assets generally represent incurred costs that have been deferred because such costs are probable of future recovery in customer rates. Regulatory liabilities generally represent obligations to make refunds to customers for previous collections of costs that are not likely to be incurred or deferral of gains that will be credited to customers in future periods. The timeframe over which the regulatory assets are recovered from customers or regulatory liabilities are credited to customers is subject to annual TVA Board approval. At September 30, 2017, TVA had \$9.1 billion of Regulatory assets and \$188 million of Regulatory liabilities.

TVA assesses whether the regulatory assets are probable of future recovery by considering factors such as applicable regulatory changes, potential legislation, and changes in technology. Based on these assessments, TVA believes the existing regulatory assets are probable of recovery. This determination reflects the current regulatory and political environment and is subject to change in the future.

TVA made two changes in the accounting policy used to record regulatory assets and liabilities during 2017. TVA recorded the liability related to the Gallatin Coal Combustion Residual Facilities as a regulatory asset to be collected as amounts are collected in rates or paid out, starting October 1, 2018. The TVA Board also authorized management to accelerate amortization of certain regulatory assets to the extent actual net income in 2018 exceeds the budgeted amount, up to the aggregated amount of those certain regulatory assets. TVA does not believe there is a reasonable likelihood that there will be a material change in the estimates or assumptions used to record regulatory assets and liabilities. If future recovery of regulatory assets ceases to be probable, or any of the other factors described herein cease to be applicable, TVA would be required to write off these costs and recognize them in net income or other comprehensive income.

### Gallatin Coal Combustion Residuals

TVA may incur significant environmental clean-up costs related to its CCR facilities at Gallatin. See Note 8. These costs are based upon estimates of the incremental direct costs of the remediation effort, including costs of compensation and benefits for those employees who are expected to devote a significant amount of time directly to the remediation effort. Such amounts are included in the estimate when it is probable that a liability has been incurred as of the financial statement date and the amount of loss can be reasonably estimated. When both of those recognition criteria are met and the estimated loss is a range, TVA accrues the amount that appears to be a better estimate than any other estimate within the range, or accrues the minimum amount in the range if no amount within the range is a better estimate than any other amount. If the actual costs materially differ from the estimate, TVA's results of operations, financial condition, and cash flows could be affected materially.

At September 30, 2017, the costs include, among other things, environmental studies concerning the existing and new facilities, the licensing activities for the new facility, design and construction of the new facility, relocating the material from the existing facilities to the new facility, closing the existing facilities, monitoring activities, and the

expected impacts of inflation given the anticipated duration of the project. At September 30, 2017, TVA has estimated these costs to be approximately \$900 million. The TVA Board approved regulatory accounting treatment for certain costs associated with compliance with orders or settlements related to lawsuits involving CCR facilities. See Note 8 — Financial Impact.

The following categories could have a significant effect on estimates related to environmental clean-up costs of Gallatin coal combustion residuals:

**Final Removal Method** - It is reasonably possible that TVA will not be able to obtain the necessary permits to build the facility on the Gallatin site and will be required to move the CCR materials offsite. Offsite relocation for this or any other reason would materially increase TVA's project cost estimate. If TVA is required to use a facility offsite, then the costs could be approximately \$2.0 billion, plus an amount of additional costs reflecting the expected impacts of inflation given the extended duration of an offsite relocation project.

**Uncertainty Inherent in Project Cost Estimates** - The ultimate cost of the removal project will depend on actual timing and results of ongoing litigation, environmental studies, licensing, site subsurface conditions, contractor availability, weather, equipment, available material resources, and other contingency factors. These contingency factors could cause the project cost estimate to change materially in the near term. TVA updates its estimate for project costs as changes in these factors are determined to be probable of occurring.

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Excluded Costs - The costs do not include such items as any additional order or penalty arising from the TDEC lawsuit, which cannot be reasonably estimated at this time. In the event that these costs become probable and reasonably estimable, they could materially increase TVA's project cost estimate.

### Asset Retirement Obligations

TVA recognizes legal obligations associated with the future retirement of certain tangible long-lived assets. These obligations relate to TVA's generating facilities, including coal-fired, nuclear, hydroelectric, and natural gas and/or oil-fired. They also pertain to coal ash impoundments, transmission facilities, and other property-related assets. Activities involved with the retirement of these assets could include decontamination and demolition of structures, removal and disposal of wastes, and site restoration. TVA periodically reviews its estimated asset retirement obligation ("ARO") liabilities. Revisions to the ARO estimates are made whenever factors indicate that the timing or amounts of estimated cash flows have changed. Any change to an ARO liability is recognized prospectively as an equivalent increase or decrease in the carrying value of the capitalized asset. Any accretion or depreciation expense related to these liabilities and assets is charged to a regulatory asset. See Note 7 — Nuclear Decommissioning Costs and Non-Nuclear Decommissioning Costs and Note 12.

Nuclear Decommissioning. Utilities that own and operate nuclear plants are required to recognize a liability for legal obligations related to nuclear decommissioning. An equivalent amount is recorded as an increase in the carrying value of the capitalized asset and allocated to a regulatory asset over the useful life of the capitalized asset. The initial obligation is measured at its estimated fair value using various judgments and assumptions. Fair value is developed using an expected present value technique that is based on assumptions of market participants and that considers estimated retirement costs in current period dollars that are inflated to the anticipated decommissioning date and then discounted back to the date the ARO was incurred. Decommissioning cost studies are updated for each of TVA's nuclear units at least every five years. Changes in assumptions and estimates included within the calculations of the fair value of AROs could result in significantly different results than those identified and recorded in the financial statements.

At September 30, 2017, the estimated future nuclear decommissioning cost recognized in the financial statements was \$2.9 billion and was included in AROs, and the unamortized regulatory asset related to nuclear decommissioning ARO costs of \$823 million was included in Regulatory assets.

The following key assumptions can have a significant effect on estimates related to the nuclear decommissioning costs reported in TVA's nuclear ARO liability:

Timing and Method – In projecting decommissioning costs, two assumptions must be made to estimate the timing of plant decommissioning. First, the date of the plant's retirement must be estimated. At Browns Ferry and Sequoyah, the estimated retirement date is based on the unit with the longest license period remaining. At Watts Bar, the estimated retirement date is based on each unit's license period. Second, an assumption must be made on the timing of the decommissioning. TVA has ascribed probabilities to two different decommissioning methods related to its nuclear decommissioning obligation estimate: the DECON method and the SAFSTOR method. The DECON method requires that radioactive contamination be removed from a site and safely disposed of or decontaminated to a level that permits the site to be released for unrestricted use shortly after it ceases operation. The SAFSTOR method allows nuclear facilities to be placed and maintained in a condition that allows the facilities to be safely stored and subsequently decontaminated to levels that permit release for unrestricted use. TVA bases its nuclear decommissioning estimates on site-specific cost studies, which are updated for each of TVA's nuclear units at least every five years. TVA completed new cost studies in 2017. The most recent study was approved and implemented in September 2017. An increase of \$250 million was recorded to the nuclear AROs as a result of the updates. Changes in probabilities ascribed to the assumptions or the timing of decommissioning can significantly change the present value of TVA's obligations.

Cost Estimates – There is limited experience with actual decommissioning of large nuclear facilities. Changes in technology and experience as well as changes in regulations regarding nuclear decommissioning could cause cost estimates to change significantly. TVA's cost studies assume current technology and regulations.

Cost Escalation Rate – TVA uses expected inflation rates over the remaining timeframe until the costs are expected to be incurred to estimate the amount of future cash flows required to satisfy TVA's decommissioning obligations.

Discount Rate – TVA uses its incremental borrowing rate over a period consistent with the remaining timeframe until the costs are expected to be incurred to calculate the present value of the weighted estimated cash flows required to satisfy TVA's decommissioning obligations.

The actual decommissioning costs may vary from the derived estimates because of changes in current assumptions, such as the assumed dates of decommissioning, changes in regulatory requirements, changes in technology, and changes in the cost of labor, materials, and equipment. A 10 percent change in TVA's ARO for nuclear decommissioning cost at September 30, 2017, would have affected the liability by approximately \$286 million.

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Non-Nuclear Decommissioning. At September 30, 2017, the estimated future non-nuclear decommissioning cost recognized in the financial statements was \$1.4 billion and was included in AROs, and the unamortized regulatory asset related to non-nuclear decommissioning ARO costs of \$703 million was included in Regulatory assets. This decommissioning cost estimate involves estimating the amount and timing of future expenditures and making judgments concerning whether or not such costs are considered a legal obligation. Estimating the amount and timing of future expenditures includes, among other things, making projections of the timing and duration of the asset retirement process and predicting how costs will escalate with inflation.

The following key assumptions can have a significant effect on estimates related to the non-nuclear decommissioning costs:

**Timing and Method** – In projecting non-nuclear decommissioning costs, the date of the asset's retirement must be estimated. In instances where the retirement of a specific asset will precede the retirement of the generating plant, the anticipated retirement date of the specific asset is used. Additionally, TVA expects to incur certain ongoing costs subsequent to the initial asset retirement. TVA develops its cost estimates based on likelihood of decommissioning method where options exist in fulfilling legal obligations (e.g., cap and close in place or clean closure for coal ash impoundments). The decommissioning method is determined based on several factors including available technologies, environmental studies, cost factors, resource availability, and timing requirements. As these factors are considered and decommissioning methods are determined, the detailed project schedules and estimates are adjusted. During 2016, TVA management updated its non-nuclear plant closure method assumption from a maintain-in-place method to a plant demolition method.

**Technology and Regulation** – Changes in technology and experience as well as changes in regulations regarding non-nuclear decommissioning could cause cost estimates to change significantly. TVA's cost estimates generally assume current technology and regulations. In April 2015, the EPA published its final rule governing CCRs, which regulates landfill and impoundment location, design, and operations; dictates certain pond-closure conditions; and establishes groundwater monitoring and closure and post-closure standards. As a result of this ruling, in 2015 TVA made revisions to the assumptions and estimates used to calculate its CCR AROs. TVA continues to evaluate the impact of the rule on its operations, including cost and timing estimates of related projects. As a result, further adjustments to its ARO liabilities may be required as estimates are refined.

**Cost Escalation Rate** – TVA uses expected inflation rates over the remaining timeframe until the costs are expected to be incurred to estimate the amount of future cash flows required to satisfy TVA's decommissioning obligations.

**Discount Rate** – TVA uses its incremental borrowing rate over a period consistent with the remaining timeframe until the costs are expected to be incurred to calculate the present value of the weighted estimated cash flows required to satisfy TVA's decommissioning obligations.

The actual decommissioning costs may vary from the derived estimates because of changes in current assumptions, such as the assumed dates of decommissioning, changes in the discount or escalation rates, changes in regulatory requirements, changes in technology, and changes in the cost of labor, materials, and equipment. A 10 percent change in TVA's ARO for non-nuclear decommissioning costs at September 30, 2017, would have affected the liability by approximately \$145 million.

## Pension and Other Post-Retirement Benefits

TVA sponsors a defined benefit pension plan that is qualified under section 401(a) of the Internal Revenue Code and covers substantially all of its full-time annual employees hired prior to July 1, 2014. TVARS, a separate legal entity governed by its own board of directors, administers the qualified defined benefit pension plan. TVA also provides a

Supplemental Executive Retirement Plan (“SERP”) to certain executives in critical positions, which provides supplemental pension benefits tied to compensation levels that exceed limits imposed by IRS rules applicable to the qualified defined benefit pension plan. Additionally, TVA provides post-retirement health care benefits for most of its full-time employees who reach retirement age while still working for TVA.

TVA's pension and other post-retirement benefits contain uncertainties because they require management to make certain assumptions related to TVA's cost to provide these benefits. Numerous factors are considered including the provisions of the plans, changing employee demographics, various actuarial calculations, assumptions, and accounting mechanisms. The most significant of these factors are discussed below.

**Expected Return on Plan Assets.** The qualified defined benefit pension plan is the only plan that is funded with qualified plan assets. In determining the expected long-term rate of return on pension plan assets, TVA uses a process that incorporates actual historical asset class returns and an assessment of expected future performance and takes into consideration external actuarial advice, the current outlook on capital markets, the asset allocation policy, and the anticipated impact of active management.

During 2017, the TVARS Board decreased the expected long-term return on plan assets, net of investment management fees, from 7.00 percent to 6.75 percent. Upon review of the changes in the plan's asset target allocation mix,



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capital market outlooks, and the most recent studies, TVA management adopted the 6.75 percent expected long-term return on plan assets, which will be used to calculate the 2018 net periodic pension cost.

TVA recognizes the impact of asset performance on pension expense over a three-year phase-in period through a "market-related" value of assets calculation. Since the "market-related" value of assets recognizes investment gains and losses over a three-year period, the future value of assets used to calculate the expected rate of return on assets will be impacted as previously deferred gains or losses are recognized.

For the 2017 net periodic benefit cost, TVA used an expected rate of return of 7.00 percent. The plan's actual rate of return for 2017 was 10.92 percent. The difference between the expected and actual return on plan assets resulted in an actuarial gain of \$302 million that is recognized as a decrease in the related regulatory asset and the pension benefit obligation. A higher expected rate of return assumption decreases the net periodic pension benefit costs, whereas a lower expected rate of return assumption increases the net periodic pension benefit cost.

**Discount Rate.** TVA's discount rates are derived by identifying a theoretical settlement portfolio of high quality corporate bonds of Aa quality or higher sufficient to provide for the projected benefit payments. The model matches the present value of the projected benefit payments to the market value of the theoretical settlement bond portfolio with any resulting excess funds presumed to be reinvested and used to meet successive year benefit payments. A single equivalent discount rate is determined to align the present value of the required cash flow with the value of the bond portfolio. The resulting discount rates are reflective of both the current interest rate and the distinct liability of the pension and post-retirement plans.

The discount rate is somewhat volatile because it is determined based upon the prevailing rate as of the measurement date. A higher discount rate decreases the plan obligations and correspondingly decreases the net periodic pension and net post-retirement benefit costs for those plans where actuarial losses are being amortized. Alternatively, a lower discount rate increases net periodic pension and net periodic post-retirement costs. The discount rates used to determine the pension and post-retirement benefit obligations were 3.85 percent and 3.95 percent, respectively at September 30, 2017.

**Health Care Cost Trends.** TVA reviews actual recent cost trends and projected future trends in establishing health care cost trend rates. In 2017, TVA reset the current trend rate assumption used to determine the pre-Medicare eligible postretirement obligation to 6.50 percent with the assumption to gradually decrease each successive year until it reaches a 5.00 percent annual increase in health care costs in 2024 and beyond. This reset of the trend rate assumption resulted in a \$5 million increase of the post-retirement obligation at September 30, 2017. The assumed health care trend rate used to determine the post-Medicare eligible post-retirement benefit obligation remained consistent with the prior assumption that the health care cost trend would remain at zero percent through 2020 at which point it would increase to 4.00 percent in 2021 and beyond.

**Cost of Living Adjustments.** Cost of living adjustments ("COLAs") are an increase in the benefits for eligible retirees to help maintain the purchasing power of benefits as consumer prices increase. This assumption is based on the long-term expected future rate of inflation based on the capital market outlooks and economic forecasts. See Note 20 for further discussion on the calculation of the COLA. TVA's 2016 COLA assumption was 1.25 percent for CY 2017 and 2.00 percent for CY 2018 and thereafter. TVA's actual CY 2017 COLA was 0.99 percent. TVA's 2017 COLA assumption remained at 2.00 percent for CY 2018 and thereafter to measure the pension benefit obligation. A higher COLA increases the pension benefit obligation whereas a lower assumption decreases the obligation. The COLA assumption used to determine the benefit obligations at September 30 are used to determine the net periodic benefit costs for the following fiscal year adjusted for the actual COLA determined for the following calendar year.

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Sensitivity to Changes in Key Assumptions. The following tables illustrate the estimated effects of changing certain of the critical actuarial assumptions discussed above, while holding all other assumptions constant and excluding any impact for unamortized actuarial gains and losses:

Sensitivity to Certain Changes in Pension Assumptions

At September 30, 2017

Actuarial Assumption	Current Assumption		Change in Assumption		Impact
Effect on 2017 pension expense:					
Discount rate	3.65	%	(0.25)	)%	17
Expected return on assets	7.00	%	(0.25)	)%	16
COLA	2.00	%	0.25	%	27
Effect on benefit obligation at September 30, 2017:					
Discount rate	3.85	%	(0.25)	)%	367
COLA	2.00	%	0.25	%	128

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## Sensitivity to Changes in Assumed Health Care Cost Trend Rates

At September 30, 2017

	1%	1%
	Increase	Decrease
Effect on total of service and interest cost components for the year	\$ 5	\$ (5 )
Effect on end-of-year accumulated post-retirement benefit obligation	70	(67 )

Mortality. TVA's mortality assumptions are based upon actuarial projections in combination with actuarial studies of the actual mortality experience of TVARS's pension and post-retirement benefit plan participants taking into consideration the Society of Actuaries ("SOA") mortality table and projection scales as of September 30, 2017. TVA continues to monitor the availability of updates to mortality tables, longevity improvement scales, and mortality reviews and experience studies to consider whether these updates should be reflected in the current year mortality assumption.

In 2017, based upon an updated review of mortality improvements, TVA adopted a modified version of the SOA MP-2016 improvement scale and maintained its adjusted version of the SOA RP-2014 mortality table to measure the pension and post-retirement benefit obligation at September 30, 2017. The SOA MP-2016 scale decreased life expectancies more than had been previously anticipated in the SOA MP-2015 and SOA MP-2014 scales. The change in TVA's improvement scale resulted in a decrease in the pension and post-retirement benefit obligations of \$117 million and \$6 million, respectively, as of September 30, 2017.

Contributions. The minimum pension contribution for 2017 was \$300 million and was paid in twelve monthly installments. In September 2017, TVA also made an additional \$500 million contribution to the pension plan. TVA made contributions of \$5 million to the SERP and \$30 million, net of rebates and subsidies received, to the unfunded other post-retirement benefit plans. TVA expects to contribute \$300 million to TVARS, \$4 million to the SERP, and \$33 million to the other post-retirement benefit plans in 2018.

Accounting Mechanisms. In accordance with current accounting guidance, TVA utilizes a number of accounting mechanisms that reduce the volatility of reported pension expense. Differences between actuarial assumptions and actual plan results are deferred and amortized into period expense only when the accumulated differences exceed 10 percent of the greater of the projected benefit obligation or the market-relative value of plan assets. If necessary, the excess is amortized over the average future expected working lifetime of participants expected to receive benefits, which is over 10 years, but will steadily decrease as the plan is closed to new entrants. Additionally, TVA recognizes pension costs as regulatory assets to the extent that the amount calculated under GAAP expenses differs from the amount TVA contributes to the pension plan. Furthermore, amortization of net prior service cost/(credit) resulting from a plan change is included as a component of period expense in the year first recognized and every year thereafter until it is fully amortized. The increase in the benefit obligation due to a plan change is amortized over the average remaining service period of participating employees expected to receive benefits under the plan, which is currently 10 years and will continue to decline since no new participants will be added to the plan. The pension and post-retirement benefit plans have prior service credits related to plan changes made in 2009, 2010, and 2016 with remaining amortization periods of three to ten years.

## Fair Value Measurements

## Investments

Investment Funds. Investments classified as trading consist of amounts held in the Nuclear Decommissioning Trust ("NDT"), Asset Retirement Trust ("ART"), SERP, and Deferred Compensation Plan ("DCP"). These assets are

generally measured at fair value based on quoted market prices or other observable market data such as interest rate indices. These investments are primarily U.S. and international equities, real estate investment trusts, fixed income investments, high-yield fixed income investments, U.S. Treasury Inflation-Protected Securities, commodities, currencies, derivative instruments, and other investments. TVA has classified all of these trading securities as either Level 1, Level 2, or Investments measured at net asset value. See Note 16 — Valuation Techniques for a discussion of valuation levels of the investments.

Plan Investments. TVA's qualified benefit pension plan is funded with qualified plan assets. These investments are primarily global public equities, private equities, fixed income securities, public real assets, and private real assets. See Note 20 — Fair Value Measurements for disclosure of fair value measurements for investments held by TVARS that support TVA's qualified defined benefit pension plan.

Pricing. Prices provided by third-parties for the assets in investment funds and plan investments are subjected to automated tolerance checks by the investment portfolio trustee to identify and avoid, where possible, the use of inaccurate prices. Any such prices identified as outside the tolerance thresholds are reported to the vendor that provided the price. If the prices are validated, the primary pricing source is used. If not, a secondary source price that has passed the applicable tolerance check is used (or queried with the vendor if it is out of tolerance), resulting in either the use of a secondary price, where validated, or the last reported default price, as in the case of a missing price. For monthly valued accounts, where secondary price sources are available, an automated inter-source tolerance report identifies prices with an inter-vendor pricing

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variance of over two percent at an asset class level. For daily valued accounts, each security is assigned, where possible, an indicative major market index, against which daily price movements are automatically compared. Tolerance thresholds are established by asset class. Prices found to be outside of the applicable tolerance threshold are reported and queried with vendors as described above.

For investment funds, TVA additionally performs its own analytical testing on the change in fair value measurements each period to ensure the valuations are reasonable based on changes in general market assumptions. TVA also performs pricing tests on various portfolios comprised of securities classified in Levels 1 and 2 on a quarterly basis to confirm accuracy of the values received from the investment portfolio trustee. For plan investments, TVARS reviews the trustee's Service Organization Controls report and the pricing policies of the trustee's largest pricing vendor.

## Derivatives

TVA has entered into various derivative transactions, including commodity option contracts, forward contracts, swaps, swaptions, futures, and options on futures, to manage various market risks. Other than certain derivative instruments included in investment funds, it is TVA's policy to enter into these derivative transactions solely for hedging purposes and not for speculative purposes.

**Currency and Interest Rate Derivatives.** TVA has three currency swaps and four "fixed for floating" interest rate swaps. The currency swaps protect against changes in cash flows caused by volatility in exchange rates related to outstanding Bonds denominated in British pounds sterling. The currency and interest rate swaps are classified as Level 2 valuations as the rate curves and interest rates affecting the fair value of the contracts are based on observable data. The application of credit valuation adjustments ("CVAs") did not materially affect the fair value of these assets and liabilities at September 30, 2017.

**Commodity Contracts.** TVA enters into commodity derivatives for coal and natural gas that require physical delivery of the contracted quantity of the commodity. The fair values of these derivative contracts are determined using internal models based on income approaches. TVA develops an overall coal forecast based on widely-used short-term and mid-range market data from an external pricing specialist in addition to long-term internal estimates. To value the volume option component of applicable coal contracts, TVA uses a Black-Scholes pricing model which includes inputs from the overall coal price forecast, contract-specific terms, and other market inputs. Based on the use of certain significant unobservable inputs, these valuations are classified as Level 3 valuations. Additionally, any settlement fees related to early termination of coal supply contracts are included at the contractual amount. The application of CVAs did not materially affect the fair value of these assets and liabilities at September 30, 2017.

**Commodity Derivatives under the Financial Trading Program.** TVA established a Financial Trading Program ("FTP") under which it could purchase and sell futures, swaps, options, and similar derivative instruments to hedge its exposure to changes in prices of natural gas, fuel oil, coal, and other commodities. Although certain natural gas futures and swaps under the FTP remain at September 30, 2017, future purchases under the program have been suspended. TVA plans to continue to manage fuel price volatility through other methods and to periodically reevaluate its suspended FTP program for future use of financial instruments. TVA is prohibited from taking speculative positions in its FTP.

Financial instruments under the FTP are valued based on market approaches which utilize Chicago Mercantile Exchange ("CME") quoted prices and other observable inputs. Futures and options contracts settled on the CME are classified as Level 1 valuations. Swap contracts are valued using a pricing model based on CME inputs and are subject to nonperformance risk outside of the exit price. These contracts are classified as Level 2 valuations. The application of CVAs did not materially affect the fair value of these assets and liabilities at September 30, 2017.

TVA maintains policies and procedures to value commodity contracts using what is believed to be the best and most relevant data available. In addition, TVA's risk management group reviews valuations and pricing data. TVA retains independent pricing vendors to assist in valuing certain instruments without market liquidity.

#### Fair Value Considerations

In determining the fair value of its financial instruments, TVA considers the source of observable market data inputs, liquidity of the instrument, credit risk, and risk of nonperformance of itself or the counterparty to the contract. The conditions and criteria used to assess these factors are described below.

**Sources of Market Assumptions.** TVA derives its financial instrument market assumptions from market data sources (e.g., CME and Moody's Investors Service, Inc. ("Moody's")). In some cases, where market data is not readily available, TVA uses comparable market sources and empirical evidence to derive market assumptions and determine a financial instrument's fair value.

**Market Liquidity.** Market liquidity is assessed by TVA based on criteria as to whether the financial instrument trades in an active or inactive market. A financial instrument is considered to be in an active market if the prices are fully transparent to the market participants, the prices can be measured by market bid and ask quotes, the market has a relatively high trading

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volume, and the market has a significant number of market participants that will allow the market to rapidly absorb the quantity of the assets traded without significantly affecting the market price. Other factors TVA considers when determining whether a market is active or inactive include the presence of government or regulatory control over pricing that could make it difficult to establish a market-based price upon entering into a transaction.

**Nonperformance Risk.** In determining the potential impact of nonperformance risk, which includes credit risk, TVA considers changes in current market conditions, readily available information on nonperformance risk, letters of credit, collateral, other arrangements available, and the nature of master netting arrangements. TVA is a counterparty to derivative instruments that subject TVA to nonperformance risk. Nonperformance risk on the majority of investments and certain exchange-traded instruments held by TVA is incorporated into the exit price that is derived from quoted market data that is used to value the investment.

Nonperformance risk for most of TVA's derivative instruments is an adjustment to the initial asset/liability fair value. TVA adjusts for nonperformance risk, both of TVA (for liabilities) and the counterparty (for assets), by applying a CVA. TVA determines an appropriate CVA for each applicable financial instrument based on the term of the instrument and TVA's or the counterparty's credit rating as obtained from Moody's. For companies that do not have an observable credit rating, TVA uses internal analysis to assign a comparable rating to the company. TVA discounts each financial instrument using the historical default rate (as reported by Moody's for CY 1983 to CY 2016) for companies with a similar credit rating over a time period consistent with the remaining term of the contract.

All derivative instruments are analyzed individually and are subject to unique risk exposures. The application of CVAs resulted in a less than \$1 million decrease in the fair value of assets and a \$1 million decrease in the fair value of liabilities at September 30, 2017.

**Collateral.** TVA's interest rate swaps, currency swaps, and commodity derivatives under the FTP contain contract provisions that require a party to post collateral (in a form such as cash or a letter of credit) when the party's liability balance under the agreement exceeds a certain threshold. See Note 15 — Other Derivative Instruments — Collateral for a discussion of collateral related to TVA's derivative liabilities.

## **New Accounting Standards and Interpretations**

See Note 2 for a discussion of recent accounting standards and pronouncements which were issued by the Financial Accounting Standards Board ("FASB"), became effective for TVA, or were adopted by TVA during the presented periods.

## **Legislative and Regulatory Matters**

TVA continues to monitor how regulatory agencies are interpreting and implementing the provisions of the Dodd-Frank Wall Street Reform and Consumer Protection Act, which was enacted in July 2010. As a result of this act and its implementing regulations, TVA has become subject to recordkeeping, reporting, and reconciliation requirements related to its derivative transactions. In addition, depending on how regulatory agencies interpret and implement the provisions of this act, TVA's hedging costs may increase, and TVA may have to post additional collateral and margin in connection with its derivative transactions.

For a discussion of environmental legislation and regulation, see Item 1, Business — Environmental Matters.

TVA does not engage, and does not control any entity that is engaged, in any activity listed under Section 13(r) of the Exchange Act, which requires certain issuers to disclose certain activities relating to Iran involving the issuer and its affiliates. Based on information supplied by each such person, none of TVA's directors and executive officers are

involved in any such activities. While TVA is an agency and instrumentality of the United States of America, TVA does not believe its disclosure obligations, if any, under Section 13(r) extend to the activities of any other departments, divisions, or agencies of the United States.

#### Environmental Matters

See Item 1, Business — Environmental Matters, which discussion is incorporated by reference into this Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations.

#### Legal Proceedings

From time to time, TVA is party to or otherwise involved in lawsuits, claims, proceedings, investigations, and other legal matters ("Legal Proceedings") that have arisen in the ordinary course of conducting its activities, as a result of catastrophic events or otherwise. As of September 30, 2017, TVA had accrued approximately \$22 million with respect to Legal Proceedings. No assurance can be given that TVA will not be subject to significant additional claims and liabilities. If actual liabilities significantly exceed the estimates made, TVA's results of operations, liquidity, and financial condition could be materially adversely affected.



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For a discussion of certain current material Legal Proceedings, see Note 8 and Note 21 — Legal Proceedings, which discussions are incorporated into this Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations.

### Risk Management Activities

TVA is exposed to various market risks. These market risks include risks related to commodity prices, investment prices, interest rates, currency exchange rates, inflation, and counterparty credit and performance risk. To help manage certain of these risks, TVA has entered into various derivative transactions, including commodity option contracts, forward contracts, swaps, swaptions, futures, and options on futures. Other than certain derivative instruments in its trust investment funds, it is TVA's policy to enter into these derivative transactions solely for hedging purposes and not for speculative purposes. TVA plans to continue to manage fuel price volatility through various methods, but is currently evaluating the future use of financial instruments. See Note 15.

### Risk Governance

The Enterprise Risk Council ("ERC") is responsible for the highest level of risk oversight at TVA and is also responsible for communicating enterprise-wide risks with policy implications to the TVA Board or a designated TVA Board committee. The ERC is comprised of the Executive Management Committee ("EMC") and the Chief Risk Officer ("CRO") who will act as Chair. ERC members may invite additional attendees to meetings as non-voting participants. The ERC has established a subordinate Portfolio Risk Oversight Committee ("PROC"), which is comprised of business unit leaders with specific expertise. PROC is responsible for the evaluation of TVA's portfolio risk management processes and infrastructure for power, fuel, and other commodities critical to TVA's power supply.

TVA has a designated Enterprise Risk Management ("ERM") organization within its Financial Services organization responsible for (1) establishing enterprise risk management policies and guidelines, (2) developing an enterprise risk profile aligned with TVA's strategic objectives, (3) performing annual risk assessments across all TVA business units, (4) monitoring and reporting on identified enterprise risks and emerging risks, (5) facilitating enterprise risk discussions with the risk subject matter experts across the organization and at the ERC and TVA Board levels, and (6) developing and improving TVA's risk awareness culture. TVA has cataloged major short-term and long-term enterprise level risks across the organization. A discussion of significant risks is presented in Item 1A, Risk Factors.

### Commodity Price Risk

TVA is exposed to effects of market fluctuations in the price of commodities that are critical to its operations, including electricity, coal, and natural gas. The magnitude of exposure to these risks is influenced by many factors including contract terms and market liquidity. TVA's commodity price risk is substantially mitigated by its cost-based rates, including its total fuel cost adjustment, and long-term fixed price commodity contracts.

TVA previously used its FTP to help manage cost volatility for its wholesale and directly served customers. Although management has suspended the use of financial instruments under the program, certain natural gas hedges remained in place at September 30, 2017, and 2016, for the mitigation of risks associated with the price of natural gas. A hypothetical 10 percent decline in the market price of natural gas on September 30, 2017, and 2016, would have resulted in decreases of approximately \$1 million and \$6 million, respectively, in the fair value of TVA's natural gas trading derivative instruments at these dates.

Additionally, TVA manages risk with commodity contract derivatives for both coal and natural gas that require physical delivery of the contracted quantity. A hypothetical 10 percent decline in the market price of coal on September 30, 2017, and 2016, would have resulted in decreases of approximately \$36 million and \$41 million,

respectively, in the fair value of TVA's coal derivative instruments at these dates. A hypothetical 10 percent decline in the market price of natural gas on September 30, 2017, and 2016, would have resulted in decreases of approximately \$84 million and \$45 million, respectively, in the fair value of TVA's natural gas derivative instruments at these dates.

#### Investment Price Risk

TVA's investment price risk relates primarily to investments in TVA's NDT, ART, pension fund, SERP, and DCP.

Nuclear Decommissioning Trust. The NDT is generally designed to achieve a return in line with overall equity market performance. The assets of the trust are invested in debt and equity securities, private partnerships and limited liability companies, and certain derivative instruments including forwards, futures, options, and swaps, and through these investments the trust has exposure to U.S. equities, international equities, real estate investment trusts, high-yield debt, domestic debt, U.S. Treasury Inflation-Protected Securities ("TIPS"), commodities, and private real estate, private equity, and absolute return strategies. At September 30, 2017, and 2016, an immediate 10 percent decrease in the price of the investments in the trust would have reduced the value of the trust by \$188 million and \$165 million, respectively.

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**Asset Retirement Trust.** The ART is presently invested to achieve a return in line with equity and debt market performance. The assets of the trust are invested in securities directly and indirectly through commingled funds. At September 30, 2017, and 2016, an immediate 10 percent decrease in the price of the investments in the trust would have reduced the value of the trust by \$63 million and \$52 million, respectively.

**Qualified Pension Plan.** The TVARS Board's current asset allocation policy for the investment of qualified pension plan assets has targets of 47 percent equity including global public and private equity investments, 30 percent fixed income securities, and 23 percent real assets including public and private real asset investments. TVARS has a long-term investment plan that contains a dynamic de-risking strategy which will allocate investments to assets that better match the liability, such as long duration fixed income securities, over time as improved funding status targets are met. Pursuant to the TVARS Rules and Regulations, any proposed changes in asset allocation that would change the system's assumed rate of investment return are subject to TVA's review and veto.

As set forth above, the qualified pension plan assets are invested across global public equity, private equity, safety oriented fixed income, opportunistic fixed income, public real assets, and private real assets. The TVARS asset allocation policy includes permissible deviations from these target allocations. The TVARS Board can take action, as appropriate, to rebalance the system's assets consistent with the asset allocation policy. At September 30, 2017, and 2016, an immediate 10 percent decrease in the value of the net assets of the fund would have reduced the value of the fund by approximately \$799 million and \$715 million, respectively.

**Supplemental Executive Retirement Plan.** The SERP is a non-qualified defined benefit pension plan similar to those typically found in other companies in TVA's peer group and is provided to selected employees of TVA. TVA's SERP was created to recruit and retain key executives. The plan is designed to provide a competitive level of retirement benefits in excess of the limitations on contributions and benefits imposed by TVA's qualified defined benefit plan and Internal Revenue Code Section 415 limits on qualified retirement plans. The SERP currently targets an asset allocation policy for its plan assets of 65 percent equity securities, which includes U.S. and non-U.S. equities, and 35 percent fixed income securities. The SERP plan assets are presently invested to achieve a return in line with overall equity market performance. At September 30, 2017, and 2016, an immediate 10 percent decrease in the value of the SERP investments would have reduced the value of the investments by \$6 million and \$5 million, respectively.

**Deferred Compensation Plan.** The DCP is designed to provide participants with the ability to defer compensation until employment with TVA ends. The plan assists in the recruitment of top executive talent for TVA. As in other corporations, deferred compensation can be an integral part of a total compensation package. Assets currently include deferral balances. The default return on investment of the accounts is interest calculated based on the composite rate of all marketable U.S. Treasury issues. Executives may alternatively choose to have their balances adjusted based on the return of certain mutual funds. At September 30, 2017, and 2016, an immediate 10 percent decrease in the value of the deferred compensation accounts would have reduced the value of the accounts by \$3 million and \$4 million, respectively.

## Interest Rate Risk

TVA's interest rate risk is related primarily to its short-term investments, short-term debt, long-term debt, and interest rate derivatives.

**Investments.** At September 30, 2017, TVA had \$300 million of cash and cash equivalents, and the average balance of cash and cash equivalents for 2017 was \$336 million. The average interest rate that TVA received on its short-term investments during 2017 was less than one percent. If the rates of interest that TVA received on its short-term investments during 2017 were zero percent, TVA would have received approximately \$2 million less in interest from its short-term investments during 2017. At September 30, 2016, TVA had \$300 million of cash and cash equivalents,

and the average balance of cash and cash equivalents for 2016 was \$363 million. The average interest rate that TVA received on its short-term investments during 2016 was less than one percent. If the rates that TVA received on its short-term investments during 2016 were zero percent, TVA would have received approximately \$1 million less in interest from its short-term investments during 2016. In addition to affecting the amount of interest that TVA receives from its short-term investments, changes in interest rates could affect the value of the investments in its pension plan, ART, NDT, SERP, and DCP. See Risk Management Activities — Investment Price Risk above.

**Short-Term Debt.** At September 30, 2017, TVA's short-term borrowings were \$2.0 billion, and the current maturities of long-term debt were \$1.8 billion. Based on TVA's interest rate exposure at September 30, 2017, an immediate one percentage point increase in interest rates would have resulted in an increase of \$38 million in TVA's short-term interest expense. At September 30, 2016, TVA's short-term borrowings were \$1.4 billion, and the current maturities of long-term debt were \$1.6 billion. Based on TVA's interest rate exposure at September 30, 2016, an immediate one percentage point increase in interest rates would have resulted in an increase of \$30 million in TVA's short-term interest expense.

**Long-Term Debt.** At September 30, 2017, and 2016, the interest rates on all of TVA's outstanding long-term debt were fixed (or subject only to downward adjustment under certain conditions). Accordingly, an immediate one percentage point increase in interest rates would not have affected TVA's interest expense associated with its long-term debt. When TVA's long-

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term debt matures or is redeemed, however, TVA typically refinances debt in whole or in part by issuing additional debt. Accordingly, if interest rates are high when TVA issues this additional debt, TVA's cash flows, results of operations, and financial condition may be adversely affected. This risk is somewhat mitigated by the fact that TVA's debt portfolio is diversified in terms of maturities and has a long average life. At September 30, 2017, and 2016, the average life of TVA's debt portfolio was 16.6 years and 16.8 years, respectively. A schedule of TVA's debt maturities is contained in Note 13 — Debt Outstanding.

**Interest Rate Derivatives.** Changes in interest rates also affect the mark-to-market valuation of TVA's interest rate derivatives. See Note 15 — Derivatives Not Receiving Hedge Accounting Treatment — Interest Rate Derivatives. TVA had four interest rate swaps outstanding at September 30, 2017, and September 30, 2016. Net unrealized gains and losses on these instruments are reflected on TVA's consolidated balance sheets in a regulatory asset account, and realized gains and losses are reflected in earnings. Based on TVA's interest rate exposure at September 30, 2017, an immediate one-half percentage point decrease in interest rates would have increased the interest rate swap liabilities by \$233 million. Based on TVA's interest rate exposure at September 30, 2016, an immediate one-half percentage point decrease in interest rates would have increased the interest rate swap liabilities by \$294 million.

**Currency Exchange Rate Risk**

Over the next several years, TVA plans to spend a significant amount of capital on clean air projects, capacity expansion, and other projects. A portion of this amount may be spent on contracts that are denominated in one or more foreign currencies. Additionally, TVA's three issues of Bonds denominated in British pounds sterling are hedged by currency swap agreements. The value of the U.S. dollar compared with other currencies has fluctuated widely in recent years, including recent fluctuations in the U.S. dollar to British pound sterling exchange rate primarily driven by the "BREXIT" vote for the United Kingdom to leave the European Union. If not effectively managed, foreign currency exposure could negatively impact TVA's counterparty risk, cash flows, results of operations, and financial condition.

**ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK**

Quantitative and qualitative disclosures about market risk are reported in Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations — Risk Management Activities, which discussion is incorporated into this Item 7A, Quantitative and Qualitative Disclosures About Market Risk.



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## ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

TENNESSEE VALLEY AUTHORITY  
CONSOLIDATED STATEMENTS OF OPERATIONS

For the years ended September 30

(in millions)

	2017	2016	2015
Operating revenues			
Revenue from sales of electricity	\$10,586	\$10,461	\$10,847
Other revenue	153	155	156
Total operating revenues	10,739	10,616	11,003
Operating expenses			
Fuel	2,169	2,126	2,444
Purchased power	991	964	950
Operating and maintenance	3,362	2,842	2,838
Depreciation and amortization	1,717	1,836	2,031
Tax equivalents	525	522	525
Total operating expenses	8,764	8,290	8,788
Operating income	1,975	2,326	2,215
Other income (expense), net	56	43	29
Interest expense			
Interest expense	1,346	1,371	1,347
Allowance for funds used during construction	—	(235 )	(214 )
Net interest expense	1,346	1,136	1,133
Net income (loss)	\$685	\$1,233	\$1,111

The accompanying notes are an integral part of these consolidated financial statements.

TENNESSEE VALLEY AUTHORITY  
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

For the years ended September 30

(in millions)

	2017	2016	2015
Net income (loss)	\$685	\$1,233	\$1,111
Other comprehensive income (loss)			
Net unrealized gain (loss) on cash flow hedges	59	(139 )	(72 )
Reclassification to earnings from cash flow hedges	(26 )	129	65
Total other comprehensive income (loss)	\$33	\$(10 )	\$(7 )
Total comprehensive income (loss)	\$718	\$1,223	\$1,104

The accompanying notes are an integral part of these consolidated financial statements.

Table of ContentsTENNESSEE VALLEY AUTHORITY  
CONSOLIDATED BALANCE SHEETS

At September 30

(in millions)

## ASSETS

	2017	2016
Current assets		
Cash and cash equivalents	\$ 300	\$ 300
Accounts receivable, net	1,569	1,747
Inventories, net	1,065	993
Regulatory assets	447	536
Other current assets	65	68
Total current assets	3,446	3,644
Property, plant, and equipment		
Completed plant	58,947	51,564
Less accumulated depreciation	(28,404 )	(27,592 )
Net completed plant	30,543	23,972
Construction in progress	2,842	8,458
Nuclear fuel	1,401	1,450
Capital leases	161	163
Total property, plant, and equipment, net	34,947	34,043
Investment funds	2,603	2,257
Regulatory and other long-term assets		
Regulatory assets	8,698	10,164
Other long-term assets	323	386
Total regulatory and other long-term assets	9,021	10,550
Total assets	\$ 50,017	\$ 50,494

The accompanying notes are an integral part of these consolidated financial statements.





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CONSOLIDATED BALANCE SHEETS

At September 30

(in millions)

## LIABILITIES AND PROPRIETARY CAPITAL

	2017	2016
Current liabilities		
Accounts payable and accrued liabilities	\$ 1,940	\$ 2,163
Accrued interest	346	363
Current portion of leaseback obligations	37	58
Current portion of energy prepayment obligations	100	100
Regulatory liabilities	163	154
Short-term debt, net	1,998	1,407
Current maturities of power bonds	1,728	1,555
Current maturities of long-term debt of variable interest entities	36	35
Current maturities of notes payable	53	27
Total current liabilities	6,401	5,862
Other liabilities		
Post-retirement and post-employment benefit obligations	5,477	6,929
Asset retirement obligations	4,176	3,840
Other long-term liabilities	3,055	2,773
Leaseback obligations	302	409
Energy prepayment obligations	10	110
Regulatory liabilities	25	3
Total other liabilities	13,045	14,064
Long-term debt, net		
Long-term power bonds, net	20,205	20,901
Long-term debt of variable interest entities, net	1,164	1,199
Long-term notes payable	69	48
Total long-term debt, net	21,438	22,148
Total liabilities	40,884	42,074
Commitments and contingencies (Note 21)		
Proprietary capital		
Power program appropriation investment	258	258
Power program retained earnings	8,282	7,594
Total power program proprietary capital	8,540	7,852
Nonpower programs appropriation investment, net	572	580
Accumulated other comprehensive income (loss)	21	(12 )
Total proprietary capital	9,133	8,420
Total liabilities and proprietary capital	\$ 50,017	\$ 50,494

The accompanying notes are an integral part of these consolidated financial statements.



Table of ContentsTENNESSEE VALLEY AUTHORITY  
CONSOLIDATED STATEMENTS OF CASH FLOWSFor the years ended September 30  
(in millions)

	2017	2016	2015
Cash flows from operating activities			
Net income (loss)	\$685	\$1,233	\$1,111
Adjustments to reconcile net income (loss) to net cash provided by operating activities			
Depreciation and amortization (including amortization of debt issuance costs and premiums/discounts)	1,763	1,882	2,077
Amortization of nuclear fuel cost	341	287	277
Non-cash retirement benefit expense	837	327	332
Prepayment credits applied to revenue	(100 )	(100 )	(100 )
Fuel cost adjustment deferral	98	(83 )	(6 )
Fuel cost tax equivalents	5	(16 )	(18 )
Changes in current assets and liabilities			
Accounts receivable, net	230	(83 )	93
Inventories and other current assets, net	1	50	(12 )
Accounts payable and accrued liabilities	(119 )	(4 )	(121 )
Accrued interest	(17 )	(3 )	(13 )
Regulatory asset costs	(50 )	(31 )	(23 )
Pension contributions	(805 )	(281 )	(282 )
Settlements of asset retirement obligations	(123 )	(139 )	(58 )
Other, net	(10 )	3	58
Net cash provided by operating activities	2,736	3,042	3,315
Cash flows from investing activities			
Construction expenditures	(2,153 )	(2,710 )	(2,850 )
Combustion turbine asset acquisition	—	—	(342 )
Nuclear fuel expenditures	(305 )	(300 )	(350 )
Purchases of investments	(49 )	(50 )	(52 )
Loans and other receivables			
Advances	(11 )	(10 )	(17 )
Repayments	8	7	8
Other, net	(26 )	(50 )	18
Net cash used in investing activities	(2,536 )	(3,113 )	(3,585 )
Cash flows from financing activities			
Long-term debt			
Issues of power bonds	999	—	973
Redemptions and repurchases of power bonds	(1,558 )	(76 )	(1,180 )
Redemptions of notes payable	(27 )	—	—
Payments on debt of variable interest entities	(35 )	(33 )	(32 )
Short-term debt issues (redemptions), net	583	370	437
Payments on leases and leasebacks	(136 )	(159 )	(80 )
Financing costs, net	(4 )	—	(7 )
Payments to U.S. Treasury	(5 )	(6 )	(5 )
Other, net	(17 )	(25 )	(36 )
Net cash (used in) provided by financing activities	(200 )	71	70

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Net change in cash and cash equivalents	—	—	(200 )
Cash and cash equivalents at beginning of year	300	300	500
Cash and cash equivalents at end of year	\$300	\$300	\$300

The accompanying notes are an integral part of these consolidated financial statements.

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TENNESSEE VALLEY AUTHORITY  
CONSOLIDATED STATEMENTS OF CHANGES IN PROPRIETARY CAPITAL  
For the years ended September 30  
(in millions)

	Power Program Appropriation Investment	Power Program Retained Earnings	Nonpower Programs Appropriation Investment, Net	Accumulated Other Comprehensive Income (Loss) from Net Gains (Losses) on Cash Flow Hedges	Total
Balance at September 30, 2014	\$ 258	\$ 5,240	\$ 601	\$ 5	\$6,104
Net income (loss)	—	1,122	(11 )	—	1,111
Total other comprehensive income (loss)	—	—	—	(7 )	(7 )
Return on power program appropriation investment	—	(5 )	—	—	(5 )
Balance at September 30, 2015	\$ 258	\$ 6,357	\$ 590	\$ (2 )	\$7,203
Net income (loss)	—	1,243	(10 )	—	1,233
Total other comprehensive income (loss)	—	—	—	(10 )	(10 )
Return on power program appropriation investment	—	(6 )	—	—	(6 )
Balance at September 30, 2016	\$ 258	\$ 7,594	\$ 580	\$ (12 )	\$8,420
Net income (loss)	—	693	(8 )	—	685
Total other comprehensive income (loss)	—	—	—	33	33
Return on power program appropriation investment	—	(5 )	—	—	(5 )
Balance at September 30, 2017	\$ 258	\$ 8,282	\$ 572	\$ 21	\$9,133

The accompanying notes are an integral part of these consolidated financial statements.

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## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollars in millions except where noted)

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## 1. Summary of Significant Accounting Policies

## General

The Tennessee Valley Authority ("TVA") is a corporate agency and instrumentality of the United States that was created in 1933 by legislation enacted by the United States ("U.S.") Congress in response to a request by President Franklin D. Roosevelt. TVA was created to, among other things, improve navigation on the Tennessee River, reduce the damage from destructive flood waters within the Tennessee River system and downstream on the lower Ohio and Mississippi Rivers, further the economic development of TVA's service area in the southeastern United States, and sell the electricity generated at the facilities TVA operates.

Today, TVA operates the nation's largest public power system and supplies power in most of Tennessee, northern Alabama, northeastern Mississippi, and southwestern Kentucky and in portions of northern Georgia, western North Carolina, and southwestern Virginia to a population of over nine million people.

TVA also manages the Tennessee River, its tributaries, and certain shorelines to provide, among other things, year-round navigation, flood damage reduction, and affordable and reliable electricity. Consistent with these primary purposes, TVA also manages the river system and public lands to provide recreational opportunities, adequate water supply, improved water quality, cultural and natural resource protection, and economic development.

The power program has historically been separate and distinct from the stewardship programs. It is required to be self-supporting from power revenues and proceeds from power financings, such as proceeds from the issuance of bonds, notes, or other evidences of indebtedness ("Bonds"). Although TVA does not currently receive congressional appropriations, it is required to make annual payments to the United States Department of the Treasury ("U.S. Treasury") as a return on the government's appropriation investment in TVA's power facilities (the "Power Program Appropriation Investment"). In the 1998 Energy and Water Development Appropriations Act, Congress directed TVA to fund essential stewardship activities related to its management of the Tennessee River system and nonpower or stewardship properties with power revenues in the event that there were insufficient appropriations or other available funds to pay for such activities in any fiscal year. Congress has not provided any appropriations to TVA to fund such activities since 1999. Consequently, during 2000, TVA began paying for



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essential stewardship activities primarily with power revenues, with the remainder funded with user fees and other forms of revenues derived in connection with those activities. The activities related to stewardship properties do not meet the criteria of an operating segment under accounting principles generally accepted in the United States of America ("GAAP"). Accordingly, these assets and properties are included as part of the power program, TVA's only operating segment.

Power rates are established by the TVA Board of Directors (the "TVA Board") as authorized by the Tennessee Valley Authority Act of 1933, as amended, 16 U.S.C. §§ 831-831ee (the "TVA Act"). The TVA Act requires TVA to charge rates for power that will produce gross revenues sufficient to provide funds for operation, maintenance, and administration of its power system; payments to states and counties in lieu of taxes ("tax equivalents"); debt service on outstanding indebtedness; payments to the U.S. Treasury in repayment of and as a return on the Power Program Appropriation Investment; and such additional margin as the TVA Board may consider desirable for investment in power system assets, retirement of outstanding Bonds in advance of maturity, additional reduction of the Power Program Appropriation Investment, and other purposes connected with TVA's power business. In setting TVA's rates, the TVA Board is charged by the TVA Act to have due regard for the primary objectives of the TVA Act, including the objective that power shall be sold at rates as low as are feasible. Rates set by the TVA Board are not subject to review or approval by any state or other federal regulatory body.

### Fiscal Year

TVA's fiscal year ends September 30. Years (2017, 2016, etc.) refer to TVA's fiscal years unless they are preceded by "CY," in which case the references are to calendar years.

### Cost-Based Regulation

Since the TVA Board is authorized by the TVA Act to set rates for power sold to its customers, TVA is self-regulated. Additionally, TVA's regulated rates are designed to recover its costs. Based on current projections, TVA believes that rates, set at levels that will recover TVA's costs, can be charged and collected. As a result of these factors, TVA records certain assets and liabilities that result from the regulated ratemaking process that would not be recorded under GAAP for non-regulated entities. Regulatory assets generally represent incurred costs that have been deferred because such costs are probable of future recovery in customer rates. Regulatory liabilities generally represent obligations to make refunds to customers for previous collections for costs that are not likely to be incurred or deferral of gains that will be credited to customers in future periods. TVA assesses whether the regulatory assets are probable of future recovery by considering factors such as applicable regulatory changes, potential legislation, and changes in technology. Based on these assessments, TVA believes the existing regulatory assets are probable of recovery. This determination reflects the current regulatory and political environment and is subject to change in the future. If future recovery of regulatory assets ceases to be probable, or any of the other factors described above cease to be applicable, TVA would no longer be considered to be a regulated entity and would be required to write off these costs. All regulatory asset write offs would be required to be recognized in earnings in the period in which future recovery ceases to be probable.

### Basis of Presentation

The accompanying consolidated financial statements, which have been prepared in accordance with GAAP, include the accounts of TVA, wholly-owned direct subsidiaries, and variable interest entities ("VIE") of which TVA is the primary beneficiary. See Note 9 and Note 10. Intercompany balances and transactions have been eliminated in consolidation.

### Use of Estimates

The preparation of financial statements requires TVA to estimate the effects of various matters that are inherently uncertain as of the date of the consolidated financial statements. Although the consolidated financial statements are prepared in conformity with GAAP, TVA is required to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities, and the amounts of revenues and expenses reported during the reporting period. Each of these estimates varies in regard to the level of judgment involved and its potential impact on TVA's financial results. Estimates are considered critical either when a different estimate could have reasonably been used, or where changes in the estimate are reasonably likely to occur from period to period, and such use or change would materially impact TVA's financial condition, results of operations, or cash flows.

#### Reclassifications

Amounts previously presented in Cash flows from operating activities as Insurance recoveries of \$7 million and \$63 million for the years ended September 30, 2016 and 2015, respectively, are currently reported in Other, net.

#### Cash and Cash Equivalents

Cash includes cash on hand and non-interest bearing cash and deposit accounts. All highly liquid investments with original maturities of three months or less are considered cash equivalents.

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### Allowance for Uncollectible Accounts

The allowance for uncollectible accounts reflects TVA's estimate of probable losses inherent in its accounts and loans receivable balances. TVA determines the allowance based on known accounts, historical experience, and other currently available information including events such as customer bankruptcy and/or a customer failing to fulfill payment arrangements after 90 days. It also reflects TVA's corporate credit department's assessment of the financial condition of customers and the credit quality of the receivables.

The allowance for uncollectible accounts was less than \$1 million and \$1 million at September 30, 2017, and 2016, for accounts receivable. Additionally, loans receivable of \$118 million and \$141 million at September 30, 2017, and 2016, respectively, are included in Accounts receivable, net and Other long-term assets, for the current and long-term portions, respectively, and are reported net of allowances for uncollectible accounts of less than \$1 million and \$8 million at September 30, 2017, and 2016, respectively.

### Revenues

Revenues from power sales are recorded as electricity is delivered to customers. In addition to power sales invoiced and recorded during the month, TVA accrues estimated unbilled revenues for power sales provided to six customers whose billing date occurs prior to the end of the month. Exchange power sales are presented in the accompanying consolidated statements of operations as a component of Sales of electricity. Exchange power sales are sales of excess power after meeting TVA native load and directly served requirements. Native load refers to the customers on whose behalf a company, by statute, franchise, regulatory requirement, or contract, has undertaken an obligation to serve.

From time to time TVA transfers fiber optic capacity on TVA's network to telecommunications service carriers and local power company customers of TVA ("LPCs"). These transactions are structured as indefeasible rights of use ("IRUs"), which are the exclusive right to use a specified amount of fiber optic capacity for a specified term. TVA accounts for the consideration received on transfers of fiber optic capacity for cash and on all of the other elements deliverable under an IRU as revenue ratably over the term of the agreement. TVA does not recognize revenue on any contemporaneous exchanges of its fiber optic capacity for an IRU of fiber optic capacity of the counterparty to the exchange.

TVA engages in a wide array of arrangements in addition to power sales. TVA records revenue when it is realized or realizable and earned when all of the following criteria are met: persuasive evidence of an arrangement exists; delivery has occurred or services have been rendered; the price or fee is fixed or determinable; and collectability is reasonably assured. Revenues from activities related to TVA's overall mission are recorded as other operating revenue versus those that are not related to the overall mission, which are recorded in Other income (expense), net.

### Pre-Commercial Plant Operations

As part of the process of completing the construction of a generating unit, the electricity produced is used to serve the demands of the electric system. TVA estimates revenue from such pre-commercial generation based on the guidance provided by Federal Energy Regulatory Commission ("FERC") regulations. Watts Bar Nuclear Plant ("Watts Bar") Unit 2 commenced pre-commercial plant operations on June 3, 2016, and commercial operations began on October 19, 2016. In addition, the Paradise Combined Cycle Plant commenced pre-commercial plant operations on October 10, 2016, and commercial operations began on April 7, 2017. The Allen Combined Cycle Plant began pre-commercial operations on September 9, 2017. Estimated revenue of \$22 million and \$18 million related to these projects was capitalized to offset project costs for the years ended September 30, 2017, and 2016, respectively. TVA also capitalized related fuel costs for these three construction projects of approximately \$14 million and \$6 million during the years ended September 30, 2017, and 2016, respectively.

## Inventories

**Certain Fuel, Materials, and Supplies.** Materials and supplies inventories are valued using an average unit cost method. A new average cost is computed after each inventory purchase transaction, and inventory issuances are priced at the latest moving weighted average unit cost. Coal, fuel oil, and natural gas inventories are valued using an average cost method. A new weighted average cost is computed monthly, and monthly issues are priced accordingly.

**Allowance for Inventory Obsolescence.** TVA reviews material and supplies inventories by category and usage on a periodic basis. Each category is assigned a probability of becoming obsolete based on the type of material and historical usage data. Based on the estimated value of the inventory, TVA adjusts its allowance for inventory obsolescence.

**Emission Allowances.** TVA has emission allowances for sulfur dioxide ("SO<sub>2</sub>") and nitrogen oxides ("NO<sub>x</sub>") which are accounted for as inventory. The average cost of allowances used each month is charged to operating expense based on tons of SO<sub>2</sub> and NO<sub>x</sub> emitted during the respective compliance periods. Allowances granted to TVA by the Environmental Protection Agency ("EPA") are recorded at zero cost.

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Renewable Energy Credits. TVA accounts for Renewable Energy Credits ("RECs") using the specific identification cost method. RECs that are acquired through power purchases are recorded as inventory and charged to purchased power expense when the RECs are subsequently used or sold. TVA assigns a value to the RECs at the inception of power purchase arrangement using a relative fair value approach. RECs created through TVA-owned asset generation are recorded at zero cost.

## Property, Plant, and Equipment, and Depreciation

Property, Plant, and Equipment. Additions to plant are recorded at cost, which includes direct and indirect costs and may include allowance for funds used during construction ("AFUDC"), if eligible. The cost of current repairs and minor replacements is charged to operating expense. Nuclear fuel inventories, which are included in Property, plant, and equipment, are valued using the average cost method for raw materials and the specific identification method for nuclear fuel in a reactor. Amortization of nuclear fuel in a reactor is calculated on a units-of-production basis and is included in fuel expense.

Depreciation. TVA accounts for depreciation of its properties using the composite depreciation convention of accounting. Accordingly, the original cost of property retired is charged to accumulated depreciation. Depreciation is generally computed on a straight-line basis over the estimated service lives of the various classes of assets.

Depreciation rates are determined based on an external depreciation study. TVA concluded and implemented a new depreciation study effective October 1, 2016, resulting in approximately \$224 million less depreciation expense in 2017 compared to the prior year. This study will be updated at least every five years. Depreciation expense for the years ended September 30, 2017, 2016, and 2015 was \$1.3 billion, \$1.4 billion, and \$1.7 billion, respectively.

Depreciation expense expressed as a percentage of the average annual depreciable completed plant was 2.49 percent for 2017, 2.97 percent for 2016, and 3.71 percent for 2015. Average depreciation rates by asset class are as follows:

## Property, Plant, and Equipment

## Depreciation Rates

At September 30

(percent)

	2017	2016	2015
Asset Class			
Nuclear	2.66	2.37	2.81
Coal-fired	2.33	3.50	5.50
Hydroelectric	1.58	1.29	1.30
Gas and oil-fired	3.27	3.09	3.18
Transmission	1.34	2.80	2.78
Other	6.12	8.97	8.65

Nuclear. In September 2015, the Nuclear Regulatory Commission ("NRC") approved renewed licenses for Sequoyah Nuclear Plant ("Sequoyah") Units 1 and 2, which allow both units to operate for an additional 20 years, and TVA adjusted prospectively the Sequoyah depreciation rate.

Coal-Fired. In April 2011, TVA entered into two substantively similar agreements, one with the EPA and the other with Alabama, Kentucky, North Carolina, Tennessee, and three environmental advocacy groups (collectively, the "Environmental Agreements"). See Note 21 — Legal Proceedings — Environmental Agreements. Under the Environmental Agreements, TVA committed to retire 18 coal-fired units on a phased schedule, among other things.

Since its November 2013 meeting, the TVA Board has approved the retirement of certain coal-fired units. Units subsequently retired include: Widows Creek Fossil Plant ("Widows Creek") Units 7 and 8 on September 30, 2015; Colbert Fossil Plant ("Colbert") Units 1-5 on April 16, 2016; and Paradise Fossil Plant ("Paradise") Units 1 and 2 on

April 15, 2017.

Other pending TVA Board actions at September 30, 2017 are the retirement of Johnsonville Fossil Plant ("Johnsonville") Units 1-4 by December 31, 2017 and Allen Fossil Plant ("Allen") Units 1-3. The Allen units will be retired upon a completion of a natural gas-fired plant at the Allen location, but no later than December 31, 2018. TVA estimates that the natural gas-fired plant will be completed in the spring of 2018.

Depreciation rates are adjusted to reflect current assumptions so that the units will be fully depreciated by the applicable idle dates. As a result of TVA's decision to idle or retire units, TVA recognized \$104 million, \$139 million and \$383 million in accelerated depreciation expense related to the units during the years ended September 30, 2017, 2016, and 2015, respectively. Accelerated depreciation is based on the rate in effect at the time the decision is made to idle or retire a unit.

Capital Lease Agreements. Property, plant, and equipment also includes assets recorded under capital lease agreements. These primarily consist of a natural gas lateral pipeline, power production facilities, water treatment assets, and land of \$161 million and \$163 million at September 30, 2017 and 2016, respectively. Amortization expense related to capital leases is included in Depreciation and amortization in TVA's statement of operations, excluding leases and other financing

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obligations where regulatory accounting is applied. See Note 7 — Other Non-Current Regulatory Assets — Deferred Capital Leases and Other Financing Obligations.

On April 4, 2016, TVA entered into a letter agreement with Choctaw Generation Limited Partnership, LLLP (“CGLP”) for the reimbursement of certain capital costs and ongoing operating and maintenance costs related to assets recently constructed at the Red Hills lignite-fired power facility. These capital additions were required to comply with new Mercury and Air Toxics Standards. As a result of the new agreement, TVA was required to reassess a related 1997 power purchase and operating agreement (“PPOA”) with CGLP that was previously classified as an executory contract. This reassessment determined that the PPOA contained a capital lease and resulted in TVA recording a capital lease asset at the estimated fair value of \$76 million with an offsetting capital lease liability included in Accounts payable and accrued liabilities and Other long-term liabilities.

**Allowance for Funds Used During Construction.** TVA may capitalize interest on eligible projects as allowance for funds used during construction (“AFUDC”), based on the average interest rate of TVA’s outstanding debt. The allowance is applicable to construction in progress related to eligible projects with (1) an expected total project cost of \$1.0 billion or more, and (2) an estimated construction period of at least three years in duration. No AFUDC was capitalized for the year ended September 30, 2017, subsequent to the completion of Watts Bar Unit 2, which went into service in October 2016. TVA capitalized \$235 million and \$214 million of AFUDC for the years ended September 30, 2016, and 2015, respectively, related to the Watts Bar Unit 2 project.

**Software Costs.** TVA capitalizes certain costs incurred in connection with developing or obtaining internal-use software. Capitalized software costs are included in Property, plant, and equipment on the consolidated balance sheets and are generally amortized over seven years. At September 30, 2017, and 2016, unamortized computer software costs totaled \$42 million and \$27 million, respectively. Amortization expense related to capitalized computer software costs was \$26 million, \$43 million, and \$38 million for 2017, 2016, and 2015, respectively. Software costs that do not meet capitalization criteria are expensed as incurred.

**Impairment of Assets.** TVA evaluates long-lived assets for impairment when events or changes in circumstances indicate that the carrying value of such assets may not be recoverable. For long-lived assets, TVA bases its evaluation on impairment indicators such as the nature of the assets, the future economic benefit of the assets, any historical or future profitability measurements, its regulatory approval and ability to set rates at levels that allow for recoverability of the assets, and other external market conditions or factors that may be present. If such impairment indicators are present or other factors exist that indicate that the carrying amount of an asset may not be recoverable, TVA determines whether an impairment has occurred based on an estimate of undiscounted cash flows attributable to the asset as compared with the carrying value of the asset. If an impairment has occurred, the amount of the impairment recognized is measured as the excess of the asset’s carrying value over its fair value. Additionally, TVA regularly evaluates construction projects. If the project is canceled or deemed to have no future economic benefit, the project is written off as an asset impairment or, upon TVA Board approval, reclassified as a regulatory asset.

## Decommissioning Costs

TVA recognizes legal obligations associated with the future retirement of certain tangible long-lived assets. These obligations relate to fossil fuel-fired generating plants, nuclear generating plants, hydroelectric generating plants/dams, transmission structures, and other property-related assets. These other property-related assets include, but are not limited to, easements and coal rights. Activities involved with retiring these assets could include decontamination and demolition of structures, removal and disposal of wastes, and site restoration. Revisions to the estimates of asset retirement obligations (“AROs”) are made whenever factors indicate that the timing or amounts of estimated cash flows have changed materially. Any accretion or depreciation expense related to these liabilities and assets is charged to a regulatory asset. See Note 7 — Nuclear Decommissioning Costs and Non-Nuclear

Decommissioning Costs and Note 12.

Blended Low-Enriched Uranium Program

Under the blended low-enriched uranium ("BLEU") program, TVA, the U.S. Department of Energy ("DOE"), and certain nuclear fuel contractors have entered into agreements providing for the DOE's surplus of enriched uranium to be blended with other uranium down to a level that allows the blended uranium to be fabricated into fuel that can be used in nuclear power plants. Under the terms of an interagency agreement between TVA and the DOE, in exchange for supplying highly enriched uranium materials to the appropriate third-party fuel processors for processing into usable BLEU fuel for TVA, the DOE participates to a degree in the savings generated by TVA's use of this blended nuclear fuel. TVA accrues an obligation with each BLEU reload batch related to the portion of the ultimate future payments estimated to be attributable to the BLEU fuel currently in use. TVA estimated DOE's portion of the cost savings from the program to be \$165 million. The last of the BLEU fuel was loaded in 2017. At September 30, 2017, TVA had paid out approximately \$164 million for this program, and the obligation recorded was \$1 million.



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### Investment Funds

Investment funds consist primarily of trust funds designated to fund decommissioning requirements (see Note 21 — Contingencies — Decommissioning Costs), the Supplemental Executive Retirement Plan ("SERP") (see Note 20 — Overview of Plans and Benefits — Supplemental Executive Retirement Plan), and the Deferred Compensation Plan ("DCP"). The Nuclear Decommissioning Trust ("NDT") holds funds primarily for the ultimate decommissioning of TVA's nuclear power plants. The Asset Retirement Trust ("ART") holds funds primarily for the costs related to the future closure and retirement of TVA's other long-lived assets. The NDT, ART, SERP, and DCP funds are invested in portfolios of securities generally designed to achieve a return in line with overall equity and debt market performance. The NDT, ART, SERP, and DCP funds are all classified as trading.

### Energy Prepayment Obligations

In 2004, TVA and its largest customer, Memphis Light, Gas and Water Division ("MLGW"), entered into an energy prepayment agreement under which MLGW prepaid TVA \$1.5 billion for the future costs of electricity to be delivered by TVA to MLGW over a period of 180 months. TVA accounted for the prepayment as unearned revenue and is reporting the obligation to deliver power under this arrangement as Energy prepayment obligations and Current portion of energy prepayment obligations on the September 30, 2017 and 2016 Consolidated Balance Sheets. TVA expects to recognize approximately \$100 million of noncash revenue in each year of the arrangement as electricity is delivered to MLGW based on the ratio of units of kilowatt hours delivered to total units of kilowatt hours under contract. At September 30, 2017, approximately \$1.4 billion had been recognized as noncash revenue on a cumulative basis during the life of the agreement, \$100 million of which was recognized as noncash revenue during each of 2017, 2016, and 2015.

Discounts to account for the time value of money, which are recorded as a reduction to electricity sales, amounted to \$46 million for each of the years ended September 30, 2017, 2016, and 2015.

### Insurance

Although TVA uses private companies to administer its healthcare plans for eligible active and retired employees not covered by Medicare, TVA does not purchase health insurance. Third-party actuarial specialists assist TVA in determining certain liabilities for self-insured claims. TVA recovers the costs of claims through power rates and through adjustments to the participants' contributions to their benefit plans. These liabilities are included in Other liabilities on the balance sheets.

TVA sponsors an Owner Controlled Insurance Program which provides workers' compensation and liability insurance for a select group of contractors performing maintenance, modifications, outage, and new construction activities at TVA facilities.

The Federal Employees' Compensation Act ("FECA") governs liability to employees for service-connected injuries. TVA purchases excess workers' compensation insurance above a self-insured retention.

In addition to excess workers' compensation insurance, TVA purchases the following types of insurance:

- Nuclear liability insurance; nuclear property, decommissioning, and decontamination insurance; and nuclear accidental outage insurance. See Note 21 — Contingencies — Nuclear Insurance.

- Excess liability insurance for aviation, auto, marine, and general liability exposures.

Property insurance for certain conventional (non-nuclear) assets.

The insurance policies are subject to the terms and conditions of the specific policy, including deductibles or self-insured retentions. To the extent insurance would not provide either a partial or total recovery of the costs associated with a loss, TVA would have to recover any such costs through other means, including through power rates.

#### Research and Development Costs

Research and development costs are expensed when incurred. TVA's research programs include those related to power delivery technologies, emerging technologies (clean energy, renewables, distributed resources, and energy efficiency), technologies related to generation (fossil fuel, nuclear, and hydroelectric), and environmental technologies.

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Tax Equivalents

The TVA Act requires TVA to make payments to states and counties in which TVA conducts its power operations and in which TVA has acquired power properties previously subject to state and local taxation. The total amount of these payments is five percent of gross revenues from sales of power during the preceding year, excluding sales or deliveries to other federal agencies and off-system sales with other utilities, with a provision for minimum payments under certain circumstances. TVA calculates tax equivalent expense by subtracting the prior year fuel cost-related tax equivalent regulatory asset or liability from the payments made to the states and counties during the current year and adding back the current year fuel cost-related tax equivalent regulatory asset or liability. Fuel cost-related tax equivalent expense is recognized in the same accounting period in which the fuel cost-related revenue is recognized.

Maintenance Costs

TVA records maintenance costs and repairs related to its property, plant, and equipment in the consolidated statements of operations as they are incurred except for the recording of certain regulatory assets for retirement and removal costs.

2. Impact of New Accounting Standards and Interpretations

The following are accounting standard updates issued by the Financial Accounting Standards Board ("FASB") that TVA adopted during 2017.

Consolidation

Description	This guidance amends the consolidation analysis for VIEs as well as voting interest entities. The standard reduces the number of consolidation models through the elimination of the indefinite deferral for certain entities that was previously allowed and places more emphasis on risk of loss when determining a controlling financial interest. This guidance allows for either a full retrospective or a modified retrospective application.
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Effective Date for TVA	October 1, 2016
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Effect on the Financial Statements or Other Significant Matters	The adoption of the standard did not materially impact TVA's financial condition, results of operations, or cash flows.
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Business Combinations

Description	This guidance clarifies the definition of a business by providing guidelines to determine when a set of assets and activities constitutes a business. The standard says that when substantially all of the fair value of the gross assets acquired (or disposed of) is concentrated in a single identifiable asset or a group of similar identifiable assets, the set of assets and activities is not a business. If this characteristic is not met, the amendments in this update (1) require that to be considered a business, a set must include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create output and (2) remove the evaluation of whether a market participant could replace missing elements. The amendments provide a framework to assist entities in evaluating whether both an input and a substantive process are present. The framework includes two sets of criteria to consider that depend on whether a set of assets and activities has outputs. Although outputs are not required for a set of assets and activities to be a business, outputs generally are a key element of a business; therefore, the FASB has developed more stringent criteria for sets of assets and activities without
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outputs. This standard also updates the definition of the term output so that the term is consistent with how outputs are described in the new Revenue Recognition guidance.

Effective Date  
for TVA July 1, 2017

Effect on the  
Financial  
Statements or  
Other  
Significant  
Matters

As a result of adopting the standard, TVA accounted for purchase of the equity interests in two special purpose entities in 2017 as asset acquisitions, and not business combinations, because the entities did not meet the definition of a business under the new accounting standard.

Going Concern

Description

This amendment requires an entity's management to assess an entity's ability to continue as a going concern within one year after the date that the financial statements are issued or available to be issued. When management identifies conditions or events that raise substantial doubt about the entity's ability to continue as a going concern, management should consider whether its plans that are intended to mitigate those relevant conditions or events will alleviate the substantial doubt. If the substantial doubt can be alleviated as a result of consideration of management's plan, the entity should disclose certain information. If substantial doubt is not alleviated after consideration of management's plan, an entity should indicate in the footnotes that there is substantial doubt about the entity's ability to continue as a going concern within one year after the date that the final statements are issued or available to be issued. This assessment must be evaluated every reporting period including interim periods.

Effective Date  
for TVA September 30, 2017

Effect on the  
Financial  
Statements or  
Other  
Significant  
Matters

As a result of adopting the standard, management has assessed TVA's ability to continue as a going concern within one year after the financial statements are available to be issued, and there were no conditions or events that raise substantial doubt about TVA's ability to continue as a going concern. No additional disclosures are necessary.

The following accounting standards have been issued, but as of September 30, 2017, were not effective and had not been adopted by TVA.

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Derivatives and Hedging - Contingent Put and Call Options in Debt Instruments

Description	This guidance clarifies the requirements for assessing whether contingent call or put options that can accelerate the payment of principal on debt instruments are clearly and closely related to their debt hosts. An entity performing the assessment under the amendments in this update is required to assess the embedded call or put options solely in accordance with a four-step decision sequence. When the standard becomes effective, it will include interim periods within that fiscal year, and will be required to be applied using a modified retrospective transition.
Effective Date for TVA	The new standard was effective for TVA's interim and annual reporting periods beginning October 1, 2017. While early adoption was permitted, TVA did not adopt the standard early.
Effect on the Financial Statements or Other Significant Matters	TVA has two issues of Putable Automatic Rate Reset Securities ("PARRS") outstanding. After a fixed-rate period of five years, the coupon rate on the PARRS may automatically be reset downward under certain market conditions on an annual basis. The coupon rate reset on the PARRS is based on a calculation. If the coupon rate is going to be reset, holders may request, for a limited period of time, redemption of the PARRS at par value, with repayment of principal on the reset date. This put option is otherwise not available. For both series of PARRS, the coupon rate will reset downward on the reset date if the rate calculated is below the then-current coupon rate on the PARRS. TVA plans to assess whether these contingent put options that can accelerate the payment of principal on the PARRS continue to be clearly and closely related to their debt hosts under the new guidance. TVA plans to assess the put options in accordance with the four-step decision sequence clarified in the guidance. While a preliminary assessment indicates that TVA does not believe the new guidance will impact its current assessment, TVA will continue to evaluate the potential impact of the new guidance on its consolidated balance sheet.

Inventory Valuation

Description	This guidance changes the model used for the subsequent measurement of inventory from the previous lower of cost or market model to the lower of cost or net realizable value. The guidance applies only to inventory valued using methods other than last-in, first out or the retail inventory method (for example, first-in, first-out or average cost). This amendment is intended to simplify the subsequent measurement of inventory. When the standard becomes effective, it includes interim periods within the fiscal year that begins on that date and is required to be applied prospectively.
Effective Date for TVA	The new standard was effective for TVA's interim and annual reporting periods beginning October 1, 2017. While early adoption was permitted, TVA did not adopt the standard early.
Effect on the Financial Statements or Other Significant Matters	The adoption of this standard will not have a material impact on TVA's financial condition, results of operations, and cash flows.

Defined Benefit Costs

Description	This guidance changes how information about defined benefit costs for pension plans and other post-retirement benefit plans is presented in employer financial statements. The guidance requires employers that present a measure of operating income in their statement of income to include only the service cost component of net periodic pension cost and net periodic postretirement benefit cost in operating expenses (together with other employee compensation costs). The other components of net benefit cost, including amortization of prior service cost/credit and settlement and curtailment effects, are to be included in nonoperating expenses. Additionally, the guidance stipulates that only the service cost component of net benefit cost is eligible for capitalization in assets.
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Effective Date for TVA The new standard is effective for TVA's interim and annual reporting periods beginning October 1, 2018. While early adoption is permitted, TVA does not currently plan to adopt the standard early.

Effect on the Financial Statements or Other Significant Matters TVA has evaluated the impact of adopting this guidance, and if the guidance had been effective for TVA for the years ended September 30, 2017, 2016, and 2015, TVA would have reclassified \$758 million, \$179 million, and \$185 million, respectively, of net periodic benefit costs from Operating and maintenance expense to Other income (expense), net on the consolidated statements of operations.

Financial Instruments

Description This guidance applies to the recognition and measurement of financial assets and liabilities. The standard requires all equity investments to be measured at fair value with changes in the fair value recognized through net income (other than those accounted for under the equity method of accounting or those that result in consolidation of the investee). The standard also amends presentation requirements related to certain changes in the fair value of a liability and eliminates certain disclosure requirements of significant assumptions for financial instruments measured at amortized cost on the balance sheet. Public entities must apply the amendments by means of a cumulative-effect adjustment to the balance sheet as of the beginning of the fiscal year of adoption.

Effective Date for TVA The new standard is effective for TVA's interim and annual reporting periods beginning October 1, 2018. Early adoption is not permitted unless specific early adoption guidance is applied. TVA does not currently plan to adopt the standard early.

Effect on the Financial Statements or Other Significant Matters TVA currently measures all of its equity investments (other than those that result in the consolidation of the investee) at fair value, with changes in the fair value recognized through net income. The TVA Board has authorized the use of regulatory accounting for changes in fair value of certain equity investments, and as a result, those changes in fair value are deferred as regulatory assets or liabilities. TVA currently discloses significant assumptions around its estimates of fair value for financial instruments carried at amortized cost on its consolidated balance sheet. TVA is currently evaluating the potential impact of the changes in this new guidance on its consolidated financial statements and related disclosures.

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Revenue Recognition

Description	<p>In 2014, the FASB issued new guidance related to revenue from contracts with customers. The guidance, including subsequent amendments, replaces the existing accounting standard and industry specific guidance for revenue recognition with a five-step model for recognizing and measuring revenue from contracts with customers. The underlying principle of the guidance is to recognize revenue to depict the transfer of goods or services to customers at the amount expected to be collected. The objective of the new standard is to provide a single, comprehensive revenue recognition model for all contracts with customers to improve comparability within industries and across industries. The new standard also requires enhanced disclosures regarding the nature, amount, timing, and uncertainty of revenue and the related cash flows arising from contracts with customers. At adoption, companies must also select a transition method to be applied either retrospectively to each prior reporting period presented or retrospectively with a cumulative effect adjustment to retained earnings at the date of initial adoption.</p>
Effective Date for TVA	<p>The new standard is effective for TVA's interim and annual reporting periods beginning October 1, 2018. While early adoption is permitted, TVA will not adopt the standard early.</p>
Effect on the Financial Statements or Other Significant Matters	<p>While TVA expects most of its revenue to be included in the scope of the new guidance, it has not completed its evaluation of all such arrangements. TVA's current efforts in evaluating the impact of the standard are focused on scoping of revenue streams and evaluating contracts with LPCs, which represent the majority of TVA's revenues. TVA is also conducting ongoing evaluations of how the new guidance impacts other transactions, including sales to directly served industrial customers, sales to federal agencies, purchase power agreements, fuel cost adjustments, and other revenue streams. In addition, the power and utilities industry is currently addressing certain industry-specific issues which have not yet been finalized. As the ultimate impact of the new standard has not yet been determined, TVA has not yet elected its transition method.</p>

Statement of Cash Flows

Description	<p>This guidance requires that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Therefore, amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. This guidance does not provide a definition of restricted cash or restricted cash equivalents.</p>
Effective Date for TVA	<p>The new standard is effective for TVA's interim and annual reporting periods beginning October 1, 2018. While early adoption is permitted, TVA does not currently plan to adopt the standard early.</p>
Effect on the Financial Statements or Other Significant Matters	<p>TVA does not expect the adoption of this standard to have a material impact on TVA's financial condition, results of operations, or cash flows.</p>

Derivatives and Hedging - Improvements to Accounting for Hedging Activities

Description	<p>This guidance better aligns an entity's risk management activities and financial reporting for hedging relationships through changes to both the designation and measurement guidance for qualifying hedging relationships and the presentation of hedge results. To meet that objective, the amendments expand and refine hedge accounting for both nonfinancial and financial risk components and align the recognition and presentation of the effects of the hedging instrument and the hedged item in the financial statements.</p>
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Effective Date The new standard is effective for TVA's interim and annual reporting periods beginning October 1, for TVA 2019. While early adoption is permitted, TVA does not currently plan to adopt the standard early.

Effect on the Financial

Statements or Other TVA does not expect the adoption of this standard to have a material impact on TVA's financial condition, results of operations, or cash flows.

Significant Matters

Lease Accounting

This guidance changes the provisions of recognition in both the lessee and lessor accounting models. The standard requires entities that lease assets — referred to as "lessees" — to recognize on the balance sheet the assets and liabilities for the rights and obligations created by leases with terms of more than 12 months. The recognition, measurement, and presentation of expenses and cash flows arising from a lease by a lessee primarily will depend on its classification as a finance (similar to current capital leases) or operating lease. However, unlike current lease accounting rules — which require only capital leases to be recognized on the balance sheet — the new standard will require both types of leases to be recognized on the balance sheet. Operating leases will result in straight-line expense, while finance leases will result in recognition of interest on the lease liability separate from amortization expense. The accounting for the owner of the assets leased by the lessee — also known as lessor accounting — will remain largely unchanged from current lease accounting rules. The standard allows for certain practical expedients to be elected related to lease term determination, separation of lease and non-lease elements, reassessment of existing leases, and short-term leases. When the standard becomes effective, it will include interim periods within that fiscal year and will be required to be applied using a modified retrospective transition.

Description

Effective Date The new standard is effective for TVA's interim and annual reporting periods beginning October 1, for TVA 2019. While early adoption is permitted, TVA does not currently plan to adopt the standard early.

Effect on the Financial Statements or Other Significant Matters TVA is currently evaluating the potential impact of these changes on its consolidated financial statements and related disclosures. TVA expects the new standard to impact financial position as adoption is expected to increase the amount of assets and liabilities recognized on TVA's consolidated balance sheets. TVA expects the new standard to have no material impact on results of operations or cash flows. TVA plans to elect certain of the practical expedients included in the new standard. TVA is also continuing to monitor unresolved industry implementation issues, including items related to renewables and purchased power agreements, easements, and rights-of-way, and will analyze the related impacts to lease accounting.



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## 3. Accounts Receivable, Net

Accounts receivable primarily consist of amounts due from customers for power sales. The table below summarizes the types and amounts of TVA's accounts receivable:

## Accounts Receivable, Net

At September 30

	2017	2016
Power receivables	\$1,441	\$1,637
Other receivables	129	111
Allowance for uncollectible accounts (1 ) (1 )		
Accounts receivable, net	\$1,569	\$1,747

## 4. Inventories, Net

The table below summarizes the types and amounts of TVA's inventories:

## Inventories, Net

At September 30

	2017	2016
Materials and supplies inventory	\$734	\$673
Fuel inventory	355	345
RECs/emission allowance inventory, net	15	14
Allowance for inventory obsolescence (39 ) (39 )		
Inventories, net	\$1,065	\$993

## 5. Net Completed Plant

Net completed plant consisted of the following:

## Net Completed Plant

At September 30

	2017			2016		
	Cost	Accumulated Depreciation	Net	Cost	Accumulated Depreciation	Net
Coal-fired	\$15,937	\$ 10,791	\$5,146	\$15,587	\$ 10,473	\$5,114
Gas and oil-fired	4,995	1,359	3,636	3,918	1,267	2,651
Nuclear	25,010	10,834	14,176	19,280	10,422	8,858
Transmission	7,264	3,039	4,225	7,061	2,975	4,086
Hydroelectric	3,015	967	2,048	2,891	932	1,959
Other electrical plant	1,756	1,008	748	1,857	1,126	731
	57,977	27,998	29,979	50,594	27,195	23,399
Multipurpose dams	928	387	541	928	379	549
Other stewardship	42	19	23	42	18	24
	970	406	564	970	397	573
Total	\$58,947	\$ 28,404	\$30,543	\$51,564	\$ 27,592	\$23,972

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## 6. Other Long-Term Assets

The table below summarizes the types and amounts of TVA's other long-term assets:

## Other Long-Term Assets

At September 30

	2017	2016
EnergyRight® receivables	\$100	\$112
Loans and other long-term receivables, net	115	136
Commodity contract derivative assets	2	3
Prepaid capacity payments	34	42
Other	72	93
Total other long-term assets	\$323	\$386

In association with the EnergyRight® Solutions program, LPCs offer financing to end-use customers for the purchase of energy-efficient equipment. Depending on the nature of the energy-efficiency project, loans may have a maximum term of five years or ten years. TVA purchases the resulting loans receivable from its LPCs. The loans receivable are then transferred to a third-party bank with which TVA has agreed to repay in full any loan receivable that has been in default for 180 days or more or that TVA has determined is uncollectible. Given this continuing involvement, TVA accounts for the transfer of the loans receivable as secured borrowings. The current and long-term portions of the loans receivable are reported in Accounts receivable, net and Other long-term assets, respectively, on TVA's consolidated balance sheets. As of September 30, 2017 and September 30, 2016, the carrying amount of the loans receivable, net of discount, reported in Accounts receivable, net was approximately \$25 million and \$29 million, respectively. See Note 11 for information regarding the associated financing obligation.

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## 7. Regulatory Assets and Liabilities

Regulatory assets generally represent incurred costs that have been deferred because such costs are probable of future recovery in customer rates. Regulatory liabilities generally represent obligations to make refunds to customers for previous collections for costs that are not likely to be incurred or deferral of gains that will be credited to customers in future periods. Components of regulatory assets and regulatory liabilities are summarized in the table below.

## Regulatory Assets and Liabilities

At September 30

	2017	2016
Current regulatory assets		
Deferred nuclear generating units	\$237	\$237
Unrealized losses on interest rate derivatives	93	—
Unrealized losses on commodity derivatives	68	122
Environmental agreements	2	34
Environmental cleanup costs – Kingston ash spill	44	42
Fuel cost adjustment receivable	1	98
Other current regulatory assets	2	3
Total current regulatory assets	447	536
Non-current regulatory assets		
Deferred pension costs and other post-retirement benefits costs	4,009	5,385
Unrealized losses on interest rate derivatives	982	1,547
Gallatin coal combustion residual facilities	899	—
Nuclear decommissioning costs	823	938
Environmental cleanup costs - Kingston ash spill	263	299
Non-nuclear decommissioning costs	703	819
Deferred nuclear generating units	759	850
Environmental agreements	13	18
Unrealized losses on commodity derivatives	9	56
Other non-current regulatory assets	238	252
Total non-current regulatory assets	8,698	10,164
Total regulatory assets	\$9,145	\$10,700
Current regulatory liabilities		
Fuel cost adjustment tax equivalents	\$153	\$148
Fuel cost adjustment	2	—
Unrealized gains on commodity derivatives	8	6
Total current regulatory liabilities	163	154
Non-current regulatory liabilities		
Deferred other post-retirement benefits cost	23	—
Unrealized gains on commodity derivatives	2	3
Total non-current regulatory liabilities	25	3
Total regulatory liabilities	\$188	\$157

Deferred Pension Costs and Other Post-retirement Benefit Costs. TVA measures its benefit obligations related to pension and other post-retirement benefit ("OPEB") costs at each year-end balance sheet date. TVA recognizes the funded status of the plans on TVA's consolidated balance sheets which in an unregulated environment would result in a corresponding offset to accumulated other comprehensive income (loss) ("AOCI"). "Incurred cost" is a cost arising

from cash paid out or an obligation to pay for an acquired asset or service, and a loss from any cause that has been sustained and for which payment has been or must be made. In the cases of pension and OPEB costs, the unfunded obligation represents a projected liability to the employee for services rendered, and thus it meets the definition of an incurred cost. Therefore, amounts that otherwise would be charged to AOCI for these costs are recorded as a regulatory asset or liability since TVA has historically recovered pension and OPEB expense in rates. Through historical and current year expense included in ratemaking, the TVA Board has demonstrated the ability and intent to include pension and OPEB costs in allowable costs and in rates for ratemaking

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purposes. As a result, it is probable that future revenue will result from inclusion of the pension and OPEB regulatory assets in allowable costs for ratemaking purposes.

These regulatory assets are classified as long-term, which is consistent with the pension and post-retirement liabilities, and are not amortized to the consolidated statements of operations over a specified recovery period. They are adjusted either upward or downward each year in conjunction with the adjustments to the unfunded pension liability, as calculated by the actuaries. Ultimately this regulatory asset will be recognized in the consolidated statements of operations in the form of pension expense as the actuarial liability is eliminated in future periods. See Note 20 — Obligations and Funded Status.

Additionally on October 1, 2014, TVA began recognizing pension costs as regulatory assets to the extent that the amount calculated under GAAP as pension expense differs from the amount TVA contributes to the pension plan.

**Unrealized Losses on Interest Rate Derivatives.** TVA uses regulatory accounting treatment to defer the unrealized gains and losses on certain interest rate derivative contracts. When amounts in these contracts are realized, the resulting gains or losses are included in the ratemaking formula. The unrealized losses on these interest rate derivatives are recorded on TVA's consolidated balance sheets as current and non-current regulatory assets, and the related realized gains or losses, if any, are recorded in TVA's consolidated statements of operations. Unrealized gains and losses on interest rate derivatives with a maturity of less than one year are included as a current regulatory asset or liability on TVA's consolidated balance sheets.

**Gallatin Coal Combustion Residual Facilities.** In August 2017, TVA began using regulatory accounting treatment to defer expected future costs related to Gallatin Fossil Plant ("Gallatin") coal combustion residuals ("CCR"). The TVA Board approved a plan to amortize these costs over the anticipated duration of the Gallatin CCR project (excluding post-closure care), beginning October 1, 2018 as amounts are included in rates or paid out. Accordingly, there are no amounts included as a current regulatory asset on TVA's consolidated balance sheets. See Note 8.

**Unrealized Gains (Losses) on Commodity Derivatives.** Unrealized gains (losses) on coal purchase contracts, included as part of unrealized gains (losses) on commodity derivatives, relate to the mark-to-market ("MtM") valuation of coal purchase contracts. These contracts qualify as derivative contracts but do not qualify for cash flow hedge accounting treatment. As a result, TVA recognizes the changes in the market value of these derivative contracts as a regulatory liability or asset. This treatment reflects TVA's ability and intent to recover the cost of these commodity contracts on a settlement basis for ratemaking purposes through the fuel cost adjustment. TVA recognizes the actual cost of fuel received under these contracts in fuel expense at the time the fuel is used to generate electricity. These contracts expire at various times through 2019. Unrealized gains and losses on contracts with a maturity of less than one year are included as a current regulatory asset or liability on TVA's consolidated balance sheets. See Note 15.

Deferred gains and losses relating to TVA's Financial Trading Program ("FTP") represent net unrealized gains and losses on swaps, which are also included as part of unrealized gains (losses) on commodity derivatives. Although currently suspended, the FTP was used to reduce TVA's economic risk exposure associated with purchases and sales of commodities used in electricity generation, purchases, and sales. TVA defers all FTP MtM unrealized gains or losses as regulatory liabilities or assets, respectively, and records realized gains or losses in fuel and purchased power expense to match the delivery period of the underlying commodity product. Net unrealized losses at September 30, 2017, and September 30, 2016, were approximately \$5 million and \$39 million, respectively. This accounting treatment reflects TVA's ability and intent to recover the cost of these commodity contracts in future periods through the fuel cost adjustment. The current regulatory asset/liability for net unrealized gains and losses, included as part of the commodity derivatives, represents deferred gains and losses from contracts with a maturity of less than one year.

Deferred Nuclear Generating Units. In November 2013, the TVA Board approved the treatment of all amounts currently included in Construction in progress related to Bellefonte Nuclear Plant ("Bellefonte") as a regulatory asset. Additionally, the TVA Board approved combining (1) the amounts related to Bellefonte previously included in Construction in progress, (2) the \$619 million in Regulatory asset-Construction costs, and (3) the remaining amounts included in Regulatory asset-Deferred nuclear generating units into a single regulatory asset titled Deferred nuclear generating units. Furthermore, in August 2016 the TVA Board approved the recognition of a regulatory asset for (1) all costs attributable to (a) the expected disposition of Bellefonte assets, including preparing or preserving the Bellefonte site, and (b) associated liabilities directly related to those assets, (2) any related future operating and project costs until the assets are sold, (3) the amount by which the book value of Bellefonte exceeds its fair market value less cost to sell, if any, (4) any subsequent gains and losses resulting from the disposition or impairment of Bellefonte, and (5) any costs attributable to the steam generators for Bellefonte until TVA disposes of the generators.

Deferred costs related to Bellefonte totaled \$1.0 billion at September 30, 2017. Such amounts have been classified as a Regulatory asset in the September 30, 2017 Consolidated Balance Sheet. The TVA Board approved the recovery of this asset in future rates at an amount of \$237 million per year until fully recovered. The amount to be amortized over the next year is included as a current regulatory asset on TVA's consolidated balance sheets.

On November 14, 2016, following a public auction, TVA entered into a contract to sell substantially all of the Bellefonte Nuclear Plant ("Bellefonte") site for \$111 million. The net book value of the Bellefonte assets to be sold and the related asset retirement costs are collectively \$121 million and are included in Regulatory asset — Deferred nuclear generating units on TVA's

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Consolidated Balance Sheet at September 30, 2017, as approved by the TVA Board. TVA received \$22 million on November 14, 2016, which is recorded as a long-term liability on TVA's Consolidated Balance Sheet at September 30, 2017, with the remaining \$89 million due at closing. The buyer has up to two years from November 14, 2016, to close on the property. The closing is subject to, among other conditions, a determination by TVA's Chief Executive Officer that potential environmental impacts have been appropriately addressed or are acceptable. Proceeds received from the sale will be recorded as a reduction to the regulatory asset upon closing and will reduce amounts collected in future rates.

Environmental Agreements. In conjunction with the Environmental Agreements (see Note 21 — Legal Proceedings — Environmental Agreements), TVA recorded certain liabilities totaling \$360 million (\$290 million investment in energy efficiency projects, demand response projects, renewable energy projects, and other TVA projects; \$60 million to be provided to Alabama, Kentucky, North Carolina, and Tennessee to fund environmental projects with preference for projects in the Tennessee River watershed; and \$10 million in civil penalties). The TVA Board determined that these costs would be collected in customer rates in the future, and, accordingly, the amounts were deferred as a regulatory asset. Through the end of 2017, \$275 million has been paid with respect to environmental projects, \$60 million has been paid to Alabama, Kentucky, North Carolina, and Tennessee, and \$10 million has been paid with respect to civil penalties. The remaining deferred amounts will be charged to expense and recovered in rates over future periods as payments are made through 2027.

Environmental Cleanup Costs – Kingston Ash Spill. In August 2009, TVA began using regulatory accounting treatment to defer all actual costs incurred and expected future costs related to the Kingston Fossil Plant ("Kingston") ash spill.

The TVA

Board approved a plan to amortize these costs over 15 years beginning October 1, 2009. Insurance proceeds are recorded as reductions to the regulatory asset and will reduce amounts collected in future rates. Amounts included as a current regulatory asset on TVA's consolidated balance sheets represent the amount to be amortized in the next 12 months.

Fuel Cost Adjustment Receivable. The fuel cost adjustment provides a mechanism to alter rates monthly to reflect changing fuel and purchased power costs, including realized gains and losses relating to transactions under TVA's FTP. There is typically a lag between the occurrence of a change in fuel and purchased power costs and the reflection of the change in fuel rates. Balances in the fuel cost adjustment regulatory accounts represent over-collected or under-collected revenues that offset fuel and purchased power costs, and the fuel rate is designed to recover or refund the balance in less than one year.

Nuclear Decommissioning Costs. Nuclear decommissioning costs include: (1) certain deferred charges related to the future closure and decommissioning of TVA's nuclear generating units under the NRC requirements, (2) recognition of changes in the liability, (3) recognition of changes in the value of TVA's NDT, and (4) certain other deferred charges under the accounting rules for AROs. These future costs will be funded through a combination of the NDT, future earnings on the NDT, and, if necessary, additional TVA cash contributions to the NDT and future earnings thereon. See Note 1 — Investment Funds. There is not a specified recovery period; therefore, the regulatory asset is classified as long-term consistent with the NDT investments and ARO liability.

Non-Nuclear Decommissioning Costs. Non-nuclear decommissioning costs include: (1) certain deferred charges related to the future closure and decommissioning of TVA's non-nuclear long-lived assets, (2) recognition of changes in the liability, (3) recognition of changes in the value of TVA's ART, and (4) certain other deferred charges under the accounting rules for AROs. TVA has established the ART to more effectively segregate, manage, and invest funds to help meet future non-nuclear AROs. The funds from the ART may be used, among other things, to pay the costs related to the future closure and retirement of non-nuclear long-lived assets under various legal requirements. These future costs can be funded through a combination of investment funds already set aside in the ART, future earnings on

those investment funds, and future cash contributions to the ART and future earnings thereon. For 2018, TVA will recover in rates a portion of its estimated current year non-nuclear decommissioning costs and contributions to the ART. Deferred charges will be recovered in rates based on an analysis of the expected expenditures, contributions, and investment earnings required to recover the decommissioning costs.

**Other Non-Current Regulatory Assets.** Other non-current regulatory assets consist of the following:

**Deferred Capital Leases and Other Financing Obligations.** Deferred capital lease and other financing asset costs represent the difference between the FERC's Uniform System of Accounts Prescribed for Public Utilities and Licensees Subject to the Provisions of the Federal Power Act ("Uniform System of Accounts") model balances and the balances under GAAP guidance. Under the Uniform System of Accounts, TVA recognizes the initial capital lease and other financing asset and liability at inception of the lease or other obligation; however, the annual expense under the Uniform System of Accounts is equal to the annual lease or other financing obligation payments, which differs from GAAP treatment. This practice results in TVA's asset balances being higher than they otherwise would have been under GAAP, with the difference representing a regulatory asset related to each capital lease or other financing obligation. These costs will be amortized over the respective lease or other financing obligation terms as lease or other financing obligation payments are made.

**Debt Reacquisition Costs.** Reacquisition expenses, call premiums, and other related costs, such as unamortized debt issue costs associated with redeemed Bond issues, are deferred and amortized (accrued) on a straight-line basis over the weighted average life of TVA's debt portfolio.



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**Nuclear Training Costs.** As a result of refurbishing and restarting Browns Ferry Unit 1 in 2007 and the construction and startup of Watts Bar Unit 2, nuclear training costs associated with these units have been deferred as a regulatory asset and will be amortized over a cost recovery period equivalent to the expected useful life of the operating nuclear units.

**Retirement Removal Costs.** Retirement removal costs, net of salvage, that are not legally required are recognized as a regulatory asset. Prior to 2017, net removal costs were amortized over a recovery period consistent with the depreciable lives of related assets under the most recent depreciation study. In 2017 and thereafter, net removal costs are amortized over a one-year period subsequent to completion of the removal activities.

**Fuel Cost Adjustment Tax Equivalents.** The fuel cost adjustment includes a provision related to the current funding of the future payments TVA will make. As TVA records the fuel cost adjustment, the percent of the calculation that relates to a future asset or liability for tax equivalent payments is recorded as a current regulatory asset or liability and paid or refunded in the following year.

**Accelerated Amortization of Certain Regulatory Assets.** In August 2017, the TVA Board authorized management to accelerate amortization of certain regulatory assets to the extent that actual net income in 2018 exceeds the budgeted amount, up to the aggregate amount of those certain regulatory assets. Assets included in this Board action include: deferred nuclear generating units, environmental cleanup costs related to the Kingston ash spill, and nuclear training costs related to the refurbishing and restarting of Browns Ferry Unit 1 and the construction and startup of Watts Bar Unit 2. The amount of additional amortization expense, if any, will be determined at the end of the year upon calculation of the excess (if any) and recorded as an adjustment as of the end of the year.

## 8. Gallatin Coal Combustion Residual Facilities

### Background

TVA is planning to close wet CCR impoundments in accordance with federal and applicable state requirements when (1) coal-fired plants are converted to dry CCR processes and dry storage landfills become operational or (2) plant operations cease. Closure project schedules and costs are driven by the selected closure technology. The impoundments at Gallatin are pending additional studies to determine the final closure methodology and schedule. While plans are currently being formulated for the CCR closure methodology for Gallatin, TVA is involved in two lawsuits relating to alleged discharges of pollutants from the CCR facilities at Gallatin.

**Lawsuit Brought by TDEC.** In January 2015, the Tennessee Department of Environment and Conservation ("TDEC") filed a lawsuit against TVA in the Chancery Court for Davidson County, Tennessee. The lawsuit alleges that pollutants have been discharged into waters of the State from CCR facilities at Gallatin in violation of the Tennessee Water Quality Control Act and the Tennessee Solid Waste Disposal Act. TDEC seeks injunctive relief, which could include an order requiring TVA to relocate the CCR facilities. TDEC also requested civil penalties of up to \$17,000 per day for each day TVA is found to have violated the statutes. In February 2015, the court issued an order allowing Tennessee Scenic Rivers Association ("TSRA") and Tennessee Clean Water Network ("TCWN") to intervene in the case, and in January 2016, the court ordered TVA, among other things, to develop and submit to TDEC an environmental investigation plan and an environmental assessment report (the "January 2016 Order"). On August 4, 2017, TDEC filed an amended complaint adding new facts, claims, and causes of action. Consequently, on August 10, 2017, TVA removed the case from state court to federal court. The case is now in the United States District Court for the Middle District of Tennessee. The plaintiffs have filed motions requesting that the case be remanded to state court. Briefing on the motions is expected to be completed in November 2017.

Lawsuit Brought by TSRA and TCWN. In April 2015, TSRA and the TCWN filed a lawsuit against TVA in the United States District Court for the Middle District of Tennessee alleging that pollutants have been discharged into the Cumberland River from CCR facilities at Gallatin in violation of the Clean Water Act (“CWA”). The plaintiffs are seeking injunctive relief, including an order requiring TVA to relocate the CCR facilities, civil penalties of up to \$37,500 per violation per day, and attorneys’ fees.

Trial in this action began on January 30, 2017, and concluded February 2, 2017. On August 4, 2017, the court issued a decision largely in favor of the plaintiffs (the “August 2017 Order”), finding that TVA had discharged pollutants into the Cumberland River in the past and that the discharge was likely ongoing. The court ordered TVA to excavate the CCR materials and move them to a lined facility. The court further required TVA to file within 30 days a draft timetable for excavating and removing the material. The court did not assess any monetary penalties against TVA for the CWA violations, citing the fact that its order to relocate the CCR material would cause TVA to incur significant costs.

On September 5, 2017, TVA submitted the required draft timetable, which assumes that a new lined facility can be permitted and built on the Gallatin site. The process of obtaining the necessary permits, constructing the facility, and moving all of the CCR materials is estimated to take approximately 24 years. Under current regulations, TVA would be required to monitor the existing facilities and the new facility for thirty years after closure. The estimated cost of the potential Gallatin CCR project is approximately \$900 million. At September 30, 2017, related liabilities of \$880 million and \$19 million were recorded in Other long-term liabilities and Accounts payable and accrued liabilities, respectively. Prior to the court’s decision, TVA had anticipated

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spending approximately \$200 million to cap and close the existing CCR facilities. On October 2, 2017, TVA appealed the court's decision to the United States Court of Appeals for the Sixth Circuit ("Sixth Circuit").

### Financial Impact

In August 2017, TVA began using regulatory accounting treatment to defer expected future costs of compliance with orders or settlements related to lawsuits involving the Gallatin CCR facilities. The TVA Board approved a plan to amortize these costs over the anticipated duration of the Gallatin CCR project (excluding post-closure care), beginning October 1, 2018 as amounts are included in rates or paid out. TVA has estimated these costs to be approximately \$900 million. These costs include, among other things, environmental studies concerning the existing and new facilities, the licensing activities for the new facility, design and construction of the new facility, relocating the material from the existing facilities to the new facility, closing the existing facilities, monitoring activities, and an amount of additional costs reflecting the expected impacts of inflation given the anticipated duration of the project. The costs do not include such items as any additional order or penalty arising from the TDEC lawsuit, which cannot be reasonably estimated at this time. TVA has not discounted this environmental obligation to a present value amount. TVA also committed in its draft timetable to complete capital projects related to construction of a permanent bottom ash dewatering facility and wastewater process ponds. These capital projects, which are not included in the estimate for cleanup costs above, are estimated to cost approximately \$91 million and be completed over 3 years.

It is reasonably possible that TVA will not be able to obtain the necessary permits to build the facility on the Gallatin site and will be required to move the CCR materials offsite. Offsite relocation would materially increase both the cost and the time to comply with the August 2017 Order. TVA has estimated that if it is required to relocate the materials to a facility off the Gallatin site, TVA may incur up to \$2.0 billion in expenses, plus an amount of additional costs reflecting the expected impacts of inflation given the extended duration of an offsite relocation project. The process of obtaining the necessary permits for offsite disposal, locating or constructing an offsite facility, and moving all of the CCR materials offsite is estimated to take approximately 40 years. TVA would also be required to monitor the existing facilities and the offsite facility for 30 years after the facilities are closed, based on current regulations.

The ultimate cost of the removal project will depend on actual timing and results of ongoing litigation, environmental studies, licensing, permitting, site subsurface conditions, contractor availability, weather, equipment, available material resources, and other contingency factors. These contingency factors could cause the project cost estimate to change materially in the near term. TVA updates its estimate for project costs as changes in these factors are determined to be probable of occurring.

## 9. Asset Acquisitions and Business Combinations

### Asset Acquisition

On September 20, 2017, TVA acquired 100 percent of the equity interests in two SPEs designed to administer rent payments TVA makes under certain of its lease/leaseback arrangements. Each entity holds residual interests in four of TVA's peaking combustion turbine units ("CTs"). TVA acquired these entities in order to reacquire the residual interests in eight CTs it had previously granted in the lease/leaseback arrangements.

TVA acquired the entities for total cash consideration of \$36 million. The fair value of the assets acquired consisted of \$110 million of reacquired rights, and the fair value of liabilities assumed consisted of \$74 million in notes payable. Reacquired rights are an intangible asset included in TVA's Completed plant balance and are amortized over the estimated useful life of the underlying CTs. Notes payable assumed in the transaction are included in TVA's Long-term debt and require TVA to make semi-annual payments through May 2020. TVA recognized less than \$1 million of amortization expense, related to reacquired rights, within TVA's consolidated statements of

operations. Transaction costs were not material.

TVA determined that its lease/leaseback obligations were preexisting relationships that were effectively settled in the asset acquisitions. TVA settled the preexisting relationships separately from the asset acquisitions, resulting in a loss on extinguishment of the obligations of \$3 million. The carrying value of lease/leaseback obligations effectively settled was \$71 million, including accrued interest, and the reacquisition price was \$74 million, paid in cash, at the acquisition date.

#### Business Combination

On July 20, 2016, TVA acquired 100 percent of the equity interests in Johnsonville Generation, LLC and Gallatin Generation, LLC, two special purpose entities ("SPEs") designed to administer rent payments TVA makes under certain of its lease/leaseback arrangements. The SPEs also each hold residual interests in four of TVA's peaking combustion turbine units. TVA acquired these businesses in order to exercise its rights of first refusal under certain of its lease/leaseback arrangements and to reacquire the residual interests in eight combustion turbine units it had previously granted in the lease/leaseback arrangements.

TVA acquired the entities for total cash consideration of \$33 million. The fair value of the assets acquired consisted of \$111 million of reacquired rights, and the fair value of liabilities assumed consisted of \$78 million in notes payable.  
Reacquired

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rights are an intangible asset included in TVA's completed plant balance and are amortized over the estimated useful life of the underlying combustion turbine units. Notes payable assumed in the transaction are included in TVA's long-term debt and are subject to semi-annual payments through March 2019. The entities acquired by TVA had \$1 million of amortization expense, related to reacquired rights, and this expense is included within TVA's consolidated statements of operations. Transaction costs were expensed as incurred and were not material.

TVA determined that its lease/leaseback obligations were preexisting relationships that were effectively settled in the business combinations. TVA settled the preexisting relationships separately from the business combinations, resulting in a loss on extinguishment of the obligations of \$6 million. The carrying value of lease/leaseback obligations effectively settled was \$72 million, including accrued interest, and the reacquisition price was \$78 million, paid in cash, at the acquisition date.

10. Variable Interest Entities

A VIE is an entity that either (i) has insufficient equity to permit the entity to finance its activities without additional subordinated financial support or (ii) has equity investors who lack the characteristics of owning a controlling financial interest. When TVA determines that it has a variable interest in a VIE, a qualitative evaluation is performed to assess which interest holders have the power to direct the activities that most significantly impact the economic performance of the entity and have the obligation to absorb losses or receive benefits that could be significant to the entity. The evaluation considers the purpose and design of the business, the risks that the business was designed to create and pass along to other entities, the activities of the business that can be directed and which party can direct them, and the expected relative impact of those activities on the economic performance of the business through its life. TVA has the power to direct the activities of an entity when it has the ability to make key operating and financing decisions, including, but not limited to, capital investment and the issuance of debt. Based on the evaluation of these criteria, TVA has determined it is the primary beneficiary of certain entities and as such is required to account for the VIEs on a consolidated basis.

John Sevier VIEs

In 2012, TVA entered into a \$1.0 billion construction management agreement and lease financing arrangement with John Sevier Combined Cycle Generation LLC ("JSCCG") for the completion and lease by TVA of the John Sevier Combined Cycle Facility ("John Sevier CCF"). JSCCG is a special single-purpose limited liability company formed in January 2012 to finance the John Sevier CCF through a \$900 million secured note issuance (the "JSCCG notes") and the issuance of \$100 million of membership interests subject to mandatory redemption. The membership interests were purchased by John Sevier Holdco LLC ("Holdco"). Holdco is a special single-purpose entity, also formed in January 2012, established to acquire and hold the membership interests in JSCCG. A non-controlling interest in Holdco is held by a third party through nominal membership interests, to which none of the income, expenses, and cash flows are allocated.

The membership interests held by Holdco in JSCCG were purchased with proceeds from the issuance of \$100 million of secured notes (the "Holdco notes") and are subject to mandatory redemption pursuant to a schedule of amortizing, semi-annual payments due each January 15 and July 15, with a final payment due in January 2042. The payment dates for the mandatorily redeemable membership interests are the same as those of the Holdco notes. The sale of the JSCCG notes, the membership interests in JSCCG, and the Holdco notes closed in January 2012. The JSCCG notes are secured by TVA's lease payments, and the Holdco notes are secured by Holdco's investment in, and amounts receivable from, JSCCG. TVA's lease payments to JSCCG are equal to and payable on the same dates as JSCCG's and Holdco's semi-annual debt service payments. In addition to the lease payments, TVA pays administrative and miscellaneous expenses incurred by JSCCG and Holdco. Certain agreements related to this transaction contain default and acceleration provisions.

Due to its participation in the design, business conduct, and credit and financial support of JSCCG and Holdco, TVA has determined that it has a variable interest in each of these entities. Based on its analysis, TVA has concluded that it is the primary beneficiary of JSCCG and Holdco and, as such, is required to account for the VIEs on a consolidated basis. Holdco's membership interests in JSCCG are eliminated in consolidation.

#### Southaven VIE

In 2013, TVA entered into a \$400 million lease financing arrangement with Southaven Combined Cycle Generation LLC ("SCCG") for the lease by TVA of the Southaven Combined Cycle Facility ("Southaven CCF"). SCCG is a special single-purpose limited liability company formed in June 2013 to finance the Southaven CCF through a \$360 million secured notes issuance (the "SCCG notes") and the issuance of \$40 million of membership interests subject to mandatory redemption. The membership interests were purchased by Southaven Holdco LLC ("SHLLC"). SHLLC is a special single-purpose entity, also formed in June 2013, established to acquire and hold the membership interests in SCCG. A non-controlling interest in SHLLC is held by a third party through nominal membership interests, to which none of the income, expenses, and cash flows of SHLLC are allocated.

The membership interests held by SHLLC were purchased with proceeds from the issuance of \$40 million of secured notes (the "SHLLC notes") and are subject to mandatory redemption pursuant to a schedule of amortizing, semi-annual payments due each February 15 and August 15, with a final payment due on August 15, 2033. The payment dates for the mandatorily redeemable membership interests are the same as those of the SHLLC notes, and the payment amounts are

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sufficient to provide returns on, as well as returns of, capital until the investment has been repaid to SHLLC in full. The rate of return on investment to SHLLC is 7.0 percent, which is reflected as interest expense in the consolidated statements of operations. SHLLC is required to pay a pre-determined portion of the return on investment to Seven States Southaven, LLC ("SSSL") on each lease payment date as agreed in SHLLC's formation documents (the "Seven States Return"). The current and long-term portions of the Membership interests of VIE subject to mandatory redemption are included in Accounts payable and accrued liabilities and Other long-term liabilities, respectively.

The payment dates for the mandatorily redeemable membership interests are the same as those of the SHLLC notes. The SCCG notes are secured by TVA's lease payments, and the SHLLC notes are secured by SHLLC's investment in, and amounts receivable from, SCCG. TVA's lease payments to SCCG are payable on the same dates as SCCG's and SHLLC's semi-annual debt service payments and are equal to the sum of (i) the amount of SCCG's semi-annual debt service payments, (ii) the amount of SHLLC's semi-annual debt service payments, and (iii) the amount of the Seven States Return. In addition to the lease payments, TVA pays administrative and miscellaneous expenses incurred by SCCG and SHLLC. Certain agreements related to this transaction contain default and acceleration provisions.

In the event that TVA were to choose to exercise an early buy out feature of the Southaven facility lease, in part or in whole, TVA must pay to SCCG amounts sufficient for SCCG to repay or partially repay on a pro rata basis the membership interests held by SHLLC, including any outstanding investment amount plus accrued but unpaid return. TVA also has the right, at any time and without any early redemption of the other portions of the Southaven facility lease payments due to SCCG, to fully repay SHLLC's investment, upon which repayment SHLLC will transfer the membership interests to a designee of TVA.

TVA participated in the design, business conduct, and financial support of SCCG and has determined that it has a direct variable interest in SCCG resulting from risk associated with the value of the Southaven CCF at the end of the lease term. Based on its analysis, TVA has determined that it is the primary beneficiary of SCCG and, as such, is required to account for the VIE on a consolidated basis.

## Impact on Consolidated Financial Statements

The financial statement items attributable to carrying amounts and classifications of JSCCG, Holdco, and SCCG as of September 30, 2017 and 2016, as reflected in the Consolidated Balance Sheets, are as follows:

## Summary of Impact of VIEs on Consolidated Balance Sheets

At September 30

	2017	2016
Current liabilities		
Accrued interest	\$ 11	\$ 11
Accounts payable and accrued liabilities	2	2
Current maturities of long-term debt of variable interest entities	36	35
Total current liabilities	49	48
Other liabilities		
Other long-term liabilities	30	33
Long-term debt, net		
Long-term debt of variable interest entities, net	1,164	1,199
Total liabilities	\$ 1,243	\$ 1,280

Interest expense of \$59 million, \$61 million, and \$63 million related to debt of VIEs and membership interests of variable interest entity subject to mandatory redemption is included in the Consolidated Statements of Operations for the years ended September 30, 2017, 2016, and 2015, respectively.

Creditors of the VIEs do not have any recourse to the general credit of TVA. TVA does not have any obligations to provide financial support to the VIEs other than as prescribed in the terms of the agreements related to these transactions.



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## 11. Other Long-Term Liabilities

Other long-term liabilities consist primarily of liabilities related to certain derivative agreements as well as liabilities for environmental remediation liabilities, and liabilities under agreements related to compliance with certain environmental regulations. See Note 8 and Note 21 — Legal Proceedings — Environmental Agreements. The table below summarizes the types and amounts of Other long-term liabilities:

Other Long-Term Liabilities  
At September 30

	2017	2016
Interest rate swap liabilities	\$1,418	\$1,938
Gallatin coal combustion residual facilities liability	880	—
Capital lease obligations	182	177
Currency swap liabilities	92	162
EnergyRight® financing obligation	115	130
Environmental agreements liability	13	18
Membership interests of VIE subject to mandatory redemption	30	33
Commodity contract derivative liabilities	9	49
Other	316	266
Total other long-term liabilities	\$3,055	\$2,773

EnergyRight® Financing Obligation. TVA purchases certain loans receivable from its LPCs in association with the EnergyRight® Solutions program. The current and long-term portions of the resulting financing obligation are reported in Accounts payable and accrued liabilities and Other long-term liabilities, respectively, on TVA's consolidated balance sheets. As of September 30, 2017 and 2016, the carrying amount of the financing obligation reported in Accounts payable and accrued liabilities was approximately \$29 million and \$33 million, respectively. See Note 6 for information regarding the associated loans receivable.

## 12. Asset Retirement Obligations

During the year ended September 30, 2017, TVA's total ARO liability increased \$252 million.

To estimate its decommissioning obligation related to its nuclear generating stations, TVA uses a probability-weighted, discounted cash flow model which, on a unit-by-unit basis, considers multiple outcome scenarios that include significant estimations and assumptions. Those assumptions include (1) estimates of the cost of decommissioning, (2) the method of decommissioning and the timing of the related cash flows, (3) the license period of the nuclear plant, considering the probability of license extensions, (4) cost escalation factors, and (5) the credit adjusted risk free rate to measure the obligation at the present value of the future estimated costs. TVA has ascribed probabilities to two different decommissioning methods related to its nuclear decommissioning obligation estimate: the DECON method and the SAFSTOR method. The DECON method requires radioactive contamination to be removed from a site and safely disposed of or decontaminated to a level that permits the site to be released for unrestricted use shortly after it ceases operation. The SAFSTOR method allows nuclear facilities to be placed and maintained in a condition that allows the facilities to be safely stored and subsequently decontaminated to levels that permit release for unrestricted use.

TVA bases its nuclear decommissioning estimates on site-specific cost studies. The most recent study was approved and implemented in September 2017. An increase of \$250 million was recorded to the nuclear AROs as a result of the updates. Site-specific cost studies are updated for each of TVA's nuclear units at least every five years.

On May 23, 2016, Watts Bar Unit 2 achieved initial criticality. As a result, TVA revised its decommissioning liability estimate for Watts Bar and recorded an increase of \$198 million.

During 2017, TVA recorded adjustments to non-nuclear ARO liabilities as a result of projects maturing and estimates being refined. This resulted in an increase of \$161 million to the non-nuclear AROs. This amount was offset by a decrease of \$188 million to non-nuclear AROs due to the reversal of certain Gallatin AROs given that the retirement obligations for the Gallatin ash ponds are now recorded as part of environmental remediation obligations. See Note 8.

During 2016, TVA performed reassessments of its AROs for its non-nuclear plants and other buildings. The reassessments consisted of detailed studies of various TVA sites conducted to identify and update benchmarks and standards used in estimating decommissioning costs. Additionally, TVA management updated its non-nuclear plant closure method assumption from a maintain-in-place method to a plant demolition method. TVA's reassessments and change in its closure

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method assumption resulted in a net increase of \$32 million to TVA's liability for existing non-nuclear AROs during the year ended September 30, 2016. Also during 2016, TVA recorded a decrease of \$54 million to its non-nuclear AROs as a result of changes in estimates related to active decommissioning projects and recorded \$15 million of new AROs related to coal ash areas. Further adjustments to TVA's non-nuclear ARO liabilities may be required as projects mature and estimates are refined.

Additionally, during the years ended September 30, 2017 and 2016, both the nuclear and non-nuclear liabilities were increased by periodic accretion, partially offset by settlement projects that were conducted during these periods. The nuclear and non-nuclear accretion amounts were deferred as regulatory assets. During 2017, 2016, and 2015, \$144 million, \$144 million, and \$44 million, respectively, of the related regulatory assets were amortized into expense as these amounts were collected in rates. See Note 7. TVA maintains investment trusts to help fund its decommissioning obligations. See Note 16 and Note 21 — Contingencies — Decommissioning Costs for a discussion of the trusts' objectives and the current balances of the trusts.

## Asset Retirement Obligation Activity

	Nuclear	Non-Nuclear	Total
Balance at September 30, 2015	\$ 2,187	\$ 1,656	\$ 3,843
Settlements	—	(133 )	(133 )
Change in estimate	198	(22 )	176
Additional obligations	—	15	15
Accretion (recorded to regulatory asset)	107	44	151
Balance at September 30, 2016	\$ 2,492	\$ 1,560	\$ 4,052 <sup>(1)</sup>
Settlements	—	(123 )	(123 )
Change in estimate	250	161	411
Additional obligations	—	1	1
Reclassification of Gallatin projects <sup>(2)</sup>	—	(188 )	(188 )
Accretion (recorded to regulatory asset)	117	34	151
Balance at September 30, 2017	\$ 2,859	\$ 1,445	\$ 4,304 <sup>(1)</sup>

## Notes

(1) The current portions of the ARO liability in the amounts of \$128 million and \$212 million as of September 30, 2017 and 2016, respectively, are included in Accounts payable and accrued liabilities.

(2) See Note 8 for additional information.

## 13. Debt and Other Obligations

## General

The TVA Act authorizes TVA to issue Bonds in an amount not to exceed \$30.0 billion at any time. At September 30, 2017, TVA had only two types of Bonds outstanding: power bonds and discount notes. Power bonds have maturities between one and 50 years, and discount notes have maturities of less than one year. Power bonds and discount notes are both issued pursuant to Section 15d of the TVA Act and pursuant to the Basic Tennessee Valley Authority Power Bond Resolution adopted by the TVA Board on October 6, 1960, as amended on September 28, 1976, October 17, 1989, and March 25, 1992 (the "Basic Resolution"). Bonds are not obligations of the United States, and the United States does not guarantee the payments of principal or interest on Bonds.

Power bonds and discount notes rank on parity and have first priority of payment from net power proceeds, which are defined as the remainder of TVA's gross power revenues after deducting the costs of operating, maintaining, and administering its power properties and tax equivalent payments, but before deducting depreciation accruals or other charges representing the amortization of capital expenditures, plus the net proceeds from the sale or other disposition of any power facility or interest therein.

TVA considers its scheduled rent payments under its leaseback transactions, as well as its scheduled payments under its lease financing arrangements involving John Sevier CCF and Southaven CCF, as costs of operating, maintaining, and administering its power properties. Costs of operating, maintaining, and administering TVA's power properties have priority over TVA's payments on the Bonds. Once net power proceeds have been applied to payments on power bonds and discount notes as well as any other Bonds that TVA may issue in the future that rank on parity with or subordinate to power bonds and discount notes, Section 2.3 of the Basic Resolution provides that the remaining net power proceeds shall be used only for (1) minimum payments into the U.S. Treasury required by the TVA Act as repayment of, and as a return on, the Power Program Appropriation Investment, (2) investment in power assets, (3) additional reductions of TVA's capital obligations, and (4) other lawful purposes related to TVA's power program.

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The TVA Act and the Basic Resolution each contain two bond tests: the rate test and the bondholder protection test. Under the rate test, TVA must charge rates for power which will produce gross revenues sufficient to provide funds for, among other things, debt service on outstanding Bonds. As of September 30, 2017, TVA was in compliance with the rate test. See Note 1 — General. Under the bondholder protection test, TVA must, in successive five-year periods, use an amount of net power proceeds at least equal to the sum of (1) the depreciation accruals and other charges representing the amortization of capital expenditures and (2) the net proceeds from any disposition of power facilities for either the reduction of its capital obligations (including Bonds and the Power Program Appropriation Investment) or investment in power assets. TVA met the bondholder protection test for the five-year period ended September 30, 2015, and must next meet the bondholder protection test for the five-year period ending September 30, 2020.

### Secured Debt of VIEs

On August 9, 2013, SCCG issued secured notes totaling \$360 million that bear interest at a rate of 3.846 percent. The SCCG notes require amortizing semi-annual payments on each February 15 and August 15, and mature on August 15, 2033. Also on August 9, 2013, SCCG issued \$40 million of membership interests subject to mandatory redemption. The proceeds from the secured notes issuance and the issuance of the membership interests was paid to TVA in accordance with the terms of the Southaven head lease. See Note 10 — Southaven VIE. TVA used the proceeds from the transaction primarily to fund the acquisition of the Southaven CCF from SSSL.

On January 17, 2012, JSCCG issued secured notes totaling \$900 million in aggregate principal amount that bear interest at a rate of 4.626 percent. Also on January 17, 2012, Holdco issued secured notes totaling \$100 million that bear interest at a rate of 7.1 percent. The JSCCG notes and the Holdco notes require amortizing semi-annual payments on each January 15 and July 15, and mature on January 15, 2042. The Holdco notes require a \$10 million balloon payment upon maturity. See Note 10 — John Sevier VIEs. TVA used the proceeds from the transaction to meet its requirements under the TVA Act. Secured debt of VIEs, including current maturities, outstanding at September 30, 2017 and 2016 totaled approximately \$1.2 billion each year.

### Secured Notes

On July 20, 2016, TVA acquired two entities, in a business combination, designed to administer rent payments TVA makes under certain of its lease/leaseback arrangements. See Note 9. On September 27, 2000, the entities issued secured notes totaling \$255 million that had an interest rate of 7.299 percent and required amortizing semi-annual payments on each March 15 and September 15 with a maturity date of March 15, 2019. In 2016, TVA assumed these secured notes in the acquisition at a fair value of \$78 million. The secured notes of the entities, including current maturities, outstanding at September 30, 2017, and 2016, totaled approximately \$48 million and \$75 million, respectively, and are included in Notes payable in TVA's consolidated balance sheets.

On September 20, 2017, TVA acquired two entities, in an asset acquisition, designed to administer rent payments TVA makes under certain of its lease/leaseback arrangements. On November 14, 2001, the entities issued secured notes totaling \$272 million that had an interest rate of 5.572 percent and required amortizing semi-annual payments on each May 1 and November 1 with a maturity date of May 1, 2020. In 2017, TVA assumed these secured notes in the acquisition at a fair value of \$74 million. The secured notes of the entities, including current maturities, outstanding at September 30, 2017, totaled approximately \$74 million, and are included in Notes payable in TVA's consolidated balance sheets. See Note 9.

### Short-Term Debt

The following table provides information regarding TVA's short-term borrowings:

Short-term Borrowings  
At September 30

	2017	2016	2015
Amount outstanding - discount notes	\$1,998	\$1,407	\$1,034
Weighted average interest rate - discount notes	1.000 %	0.203 %	0.055 %

Put and Call Options

Bond issues of \$408 million held by the public are redeemable in whole or in part, at TVA's option, on call dates ranging from the present to 2020 and at call prices of 100 percent the principal amount. Ten Bond issues totaling \$268 million, with maturity dates ranging from 2025 to 2043, include a "survivor's option," which allows for right of redemption upon the death of a beneficial owner in certain specified circumstances. The amount of these Bonds classified as short-term was \$46 million, with the remaining balance of \$222 million classified as long-term, as of September 30, 2017. These bonds were classified as long-term as of September 30, 2016.

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Additionally, TVA has two issues of PARRS outstanding. After a fixed-rate period of five years, the coupon rate on the PARRS may automatically be reset downward under certain market conditions on an annual basis. The coupon rate reset on the PARRS is based on a calculation. For both series of PARRS, the coupon rate will reset downward on the reset date if the rate calculated is below the then-current coupon rate on the Bond. The calculation dates, potential reset dates, and terms of the calculation are different for each series. The coupon rate on the 1998 Series D PARRS may be reset on June 1 (annually) if the sum of the five-day average of the 30-Year Constant Maturity Treasury ("CMT") rate for the week ending the last Friday in April, plus 94 basis points, is below the then-current coupon rate. The coupon rate on the 1999 Series A PARRS may be reset on May 1 (annually) if the sum of the five-day average of the 30-Year CMT rate for the week ending the last Friday in March, plus 84 basis points, is below the then-current coupon rate. The coupon rates may only be reset downward, but investors may request to redeem their Bonds at par value in conjunction with a coupon rate reset for a limited period of time prior to the reset dates under certain circumstances.

The coupon rate for the 1998 Series D PARRS, which mature in June 2028, has been reset seven times, from an initial rate of 6.750 percent to the current rate of 3.550 percent. In connection with these resets, \$301 million of the Bonds have been redeemed, so \$274 million of the Bonds were outstanding at September 30, 2017. The coupon rate for the 1999 Series A PARRS, which mature in May 2029, has been reset six times, from an initial rate of 6.50 percent to the current rate of 3.360 percent. In connection with these resets, \$293 million of the Bonds have been redeemed, so \$232 million of the Bonds were outstanding at September 30, 2017.

Due to the contingent nature of the put option on the PARRS, TVA determines whether the PARRS should be classified as long-term debt or current maturities of long-term debt by calculating the expected reset rate for the Bonds on the calculation dates, described above. If the expected reset rate is less than the then-current coupon rate on the PARRS, the PARRS are included in current maturities. Otherwise, the PARRS are included in long-term debt.

## Debt Securities Activity

The table below summarizes the long-term debt securities activity for the period from October 1, 2015, to September 30, 2017.

## Debt Securities Activity

For the years ended September 30

	2017	2016
Issues		
2017 Series A <sup>(1)</sup>	\$1,000	\$—
Discount on debt issues	(1 )	—
Total	\$999	\$—
Acquisitions		
Notes payable <sup>(2)</sup>	\$74	\$78
Redemptions/Maturities <sup>(3)</sup>		
Variable interest entities	\$35	\$33
Notes payable	27	3
electronotes <sup>®</sup>	5	47
2009 Series A	—	2
2009 Series B	28	27
2001 Series D	525	—
2007 Series A	1,000	—
Total	\$1,620	\$112

Notes

(1) The 2017 Series A bonds were issued at 99.9 percent of par.

(2) The related leaseback obligations of \$70 million previously reported in Other liabilities in TVA's consolidated balance sheets were extinguished in the fourth quarters of both 2017 and 2016 as a result of each year's acquisition. See Note 9 for additional information.

(3) All redemptions were at 100 percent of par.



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## Debt Outstanding

Total debt outstanding at September 30, 2017, and 2016, consisted of the following:

## Short-Term Debt

At September 30

CUSIP or Other Identifier	Maturity	Call/(Put) Date	Coupon Rate	2017	2016
Short-term debt, net of discounts				\$1,998	\$1,407
Current maturities of long-term debt of variable interest entities issued at par				36	35
Current maturities of notes payable				53	27
Current maturities of power bonds issued at par					
880591EF5	12/15/2017		3.770%	1	1
880591EF5	6/15/2018		3.770%	28	27
88059TEL1	11/15/2017		2.650%	1	1
88059TEL1	5/15/2018		2.650%	2	2
880591DS8	12/15/2016		4.875%	—	524
880591EA6	7/18/2017		5.500%	—	1,000
880591CU4	12/15/2017		6.250%	650	—
880591EC2	4/1/2018		4.500%	1,000	—
88059TFS5	10/15/2017		4.125%	46	—
Total current maturities of power bonds issued at par				1,728	1,555
Total current debt outstanding, net				\$3,815	\$3,024

Table of ContentsLong-Term Debt<sup>(1)</sup>

At September 30

CUSIP or Other Identifier	Maturity	Coupon Rate	Call Date	2017 Par	2016 Par	Stock Exchange Listings
electronotes <sup>®(2)</sup>	5/15/2020 - 2/15/2043	2.375% - 3.625%	2/15/2015 - 2/15/2018	\$226	\$278	None
880591CU4	12/15/2017	6.250%		—	650	New York
880591EC2	4/1/2018	4.500%		—	1,000	New York, Luxembourg
880591EQ1	10/15/2018	1.750%		1,000	1,000	New York
880591EL2	2/15/2021	3.875%		1,500	1,500	New York
880591DC3	6/7/2021	5.805% <sup>(3)</sup>		268	260	New York, Luxembourg
880591EN8	8/15/2022	1.875%		1,000	1,000	New York
880591ER9	9/15/2024	2.875%		1,000	1,000	New York
880591CJ9	11/1/2025	6.750%		1,350	1,350	New York, Hong Kong, Luxembourg, Singapore
880591EU26	2/1/2027	2.875%		1,000	—	New York
880591300 <sup>(4)</sup>	6/1/2028	3.550%		273	273	New York
880591409 <sup>(4)</sup>	5/1/2029	3.360%		232	232	New York
880591DM1	5/1/2030	7.125%		1,000	1,000	New York, Luxembourg
880591DP4	6/7/2032	6.587% <sup>(3)</sup>		335	324	New York, Luxembourg
880591DV1	7/15/2033	4.700%		472	472	New York, Luxembourg
880591EF5	6/15/2034	3.770%		303	332	None
880591DX7	6/15/2035	4.650%		436	436	New York
880591CK6	4/1/2036	5.980%		121	121	New York
880591CS9	4/1/2036	5.880%		1,500	1,500	New York
880591CP5	1/15/2038	6.150%		1,000	1,000	New York
880591ED0	6/15/2038	5.500%		500	500	New York
880591EH1	9/15/2039	5.250%		2,000	2,000	New York
880591EP3	12/15/2042	3.500%		1,000	1,000	New York
880591DU3	6/7/2043	4.962% <sup>(3)</sup>		201	195	New York, Luxembourg
880591CF7	7/15/2045	6.235%	7/15/2020	140	140	New York
880591EB4	1/15/2048	4.875%		500	500	New York, Luxembourg
880591DZ2	4/1/2056	5.375%		1,000	1,000	New York
880591EJ7	9/15/2060	4.625%		1,000	1,000	New York
880591ES7	9/15/2065	4.250%		1,000	1,000	New York
Subtotal				20,357	21,063	
Unamortized discounts, premiums, issue costs, and other				(152 )	(162 )	
Total long-term outstanding power bonds,				20,205	20,901	

net

Long-term debt of variable interest entities, net	1,164	1,199
Long-term notes payable	69	48
Total long-term debt, net	\$21,438	\$22,148

Notes

(1) Includes net exchange gain from currency transactions of \$125 million at September 30, 2017 and \$150 million at September 30, 2016.

(2) Includes one electronotes<sup>®</sup> issue with partial maturities of principal for each required annual payment.

(3) The coupon rate represents TVA's effective interest rate.

(4) TVA PARRS, CUSIP numbers 880591300 and 880591409, may be redeemed under certain conditions. See Put and Call Options above.

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## Maturities Due in the Year Ending September 30

	2018	2019	2020	2021	2022	Thereafter	Total
Long-term power bonds, long-term debt of variable interest entities, and notes payable including current maturities <sup>(1)</sup>	\$ 1,817	\$ 1,116	\$ 93	\$ 1,901	\$ 1,071	\$ 17,545	\$ 23,543
Short-term debt, net of discounts	1,998	—	—	—	—	—	1,998

## Note

(1) Long-term power bonds does not include noncash items of foreign currency exchange gain of \$125 million, unamortized debt issue costs of \$59 million, and net discount on sale of Bonds of \$93 million. Long-term debt of variable interest entities does not include noncash item of unamortized debt issue costs of \$11 million.

## Credit Facility Agreements

TVA and the U.S. Treasury, pursuant to the TVA Act, have entered into a memorandum of understanding under which the U.S. Treasury provides TVA with a \$150 million credit facility. This credit facility was renewed for 2018 with a maturity date of September 30, 2018. Access to this credit facility or other similar financing arrangements with the U.S. Treasury has been available to TVA since the 1960s. TVA can borrow under the U.S. Treasury credit facility only if it cannot issue Bonds in the market on reasonable terms, and TVA considers the U.S. Treasury credit facility a secondary source of liquidity. The interest rate on any borrowing under this facility is based on the average rate on outstanding marketable obligations of the United States with maturities from date of issue of one year or less. There were no outstanding borrowings under the facility at September 30, 2017. The availability of this credit facility may be impacted by how the U.S. government addresses the possibility of approaching its debt limit.

TVA also has funding available under the four long-term revolving credit facilities totaling \$2.7 billion: a \$150 million credit facility that matures on December 12, 2019, a \$500 million credit facility that matures on February 1, 2021, a \$1.0 billion credit facility that matures on June 2, 2020, and a \$1.0 billion credit facility that matures on September 30, 2020. The interest rate on any borrowing under these facilities varies based on market factors and the rating of TVA's senior unsecured, long-term, non-credit-enhanced debt. TVA is required to pay an unused facility fee on the portion of the total \$2.7 billion that TVA has not borrowed or committed under letters of credit. This fee, along with letter of credit fees, may fluctuate depending on the rating of TVA's senior unsecured, long-term, non-credit-enhanced debt. At September 30, 2017, and September 30, 2016, there were \$1.2 billion and \$1.4 billion, respectively, of letters of credit outstanding under the facilities, and there were no borrowings outstanding. See Note 15 — Other Derivative Instruments — Collateral.

The following table provides additional information regarding TVA's funding available under the four long-term revolving credit facilities:

## Summary of Long-Term Credit Facilities

At September 30, 2017

Maturity Date	Facility Limit	Letters of Credit Outstanding	Cash Borrowings	Availability
December 2019	\$ 150	\$ 38	\$ —	\$ 112
February 2021	500	500	—	—
June 2020	1,000	278	—	722
September 2020	1,000	335	—	665
Total	\$ 2,650	\$ 1,151	\$ —	\$ 1,499

## Lease/Leasebacks

Prior to 2004, TVA received approximately \$945 million in proceeds by entering into lease/leaseback transactions for 24 new peaking CTs. TVA also received approximately \$389 million in proceeds by entering into lease/leaseback transactions for qualified technological equipment and software ("QTE") in 2003. Due to TVA's continuing involvement in the operation and maintenance of the leased units and equipment and its control over the distribution of power produced by the combustion turbine facilities during the leaseback term, TVA accounted for the lease proceeds as financing obligations. On September 20, 2017, TVA acquired 100 percent of the equity interests in two SPEs created for the purpose of facilitating a portion of the leaseback arrangements. As a result of the acquisition, TVA effectively settled \$70 million of its leaseback obligations related to eight CTs. On July 20, 2016, TVA acquired 100 percent of the equity interests in two SPEs created for the purpose of facilitating lease/leaseback arrangements. As a result of the acquisition, TVA effectively settled \$70 million of its leaseback obligations related to eight CTs. See Note 9. At September 30, 2017, and 2016, the outstanding leaseback obligations related to the remaining CTs and QTE were \$338 million and \$467 million, respectively.

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## 14. Accumulated Other Comprehensive Income (Loss)

AOCI represents market valuation adjustments related to TVA's currency swaps. The currency swaps are cash flow hedges and are the only derivatives in TVA's portfolio that have been designated and qualify for hedge accounting treatment. TVA records exchange rate gains and losses on its foreign currency-denominated debt in net income and marks its currency swap assets and liabilities to fair value through other comprehensive income (loss) ("OCI"). TVA then reclassifies an amount out of AOCI into net income, offsetting the exchange gain/loss recorded on the debt. For the years ended September 30, 2017 and 2016, TVA reclassified \$26 million of gains and \$129 million of losses, respectively, related to its cash flow hedges from AOCI to Interest expense. See Note 15.

TVA records certain assets and liabilities that result from the regulated ratemaking process that would not be recorded under GAAP for non-regulated entities. As such, certain items that would generally be reported in AOCI or that would impact the consolidated statements of operations are recorded as regulatory assets or regulatory liabilities. See Note 7 for a schedule of regulatory assets and liabilities. See Note 15 for a discussion of the recognition in AOCI of gains and losses associated with certain derivative contracts. See Note 16 for a discussion of the recognition of certain investment fund gains and losses as regulatory assets and liabilities. See Note 20 for a discussion of the regulatory accounting related to components of TVA's benefit plans.

## 15. Risk Management Activities and Derivative Transactions

TVA is exposed to various risks. These include risks related to commodity prices, investment prices, interest rates, currency exchange rates, and inflation as well as counterparty credit and performance risks. To help manage certain of these risks, TVA has entered into various derivative transactions, principally commodity option contracts, forward contracts, swaps, swaptions, futures, and options on futures. Other than certain derivative instruments in its trust investment funds, it is TVA's policy to enter into these derivative transactions solely for hedging purposes and not for speculative purposes. TVA has suspended its FTP and no longer uses financial instruments to hedge risks related to commodity prices; however, TVA plans to continue to manage fuel price volatility through other methods and to periodically reevaluate its suspended FTP program for future use of financial instruments.

## Overview of Accounting Treatment

TVA recognizes certain of its derivative instruments as either assets or liabilities on its consolidated balance sheets at fair value. The accounting for changes in the fair value of these instruments depends on (1) whether TVA uses regulatory accounting to defer the derivative gains and losses, (2) whether the derivative instrument has been designated and qualifies for hedge accounting treatment, and (3) if so, the type of hedge relationship (for example, cash flow hedge).

The following tables summarize the accounting treatment that certain of TVA's financial derivative transactions receive:

## Summary of Derivative Instruments That Receive Hedge Accounting Treatment (part 1)

## Amount of Mark-to-Market Gain (Loss) Recognized in Other Comprehensive Income (Loss)

For the years ended September 30

## Derivatives in Cash

Flow Hedging Relationship	Objective of Hedge Transaction	Accounting for Derivative Hedging Instrument	2017	2016
Currency swaps	To protect against changes in cash flows caused by changes in foreign currency exchange rates (exchange rate risk)	Unrealized gains and losses are recorded in AOCI and reclassified to interest expense to the extent they are offset by gains and losses on the hedged transaction	\$ 59	\$(139)

Summary of Derivative Instruments That Receive Hedge

Accounting Treatment (part 2)<sup>(1)</sup>

Amount of Gain (Loss) Reclassified from OCI to Interest  
Expense

For the years ended September 30

Derivatives in Cash Flow Hedging Relationship	2017	2016
Currency swaps	\$ 26	\$(129)

Note

(1) There were no ineffective portions or amounts excluded from effectiveness testing for any of the periods presented. Based on forecasted foreign currency

exchange rates, TVA expects to reclassify approximately \$18 million of losses from AOCI to interest expense within the next twelve months to offset amounts

anticipated to be recorded in interest expense related to exchange gain on the debt.

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Summary of Derivative Instruments That Do Not Receive Hedge Accounting Treatment  
Amount of Gain (Loss) Recognized in Income on Derivatives<sup>(1)</sup>  
For the years ended September 30

Derivative Type	Objective of Derivative	Accounting for Derivative Instrument	2017	2016
Interest rate swaps	To fix short-term debt variable rate to a fixed rate (interest rate risk)	Mark-to-Market gains and losses are recorded as regulatory assets or liabilities. Realized gains and losses are recognized in interest expense when incurred during the settlement period.	\$(101)	\$(109)
Commodity derivatives under FTP	To protect against fluctuations in market prices of purchased commodities (price risk)	Mark-to-Market gains and losses are recorded as regulatory assets or liabilities. Realized gains and losses are recognized in fuel expense or purchased power expense when the related commodity is used in production.	(36 )	(94 )

## Note

(1) All of TVA's derivative instruments that do not receive hedge accounting treatment have unrealized gains (losses) that would otherwise be recognized in income but instead are deferred as regulatory assets and liabilities. As such, there was no related gain (loss) recognized in income for these unrealized gains (losses) for the years ended September 30, 2017 and 2016.

## Fair Values of TVA Derivatives

At September 30

	2017		2016	
	Balance	Balance Sheet Presentation	Balance	Balance Sheet Presentation
<b>Derivatives That Receive Hedge Accounting Treatment:</b>				
Currency swaps				
£200 million Sterling	\$(67 )	Accounts payable and accrued liabilities \$(5); Other long-term liabilities \$(62)	\$(82 )	Other long-term liabilities
£250 million Sterling	(15 )	Accounts payable and accrued liabilities \$(4); Other long-term liabilities \$(11)	(41 )	Other long-term liabilities
£150 million Sterling	(21 )	Accounts payable and accrued liabilities \$(2); Other long-term liabilities \$(19)	(39 )	Other long-term liabilities
<b>Derivatives That Do Not Receive Hedge Accounting Treatment:</b>				
Interest rate swaps				
\$1.0 billion notional	\$(1,093)	Accounts payable and accrued liabilities \$(66); Other long-term liabilities \$(1,027)	\$(1,387)	Other long-term liabilities
\$476 million notional	(410 )	Accounts payable and accrued liabilities \$(25); Other long-term liabilities \$(385)	(539 )	Other long-term liabilities
\$42 million notional	(8 )	Accounts payable and accrued liabilities \$(2); Other long-term liabilities \$(6)	(12 )	Other long-term liabilities
Commodity contract derivatives	(60 )	Other current assets \$8; Other long-term assets \$2; Other long-term liabilities \$(9); Accounts payable and accrued	(125 )	Other current assets \$6; Other long-term assets \$3; Other long-term liabilities \$(49); Accounts payable and accrued



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		liabilities \$(61)		liabilities \$(85)
FTP				
Derivatives under FTP <sup>(1)</sup>	(5	) Other current assets \$(4); Accounts payable and accrued liabilities \$(1)	(39	) Other current assets \$(30); Other long-term liabilities \$(2); Accounts payable and accrued liabilities \$(7)

Note

(1) Fair values of certain derivatives under the FTP that were in net liability positions totaling \$4 million and \$30 million at September 30, 2017 and 2016, respectively, are recorded in TVA's margin cash accounts in Other current assets. These derivatives are transacted with futures commission merchants, and cash deposits have been posted to the margin cash accounts held with each futures commission merchant to offset the net liability positions in full.

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## Cash Flow Hedging Strategy for Currency Swaps

To protect against exchange rate risk related to three British pound sterling denominated Bond transactions, TVA entered into foreign currency hedges at the time the Bond transactions occurred. TVA had the following currency swaps outstanding at September 30, 2017:

## Currency Swaps Outstanding

At September 30, 2017

Effective Date of Currency Swap Contract	Associated TVA Bond Issues Currency Exposure	Expiration Date of Swap	Overall Effective Cost to TVA
1999	£200 million	2021	5.81%
2001	£250 million	2032	6.59%
2003	£150 million	2043	4.96%

When the dollar strengthens against the British pound sterling, the exchange gain on the Bond liability is offset by an equal amount of loss on the swap contract that is reclassified out of AOCI. Conversely, the exchange loss on the Bond liability is offset by an equal amount of gain on the swap contract that is reclassified out of AOCI. All such exchange gains or losses on the Bond liability are included in Long-term debt, net. The offsetting exchange losses or gains on the swap contracts are recognized in AOCI. If any gain (loss) were to be incurred as a result of the early termination of the foreign currency swap contract, the resulting income (expense) would be amortized over the remaining life of the associated Bond as a component of Interest expense. The values of the currency swap liabilities are included in Accounts payable and accrued liabilities and Other long-term liabilities on the consolidated balance sheets.

## Derivatives Not Receiving Hedge Accounting Treatment

**Interest Rate Derivatives.** Generally TVA uses interest rate swaps to fix variable short-term debt to a fixed rate, and TVA uses regulatory accounting treatment to defer the MtM gains and losses on its interest rate swaps. The net deferred unrealized gains and losses are classified as regulatory assets or liabilities on TVA's consolidated balance sheets and are included in the ratemaking formula when gains or losses are realized. The values of these derivatives are included in Accounts payable and accrued liabilities and Other long-term liabilities on the consolidated balance sheets, and realized gains and losses, if any, are included in TVA's consolidated statements of operations. For the years ended September 30, 2017 and 2016, the changes in market value of the interest rate derivatives resulted in deferred unrealized gains of \$472 million and unrealized losses of \$311 million, respectively.

**Commodity Derivatives.** TVA enters into certain derivative contracts for coal and natural gas that require physical delivery of the contracted quantity of the commodity. TVA marks to market all such contracts and defers the fair values as regulatory assets or liabilities on a gross basis. At September 30, 2017, TVA's coal contract derivatives had terms of up to two years and TVA's natural gas contract derivatives had terms of up to four years.

## Commodity Contract Derivatives

At September 30

	2017			2016		
	Number of Contracts	Notional Amount	Fair Value (MtM)	Number of Contracts	Notional Amount	Fair Value (MtM)
Coal contract derivatives	20	17 million tons	\$ (67 )	20	20 million tons	\$ (127 )
	53		\$ 7	39		\$ 2

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Natural gas contract derivatives	271 million mmBtu	148 million mmBtu
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Derivatives Under FTP. While TVA has suspended its FTP and no longer uses financial instruments to hedge risks related to commodity prices, certain natural gas swaps with a maturity of one year or less remain as part of the suspended FTP. Under the FTP, TVA was authorized to purchase and sell futures, swaps, options, and combinations of these instruments (as long as they were standard in the industry) to hedge TVA's exposure to (1) the price of natural gas, fuel oil, electricity, coal, emission allowances, nuclear fuel, and other commodities included in TVA's fuel cost adjustment calculation, (2) the price of construction materials, and (3) contracts for goods priced in or indexed to foreign currencies. The combined transaction limit for the fuel cost adjustment and construction material transactions was \$130 million (based on one-day value at risk). In addition, the maximum hedge volume for the construction material transactions was 75 percent of the underlying net notional volume of the material that TVA anticipated using in approved TVA projects, and the market value of all outstanding hedging transactions involving construction materials was limited to \$100 million at the execution of any new transaction. The portfolio value at risk limit for the foreign currency transactions was \$5 million and was separate and distinct from the \$130 million transaction limit discussed above. TVA's policy prohibits trading financial instruments under the FTP for speculative purposes.

Table of ContentsDerivatives under Financial Trading Program <sup>(1)</sup>

At September 30

	2017		2016	
	Notional	Fair	Notional	Fair
	Amount	Value	Amount	Value
	(in	(MtM)	(in	(MtM)
	mmBtu)	(in	mmBtu)	(in
		millions)		millions)

Natural gas

Swap contracts 2,800,000 \$ (5 ) 21,052,500 \$ (39 )

Note

(1) Fair value amounts presented are based on the net commodity position with the counterparty. Notional amounts disclosed represent the net value of contractual amounts.

TVA defers all FTP unrealized gains (losses) as regulatory liabilities (assets) and records only realized gains or losses to match the delivery period of the underlying commodity. In addition to the open commodity derivatives disclosed above, TVA had closed derivative contracts with market values of \$(3) million and \$(5) million at September 30, 2017 and 2016, respectively. TVA experienced the following unrealized and realized gains and losses related to the FTP at the dates and during the periods, as applicable, set forth in the tables below:

## Financial Trading Program Unrealized Gains (Losses)

At September 30

FTP unrealized gains (losses) deferred as regulatory liabilities (assets)	2017	2016
Natural gas	\$(5)	\$(39)

## Financial Trading Program Realized Gains

(Losses)

At September 30

Decrease (increase) in fuel expense	2017	2016
Natural gas	\$(29)	\$(75)
Decrease (increase) in purchased power expense		
Natural gas		\$(7) \$(19)

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## Offsetting of Derivative Assets and Liabilities

The amounts of TVA's derivative instruments as reported in the consolidated balance sheets as of September 30, 2017, and September 30, 2016, are shown in the table below.

	At September 30, 2017		
	Gross Amounts of Recognized Assets/Liabilities Sheet <sup>(1)</sup>	Gross Amounts Offset in the Balance Sheet <sup>(1)</sup>	Net Amounts of Assets/Liabilities Presented in the Balance Sheet <sup>(2)</sup>
<b>Assets</b>			
Commodity derivatives not subject to master netting or similar arrangement	\$ 10	\$ —	\$ 10
<b>Liabilities</b>			
Currency swap(s) <sup>(3)</sup>	\$ 103	\$ —	\$ 103
Interest rate swaps <sup>(3)</sup>	1,511	—	1,511
Commodity derivatives under FTP	5	(4 )	1
Total derivatives subject to master netting or similar arrangement	1,619	(4 )	1,615
Total derivatives not subject to master netting or similar arrangement	70	—	70
Total liabilities	\$ 1,689	\$ (4 )	\$ 1,685
	At September 30, 2016		
	Gross Amounts of Recognized Assets/Liabilities Sheet <sup>(1)</sup>	Gross Amounts Offset in the Balance Sheet <sup>(1)</sup>	Net Amounts of Assets/Liabilities Presented in the Balance Sheet <sup>(2)</sup>
<b>Assets</b>			
Commodity derivatives under FTP subject to master netting or similar agreement	\$ 6	\$ (6 )	\$ —
Commodity derivatives not subject to master netting or similar arrangement	9	—	9
Total assets	\$ 15	\$ (6 )	\$ 9
<b>Liabilities</b>			
Currency swap(s) <sup>(3)</sup>	\$ 162	\$ —	\$ 162
Interest rate swaps <sup>(3)</sup>	1,938	—	1,938
Commodity derivatives under FTP	45	(36 )	9
Total derivatives subject to master netting or similar arrangement	2,145	(36 )	2,109
Total derivatives not subject to master netting or similar arrangement	134	—	134
Total liabilities	\$ 2,279	\$ (36 )	\$ 2,243

## Notes

(1) Amounts primarily include counterparty netting of derivative contracts, margin account deposits for futures commission merchants transactions, and cash collateral received or paid in accordance with the accounting guidance for derivatives and hedging transactions.

(2) There are no derivative contracts subject to a master netting arrangement or similar agreement which are not offset in the balance sheets.

(3) Letters of credit of approximately \$1.2 billion and \$1.4 billion were posted as collateral at September 30, 2017 and 2016, respectively, to partially secure the liability positions of one of the currency swaps and one of the interest rate swaps in accordance with the collateral requirements for these derivatives.

#### Other Derivative Instruments

**Investment Fund Derivatives.** Investment funds consist primarily of funds held in the NDT, ART, SERP, and DCP. All securities in the trusts are classified as trading. See Note 16 — Investments Funds for a discussion of the trusts' objectives and the types of investments that they hold. The NDT and ART may invest in derivative instruments which may include swaps, futures, options, forwards, and other instruments. At September 30, 2017 and 2016, the NDT held investments in forward contracts to purchase debt securities. The fair values of these derivatives were in asset positions totaling \$19 million at September 30, 2017, and asset positions totaling \$15 million at September 30, 2016.

**Collateral.** TVA's interest rate swaps and currency swaps contain contract provisions that require a party to post collateral (in a form such as cash or a letter of credit) when the party's liability balance under the agreement exceeds a certain threshold. At September 30, 2017, the aggregate fair value of all derivative instruments with credit-risk related contingent features that were in a liability position was \$1.6 billion. TVA's collateral obligations at September 30, 2017, under these

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arrangements, were approximately \$1.1 billion, for which TVA had posted approximately \$1.2 billion in letters of credit. These letters of credit reduce the available balance under the related credit facilities. TVA's assessment of the risk of its nonperformance includes a reduction in its exposure under the contract as a result of this posted collateral.

For all of its derivative instruments with credit-risk related contingent features:

If TVA remains a majority-owned U.S. government entity but Standard & Poor's Financial Services, LLC ("S&P") or Moody's Investors Service, Inc. ("Moody's") downgrades TVA's credit rating to AA or Aa2, respectively, TVA's collateral obligations would likely increase by \$22 million; and

If TVA ceases to be majority-owned by the U.S. government, TVA's credit rating would likely be downgraded and TVA would be required to post additional collateral.

## Counterparty Risk

TVA may be exposed to certain risks when a counterparty has the potential to fail to meet its obligations in accordance with agreed terms. These risks may be related to credit, operational, or nonperformance matters. To mitigate certain counterparty risk, TVA analyzes the counterparty's financial condition prior to entering into an agreement, establishes credit limits, monitors the appropriateness of those limits, as well as any changes in the creditworthiness of the counterparty, on an ongoing basis, and when required, employs credit mitigation measures, such as collateral or prepayment arrangements and master purchase and sale agreements, to mitigate credit risk.

Customers. TVA is exposed to counterparty credit risk associated with trade accounts receivable from delivered power sales to LPCs, and from industries and federal agencies directly served, all located in the Tennessee Valley region. Of the \$1.4 billion and \$1.6 billion of receivables from power sales outstanding at September 30, 2017 and 2016, respectively, nearly all were rated investment grade. TVA is also exposed to risk from exchange power arrangements with a small number of investor-owned regional utilities related to either delivered power or the replacement of open positions of longer-term purchased power or fuel agreements. TVA believes its policies and procedures for counterparty performance risk reviews have generally protected TVA against significant exposure related to market and economic conditions. See Note 1 — Allowance for Uncollectible Accounts and Note 3.

TVA had revenue from six LPCs that accounted for 33 percent of total operating revenue for the years ended both September 30, 2017 and September 30, 2016.

Suppliers. If one of TVA's fuel or purchased power suppliers fails to perform under the terms of its contract with TVA, TVA might lose the money that it paid to the supplier under the contract and have to purchase replacement fuel or power on the spot market, perhaps at a significantly higher price than TVA was entitled to pay under the contract. In addition, TVA might not be able to acquire replacement fuel or power in a timely manner and thus might be unable to satisfy its own obligations to deliver power. Nuclear fuel requirements, including uranium mining and milling, conversion services, enrichment services, and fabrication services, are met from various suppliers, depending on the type of service. TVA purchases the majority of its natural gas requirements from a variety of suppliers under short-term contracts.

To help ensure a reliable supply of coal, TVA had coal contracts with multiple suppliers at September 30, 2017. The contracted supply of coal is sourced from multiple geographic regions of the United States and is to be delivered via various transportation methods (i.e., barge, rail, and truck). Emerging technologies, environmental regulations, and low natural gas prices have contributed to weak demand for coal. As a result, coal suppliers are facing increased financial pressure, which has led to relatively poor credit ratings and bankruptcies. Continued difficulties by coal suppliers could result in consolidations, additional bankruptcies, restructurings, contract renegotiations, or other

scenarios. Under these scenarios and TVA's potential available responses, TVA does not anticipate a significant financial impact in obtaining continued fuel supply for its coal-fired generation.

On March 29, 2017, one of TVA's suppliers filed for protection under Chapter 11 of the United States Bankruptcy Code. Certain subsidiaries of the parent company have entered into contracts to supply goods and services to TVA, including contracts for the enrichment and fabrication of nuclear fuel and the manufacture of a steam generator, as well as several ongoing agreements for maintenance and outage support at its nuclear and coal-fired plants. TVA is assessing potential performance impacts, including procurement of parts and services as well as outage schedules. The suppliers are currently performing under the TVA contracts; however, if any supplier is unable to perform under TVA's existing contracts and TVA is unable to obtain similar services at similar terms from other vendors, TVA could experience delays, disruptions, additional costs, or other operational outcomes which TVA cannot predict at this time, but which could be material.

TVA has a power purchase agreement that expires on March 31, 2032, with a supplier of electricity for 440 megawatts ("MW") of summer net capability from a lignite-fired generating plant. TVA has determined that the supplier has the equivalent of a non-investment grade credit rating; therefore, the supplier has provided credit assurance to TVA under the terms of the agreement.



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Derivative Counterparties. TVA has entered into physical and financial contracts that qualify as derivatives for hedging purposes, and TVA's NDT fund and qualified defined benefit pension plan have entered into derivative contracts for investment purposes. If a counterparty to one of TVA's hedging transactions defaults, TVA might incur substantial costs in connection with entering into a replacement hedging transaction. If a counterparty to the derivative contracts into which the NDT fund and the qualified pension plan have entered for investment purposes defaults, the value of the investment could decline significantly or perhaps become worthless. TVA has concentrations of credit risk from the banking and coal industries because multiple companies in these industries serve as counterparties to TVA in various derivative transactions. At September 30, 2017, all of TVA's commodity derivatives under the FTP, currency swaps, and interest rate swaps as well as all of the derivatives in the NDT were with banking counterparties whose Moody's credit ratings were A3 or higher.

TVA classifies qualified forward coal and natural gas contracts as derivatives. See Derivatives Not Receiving Hedge Accounting Treatment above. At September 30, 2017, the coal contracts were with counterparties whose Moody's credit rating, or TVA's internal analysis when such information was unavailable, ranged from Ca to Ba2. At September 30, 2017, the natural gas contracts were with counterparties whose ratings ranged from B1 to A2. See Suppliers above for discussion of challenges facing the coal industry. TVA's total value for derivative contracts with coal and natural gas counterparties in an asset position as of September 30, 2017, was approximately \$10 million.

TVA currently utilizes two futures commission merchants ("FCMs") to clear commodity contracts, including futures, options, and similar financial derivatives. These transactions are executed under the FTP by the FCMs on exchanges on behalf of TVA. TVA maintains margin cash accounts with the FCMs. TVA makes deposits to the margin cash accounts to adequately cover any net liability positions on its derivatives transacted with the FCMs. See the note to the Fair Values of TVA Derivatives table above.

16. Fair Value Measurements

Fair value is determined based on the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the asset or liability's principal market, or in the absence of a principal market, the most advantageous market for the asset or liability in an orderly transaction between market participants. TVA uses market or observable inputs as the preferred source of values, followed by assumptions based on hypothetical transactions in the absence of market inputs.

Valuation Techniques

The measurement of fair value results in classification into a hierarchy by the inputs used to determine the fair value as follows:

- Level 1—Unadjusted quoted prices in active markets accessible by the reporting entity for identical assets or liabilities. Active markets are those in which transactions for the asset or liability occur with sufficient frequency and volume to provide pricing.  
Pricing inputs other than quoted market prices included in Level 1 that are based on observable market data and that are directly or indirectly observable for substantially the full term of the asset or liability.
- Level 2—include quoted market prices for similar assets or liabilities, quoted market prices for identical or similar assets in markets that are not active, adjusted quoted market prices, inputs from observable data such as interest rate and yield curves, volatilities and default rates observable at commonly quoted intervals, and inputs derived from observable market data by correlation or other means.
- Level 3—Pricing inputs that are unobservable, or less observable, from objective sources. Unobservable inputs are only to be used to the extent observable inputs are not available. These inputs maintain the concept of an exit price from the perspective of a market participant and should reflect assumptions of other market participants. An entity should consider all market participant assumptions that are available without unreasonable cost and

effort. These are given the lowest priority and are generally used in internally developed methodologies to generate management's best estimate of the fair value when no observable market data is available.

A financial instrument's level within the fair value hierarchy (where Level 1 is the highest and Level 3 is the lowest) is based on the lowest level of input significant to the fair value measurement.

The following sections describe the valuation methodologies TVA uses to measure different financial instruments at fair value. Except for gains and losses on SERP and DCP assets, all changes in fair value of these assets and liabilities have been recorded as changes in regulatory assets, regulatory liabilities, or AOCI on TVA's consolidated balance sheets and consolidated statements of comprehensive income (loss). Except for gains and losses on SERP and DCP assets, there has been no impact to the consolidated statements of operations or the consolidated statements of cash flows related to these fair value measurements.

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### Investment Funds

At September 30, 2017, Investment funds were composed of \$2.6 billion of securities classified as trading and measured at fair value. Trading securities are held in the NDT, ART, SERP, and DCP. The NDT holds funds for the ultimate decommissioning of TVA's nuclear power plants. The ART holds funds primarily for the costs related to the future closure and retirement of TVA's other long-lived assets. The balances in the NDT and ART were \$1.9 billion and \$632 million, respectively, at September 30, 2017.

TVA established a SERP to provide benefits to selected employees of TVA which are comparable to those provided by competing organizations. The DCP is designed to provide participants with the ability to defer compensation until employment with TVA ends. NDT and SERP funds are invested in portfolios of securities generally designed to achieve a return in line with overall equity market performance, and ART and DCP funds are invested in portfolios of securities generally designed to achieve a return in line with overall debt and equity market performance.

The NDT, ART, SERP, and DCP are composed of multiple types of investments and are managed by external institutional investment managers. Most U.S. and international equities, U.S. Treasury inflation-protected securities, real estate investment trust securities, and cash securities and certain derivative instruments are measured based on quoted exchange prices in active markets and are classified as Level 1 valuations. Fixed-income investments, high-yield fixed-income investments, currencies, and most derivative instruments are non-exchange traded and are classified as Level 2 valuations. These measurements are based on market and income approaches with observable market inputs.

Private equity limited partnerships and private real estate investments may include holdings of investments in private real estate, venture capital, buyout, mezzanine or subordinated debt, restructuring or distressed debt, and special situations through funds managed by third-party investment managers. These investments generally involve a three to four year period where the investor contributes capital, followed by a period of distribution, typically over several years. The investment period is generally, at a minimum, 10 years or longer. The NDT had unfunded commitments related to private equity limited partnerships of \$50 million and unfunded commitments related to private real estate of \$5 million at September 30, 2017. These investments have no redemption or limited redemption options and may also impose restrictions on the NDT's ability to liquidate its investments. There are no readily available quoted exchange prices for these investments. The fair value of the investments is based on TVA's ownership percentage of the fair value of the underlying investments as provided by the investment managers. These investments are typically valued on a quarterly basis. TVA's private equity limited partnerships and private real estate investments are valued at net asset values ("NAV") as a practical expedient for fair value. TVA classifies its interest in these types of investments as investments measured at net asset value in the fair value hierarchy.

Commingled funds represent investment funds comprising multiple individual financial instruments. The commingled funds held by the NDT, ART, SERP, and DCP consist of either a single class of securities, such as equity, debt, or foreign currency securities, or multiple classes of securities. All underlying positions in these commingled funds are either exchange traded or measured using observable inputs for similar instruments. The fair value of commingled funds is based on NAV per fund share (the unit of account), derived from the prices of the underlying securities in the funds. These commingled funds can be redeemed at the measurement date NAV and are classified as Commingled funds measured at net asset value in the fair value hierarchy.

Realized and unrealized gains and losses on trading securities are recognized in current earnings and are based on average cost. The gains and losses of the NDT and ART are subsequently reclassified to a regulatory asset or liability account in accordance with TVA's regulatory accounting policy. See Note 1 — Cost-Based Regulation. TVA recorded unrealized gains and losses related to its trading securities held during each period as follows:

Unrealized Investment Gains (Losses)

At September 30

Financial Statement Presentation	2017	2016
SERP Other income (expense)	\$ 4	\$ 2
DCP Other income (expense)	2	1
NDT Regulatory asset	92	89
ART Regulatory asset	43	29

#### Currency and Interest Rate Derivatives

See Note 15 — Cash Flow Hedging Strategy for Currency Swaps and Derivatives Not Receiving Hedge Accounting Treatment for a discussion of the nature, purpose, and contingent features of TVA's currency swaps and interest rate swaps. These swaps are classified as Level 2 valuations and are valued based on income approaches using observable market inputs for similar instruments.

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Commodity Contract Derivatives and Commodity Derivatives Under FTP

Commodity Contract Derivatives. Most of these contracts are valued based on market approaches which utilize short- and mid-term market-quoted prices from an external industry brokerage service. A small number of these contracts are valued based on a pricing model using long-term price estimates from TVA's coal price forecast. To value the volume option component of applicable coal contracts, TVA uses a Black-Scholes pricing model which includes inputs from the forecast, contract-specific terms, and other market inputs. These contracts are classified as Level 3 valuations.

Commodity Derivatives Under FTP. These contracts are valued based on market approaches which utilize Chicago Mercantile Exchange ("CME") quoted prices and other observable inputs. Swap contracts are valued using a pricing model based on CME inputs and are subject to nonperformance risk outside of the exit price. These contracts are classified as Level 2 valuations.

See Note 15 — Derivatives Not Receiving Hedge Accounting Treatment — Commodity Derivatives and — Derivatives Under FTP for a discussion of the nature and purpose of coal contracts and derivatives under TVA's FTP.

Nonperformance Risk

The assessment of nonperformance risk, which includes credit risk, considers changes in current market conditions, readily available information on nonperformance risk, letters of credit, collateral, other arrangements available, and the nature of master netting arrangements. TVA is a counterparty to currency swaps, interest rate swaps, commodity contracts, and other derivatives which subject TVA to nonperformance risk. Nonperformance risk on the majority of investments and certain exchange-traded instruments held by TVA is incorporated into the exit price that is derived from quoted market data that is used to mark the investment to market.

Nonperformance risk for most of TVA's derivative instruments is an adjustment to the initial asset/liability fair value. TVA adjusts for nonperformance risk, both of TVA (for liabilities) and the counterparty (for assets), by applying credit valuation adjustments ("CVAs"). TVA determines an appropriate CVA for each applicable financial instrument based on the term of the instrument and TVA's or the counterparty's credit rating as obtained from Moody's. For companies that do not have an observable credit rating, TVA uses internal analysis to assign a comparable rating to the counterparty. TVA discounts each financial instrument using the historical default rate (as reported by Moody's for CY 1983 to CY 2016) for companies with a similar credit rating over a time period consistent with the remaining term of the contract. The application of CVAs resulted in a less than \$1 million decrease in the fair value of assets and a \$1 million decrease in the fair value of liabilities at September 30, 2017.

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## Fair Value Measurements

The following tables set forth by level, within the fair value hierarchy, TVA's financial assets and liabilities that were measured at fair value on a recurring basis at September 30, 2017, and 2016. Financial assets and liabilities have been classified in their entirety based on the lowest level of input that is significant to the fair value measurement. TVA's assessment of the significance of a particular input to the fair value measurement requires judgment and may affect the determination of the fair value of the assets and liabilities and their classification in the fair value hierarchy levels.

## Fair Value Measurements

At September 30, 2017

	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
Assets				
Investments				
Equity securities	\$ 226	\$ —	\$ —	\$226
Government debt securities	100	42	—	142
Corporate debt securities	—	373	—	373
Mortgage and asset-backed securities	—	49	—	49
Institutional mutual funds	94	—	—	94
Forward debt securities contracts	—	19	—	19
Private equity funds measured at net asset value <sup>(1)</sup>	—	—	—	136
Private real estate funds measured at net asset value <sup>(1)</sup>	—	—	—	113
Commingled funds measured at net asset value <sup>(1)</sup>	—	—	—	1,451
Total investments	420	483	—	2,603
Commodity contract derivatives	—	8	2	10
Total	\$ 420	\$ 491	\$ 2	\$2,613

	Quoted Prices in Active Markets for Identical Liabilities (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
Liabilities				
Currency swap(s) <sup>(2)</sup>	\$ —	\$ 103	\$ —	\$103
Interest rate swaps	—	1,511	—	1,511
Commodity contract derivatives	—	1	69	70
Commodity derivatives under FTP <sup>(2)</sup>	—	1	—	1
Swap contracts	—	1	—	1
Total	\$ —	\$ 1,616	\$ 69	\$1,685
Notes				

(1) Certain investments that are measured at fair value using the net asset value per share (or its equivalent) practical expedient have not been categorized in the fair value hierarchy. The fair value amounts presented in this table are intended to permit reconciliation of the fair value hierarchy to the amounts presented in the consolidated balance sheets.

(2) Due to the right of setoff and method of settlement, TVA elects to record commodity derivatives under the FTP based on its net commodity position with the counterparty or FCM. Deposits are made to TVA's margin cash accounts held with each FCM to offset any net liability positions in full for derivatives that are transacted with FCMs. TVA records currency swaps net of cash collateral received from or paid to the counterparty, to the extent such amount is not recorded in Accounts payable and accrued liabilities. See Note 15 — Offsetting of Derivative Assets and Liabilities.

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## Fair Value Measurements

At September 30, 2016

	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
Assets				
Investments				
Equity securities	\$ 196	\$ —	\$ —	\$196
Government debt securities	88	36	—	124
Corporate debt securities	—	393	—	393
Mortgage and asset-backed securities	—	50	—	50
Institutional mutual funds	92	—	—	92
Forward debt securities contracts	—	15	—	15
Private equity funds measured at net asset value <sup>(1)</sup>	—	—	—	132
Private real estate funds measured at net asset value <sup>(1)</sup>	—	—	—	113
Commingled funds measured at net asset value <sup>(1)</sup>	—	—	—	1,142
Total investments	376	494	—	2,257
Commodity contract derivatives	—	5	4	9
Total	\$ 376	\$ 499	\$ 4	\$2,266

	Quoted Prices in Active Markets for Identical Liabilities (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
Liabilities				
Currency swap(s) <sup>(2)</sup>	\$ —	\$ 162	\$ —	\$162
Interest rate swaps	—	1,938	—	1,938
Commodity contract derivatives	—	3	131	134
Commodity derivatives under FTP <sup>(2)</sup>				
Swap contracts	—	9	—	9
Total	\$ —	\$ 2,112	\$ 131	\$2,243

## Notes

(1) Certain investments that are measured at fair value using the net asset value per share (or its equivalent) practical expedient have not been categorized in the fair value hierarchy. The fair value amounts presented in this table are intended to permit reconciliation of the fair value hierarchy to the amounts presented in the consolidated balance sheets.

(2) Due to the right of setoff and method of settlement, TVA elects to record commodity derivatives under the FTP based on its net commodity position with the counterparty or FCM. Deposits are made to TVA's margin cash accounts held with each FCM to offset any net liability positions in full for derivatives that are transacted with FCMs. TVA records currency swaps net of any cash collateral received from or paid to the counterparty, to the extent such amount



is not recorded in Accounts payable and accrued liabilities. See Note 15 — Offsetting of Derivative Assets and Liabilities.

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TVA uses internal valuation specialists for the calculation of its commodity contract derivatives fair value measurements classified as Level 3. Analytical testing is performed on the change in fair value measurements each period to ensure the valuation is reasonable based on changes in general market assumptions. Significant changes to the estimated data used for unobservable inputs, in isolation or combination, may result in significant variations to the fair value measurement reported.

The following table presents a reconciliation of all commodity contract derivatives measured at fair value on a recurring basis using significant unobservable inputs (Level 3):

Fair Value Measurements Using Significant Unobservable Inputs

	Commodity Contract Derivatives
Balance at October 1, 2015	\$ (98 )
Purchases	—
Issuances	—
Sales	—
Settlements	—
Change in net unrealized gains (losses) deferred as regulatory assets and liabilities	(29 )
Balance at September 30, 2016	(127 )
Purchases	—
Issuances	—
Sales	—
Settlements	—
Change in net unrealized gains (losses) deferred as regulatory assets and liabilities	60
Balance at September 30, 2017	\$ (67 )

The following table presents quantitative information related to the significant unobservable inputs used in the measurement of fair value of TVA's assets and liabilities classified as Level 3 in the fair value hierarchy:

Quantitative Information about Level 3 Fair Value Measurements

	Fair Value at September 30 2017	Valuation Technique(s)	Unobservable Inputs	Range
<b>Assets</b>				
Commodity contract derivatives	\$ 2	Pricing model	Coal supply and demand	0.6 - 0.7 billion tons/year Long-term market prices \$11.40 - \$112.23/ton
<b>Liabilities</b>				
Commodity contract derivatives	\$ 69	Pricing model	Coal supply and demand	0.6 - 0.7 billion tons/year Long-term market prices \$11.40 - \$112.23/ton

Quantitative Information about Level 3 Fair Value Measurements

Fair Value at September	Valuation Technique(s)	Unobservable Inputs	Range
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30 2016

Assets

Commodity contract  
derivatives

\$ 4

Pricing model

Coal supply and demand 0.7 - 0.8 billion tons/year

Long-term market prices \$11.80 - \$85.02/ton

Liabilities

Commodity contract  
derivatives

\$ 131

Pricing model

Coal supply and demand 0.7 - 0.8 billion tons/year

Long-term market prices \$11.80 - \$85.02/ton

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## Other Financial Instruments Not Recorded at Fair Value

TVA uses the methods and assumptions described below to estimate the fair values of each significant class of financial instrument. The fair value of the financial instruments held at September 30, 2017, and 2016, may not be representative of the actual gains or losses that will be recorded when these instruments mature or are called or presented for early redemption. The estimated values of TVA's financial instruments not recorded at fair value at September 30, 2017, and 2016, were as follows:

## Estimated Values of Financial Instruments Not Recorded at Fair Value

	Valuation Classification	At September 30, 2017		At September 30, 2016	
		Carrying Amount	Fair Value	Carrying Amount	Fair Value
EnergyRight® receivables (including current portion)	Level 2	\$125	\$127	\$141	\$144
Loans and other long-term receivables, net (including current portion)	Level 2	\$118	\$107	\$141	\$130
EnergyRight® financing obligation (including current portion)	Level 2	\$144	\$161	\$163	\$183
Unfunded loan commitments	Level 2	\$—	\$18	\$—	\$17
Membership interests of variable interest entity subject to mandatory redemption (including current portion)	Level 2	\$32	\$41	\$35	\$46
Long-term outstanding power bonds (including current maturities), net	Level 2	\$21,933	\$26,857	\$22,456	\$28,620
Long-term debt of variable interest entities (including current maturities), net	Level 2	\$1,200	\$1,356	\$1,234	\$1,468
Long-term notes payable (including current maturities)	Level 2	\$122	\$121	\$75	\$75

Due to the short-term maturity of Cash and cash equivalents, Restricted cash and investments, and Short-term debt, net (each considered a Level 1 valuation classification), the carrying amounts of these instruments approximate their fair values.

The fair value for loans and other long-term receivables is estimated by determining the present value of future cash flows using a discount rate equal to lending rates for similar loans made to borrowers with similar credit ratings and for similar remaining maturities, where applicable.

The fair value of long-term debt traded in the public market is determined by multiplying the par value of the debt by the indicative market price at the balance sheet date. The fair value of other long-term debt and membership interests of variable interest entities subject to mandatory redemption is estimated by determining the present value of future cash flows using current market rates for similar obligations, giving effect to credit ratings and remaining maturities.

## 17. Proprietary Capital

## Appropriation Investment

TVA's power program and stewardship (nonpower) programs were originally funded primarily by appropriations from Congress. In 1959, Congress passed an amendment to the TVA Act that required TVA's power program to be self-financing from power revenues and proceeds from power program financings. While TVA's power program did not directly receive appropriated funds after it became self-financing, TVA continued to receive appropriations for certain multipurpose and other nonpower mission-related activities as well as for its stewardship activities. TVA has not received any appropriations from Congress for any activities since 1999, and since that time, TVA has funded stewardship program activities primarily with power revenues.

The 1959 amendment to the TVA Act also required TVA, beginning in 1961, to make annual payments to the U.S. Treasury from net power proceeds as a repayment of and as a return on the Power Program Appropriation Investment until a total of \$1.0 billion of the Power Program Appropriation Investment has been repaid in accordance with the 1959 amendment. TVA fulfilled its requirement to repay \$1.0 billion of the Power Program Appropriation Investment in 2014. The TVA

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Act requires TVA to continue making payments to the U.S. Treasury as a return on the remaining \$258 million of the Power Program Appropriation Investment.

The table below summarizes TVA's activities related to appropriated funds and retained earnings.

## Summary of Proprietary Capital Activity

At or for the years ended September 30

	2017		2016	
	Power Program	Nonpower Programs	Power Program	Nonpower Programs
Appropriation Investment	\$258	\$ 4,351	\$258	\$ 4,351
Retained Earnings				
Balance at beginning of year	7,594	(3,771 )	6,357	(3,761 )
Net income (expense) for year	693	(8 )	1,243	(10 )
Return on power program appropriation investment	(5 )	—	(6 )	—
Balance at end of year	8,282	(3,779 )	7,594	(3,771 )
Net proprietary capital at September 30	\$8,540	\$ 572	\$7,852	\$ 580

## Payments to the U.S. Treasury

TVA paid the U.S. Treasury \$5 million in 2017, \$6 million in 2016, and \$5 million in 2015 as a return on the Power Program Appropriation Investment. The amount of the return on the Power Program Appropriation Investment is based on the Power Program Appropriation Investment balance at the beginning of that year and the computed average interest rate payable by the U.S. Treasury on its total marketable public obligations at the same date. The interest rates payable by TVA on the Power Program Appropriation Investment were 2.00 percent, 2.04 percent, and 2.04 percent for 2017, 2016, and 2015, respectively.

## Accumulated Other Comprehensive Income (Loss)

The items included in AOCI consist of market valuation adjustments for certain derivative instruments. See Note 15.

TVA records exchange rate gains and losses on debt in net income and marks its currency swap assets and liabilities to market through OCI. TVA had unrealized gains (losses) of \$59 million and \$(139) million in 2017 and 2016, respectively, on the mark-to-market of currency swaps. TVA then reclassifies an amount out of AOCI into net income, offsetting the gain/loss from recording the exchange gain/loss on the debt. The amounts reclassified from OCI into net income resulted in increases (decreases) to net income of \$26 million, \$(129) million, and \$(65) million in 2017, 2016, and 2015, respectively. These reclassifications, coupled with the recording of the exchange gain/loss on the debt, did not have an impact on net income in 2017, 2016, and 2015. Based on forecasted foreign currency exchange rates, TVA expects to reclassify approximately \$18 million of losses from AOCI to interest expense within the next twelve months to offset amounts anticipated to be recorded in interest expense related to exchange gain on the debt.

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## 18. Other Income (Expense), Net

Income and expenses not related to TVA's operating activities are summarized in the following table:

Other Income (Expense), Net

For the years ended September 30

	2017	2016	2015
Interest income	\$ 23	\$ 24	\$24
External services	14	12	12
Gains (losses) on investments	9	7	(1 )
Miscellaneous	10	—	(6 )
Total other income (expense), net	\$ 56	\$ 43	\$29

## 19. Supplemental Cash Flow Information

Interest paid was \$1.3 billion for 2017, 2016, and 2015. These amounts differ from interest expense due to the timing of payments and interest capitalized of \$235 million in 2016 and \$214 million in 2015 as a part of major capital expenditures.

Construction in progress and Nuclear fuel expenditures included in Accounts payable and accrued liabilities at September 30, 2017, 2016, and 2015 were \$425 million, \$526 million, and \$530 million, respectively, and are excluded from the Statements of Consolidated Cash Flows for the years ended September 30, 2017, 2016, and 2015 as non-cash investing activities.

Excluded from the Statement of Consolidated Cash Flows for the years ended September 30, 2017, 2016, and 2015 as non-cash financing activities were capital lease obligations incurred related to purchase power assets of \$10 million, \$81 million, and less than \$1 million, respectively. Also excluded from the Statement of Consolidated Cash Flows for the years ended September 30, 2017 and 2016 were \$74 million and \$78 million, respectively, of notes payable related to TVA's acquisition of equity interests in certain SPEs. See Note 9.

Cash flows from futures contracts, forward contracts, option contracts, and swap contracts that are accounted for as hedges are classified in the same category as the item being hedged or on a basis consistent with the nature of the instrument.

## 20. Benefit Plans

TVA sponsors a qualified defined benefit plan ("pension plan") that covers most of its full-time employees hired prior to July 1, 2014, a qualified defined contribution plan ("401(k) plan") that covers most of its full-time employees, two unfunded post-retirement health care plans that provide for non-vested contributions toward the cost of eligible retirees' medical coverage, other postemployment benefits such as workers' compensation, and the SERP. The pension plan and the 401(k) plan are administered by a separate legal entity, the TVA Retirement System ("TVARS"), which is governed by its own board of directors (the "TVARS Board").

## Overview of Plans and Benefits

Retirement Plans. The participants in the pension plan receive either a traditional final average pay pension or a cash balance pension. The traditional pension benefit is based on the participant's creditable service, average monthly salary for their highest three consecutive years of eligible compensation, and a pension factor based on the participant's age and years of service, less a Social Security offset. The cash balance pension benefit is based on pay and interest credits accumulated in the participant's account and the participant's age.

Participants in the pension plan are also eligible to receive 401(k) plan matching contributions and may also be eligible to make after-tax contributions of up to \$10,000 per year to TVARS, which at the election of the participant are invested in either the fixed fund, which receives a fixed interest rate set forth in the plan, or the variable fund, which receives a rate of return based on an S&P 500 index fund. Participants in the pension plan may also become eligible for a supplemental pension benefit based on age and years of service at retirement, which is provided to help offset the cost of retiree medical insurance. Employees first hired on or after July 1, 2014, are participants in the 401(k) plan only and receive both nonelective and matching contributions to their accounts in the 401(k) plan.

On August 8, 2016, the TVARS Board approved amendments to the pension plan and the 401(k) plan, and these amendments were also approved by the TVA Board on August 25, 2016. The amendments, which became effective on October 1, 2016, changed future retirement benefits for employees and retirees and made certain other changes regarding TVA's minimum funding requirements to the pension plan and plan governance. With respect to current cash balance participants in the pension plan, these amendments shift future benefit accruals from the cash balance pension to the 401(k) plan based on hire date and years of service as of October 1, 2016. For cash balance participants first hired on or after January 1, 1996, and



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having more than 10 years of service as of October 1, 2016, participants will begin receiving nonelective contributions to their accounts in the 401(k) plan and reduced pay credits to their cash balance accounts in the pension plan. For cash balance participants first hired on or after January 1, 1996, and having less than 10 years of service as of October 1, 2016, participants will begin receiving nonelective contributions and higher matching contributions to their accounts in the 401(k) plan and will no longer receive pay credits to their cash balance accounts; however, their cash balance accounts will continue to receive interest credits.

The amendments also made the following additional benefit changes: reducing the future cash balance interest crediting rate and the fixed fund interest rate with a floor and ceiling based on the assumed rate of investment return on TVARS assets; closing the fixed and variable funds to new contributions from pension plan participants first hired on or after January 1, 1996; reducing the rate of future cost-of-living-adjustments ("COLAs") while increasing the maximum eligible COLA; vesting COLAs; increasing the eligibility age for COLAs for pension plan participants under age 50; restricting COLAs to pension amounts based on compensation up to Executive Level IV; eliminating future COLAs to SERP participants with less than 10 years of service; and capping the maximum supplemental benefit amounts.

The amendments also changed the annual minimum contribution required by TVA to the pension plan to the greater of (a) the minimum contribution calculated by TVARS's actuary according to the TVARS Rules and Regulations, or (b) \$300 million, for a period of 20 years (from 2017 through 2036) or, if earlier, through the fiscal year in which the plan reaches and remains at a 100 percent funded status under the actuarial rules applicable to TVARS.

**401(k) Plan Contributions.** TVA made non-elective and matching contributions to the 401(k) plan of approximately \$80 million during 2017, \$38 million during 2016, and \$36 million during 2015.

**Supplemental Executive Retirement Plan.** TVA has established a SERP for certain executives in critical positions to provide supplemental pension benefits tied to compensation that exceeds limits imposed by IRS rules applicable to the qualified defined benefit pension plan.

**Other Post-Retirement Benefits.** TVA sponsors two unfunded post-retirement benefit plans that provide for non-vested contributions toward the cost of certain eligible retirees' medical coverage. The first plan covers only certain retirees and surviving dependents who do not qualify for TVARS benefits, including the supplemental pension benefit. The second plan is designed to place a limit on the out-of-pocket amount certain eligible retirees pay for medical coverage and provides a credit based on years of TVA service and monthly base pension amount, reduced by any TVARS supplemental pension benefits or any TVA contribution from the first plan, described above. Effective January 2017, all Medicare-eligible retirees and spouses were provided Medicare coverage through a private exchange. Transition to the exchange does not affect any supplemental benefits for eligible retirees, and the credit will continue to be calculated in the same manner as before.

**Other Post-Employment Benefits.** TVA employees injured in work-related incidents are covered by the workers' compensation program for federal employees administered through the Department of Labor by the Office of Workers' Compensation Programs in accordance with the provisions of Federal Employees' Compensation Act ("FECA"). FECA provides compensation and medical benefits to federal employees for permanent and temporary disability due to employment-related injury or disease.

## Accounting Mechanisms

**Regulatory Accounting.** TVA has classified all amounts related to unrecognized prior service costs, net actuarial gains or losses, and the funded status as regulatory assets or liabilities as such amounts are probable of collection in future rates. Additionally, on October 1, 2014, TVA began recognizing pension costs as regulatory assets or liabilities

to the extent that the amount calculated under GAAP as pension expense differs from the amount TVA contributes to the pension plan.

**Cost Method.** TVA uses the projected unit credit cost method to determine the service cost and the projected benefit obligation for retirement, termination, and ancillary benefits. Under this method, a “projected accrued benefit” is calculated at the beginning of the year and at the end of the year for each benefit that may be payable in the future. The “projected accrued benefit” is based on the plan’s accrual formula and upon service at the beginning or end of the year, but it uses final average compensation, social security benefits, and other relevant factors projected to the age at which the employee is assumed to leave active service. The projected benefit obligation is the actuarial present value of the “projected accrued benefits” at the beginning of the year for employed participants and is the actuarial present value of all benefits for other participants. The service cost is the actuarial present value of the difference between the “projected accrued benefits” at the beginning and end of the year.

**Amortization of Net Gain or Loss.** TVA utilizes the corridor approach for gain/loss amortization. Differences between actuarial assumptions and actual plan results are deferred and amortized into periodic cost only when the accumulated differences exceed 10 percent of the greater of the projected benefit obligation or the market-related value of plan assets. If necessary, the excess is amortized over the average remaining service period of participating employees expected to receive benefits under the plan, which is currently 10 years and will continue to decline since no new participants will be added to the plan.

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Amortization of Prior Service Cost/(Credit). Amortization of net prior service cost/(credit) resulting from a plan change is included as a component of period expense in the year first recognized and every year thereafter until it is fully amortized. The increase or decrease in the benefit obligation due to the plan change is amortized over the average remaining service period of participating employees expected to receive benefits under the plan. The pension and post-retirement plans have prior service credits related to plan changes made in 2009, 2010, and 2016 with remaining amortization periods of three to ten years. However, when a plan change reduces the benefit obligation, existing positive prior service costs are reduced or eliminated starting with the earliest established before a new prior service credit base is established.

Asset Method. TVA recognizes the impact of asset performance on pension expense over a three-year phase-in period through a “market-related” value of assets calculation. Since the “market-related” value of assets recognizes investment gains and losses over a three-year period, the future value of assets will be impacted as previously deferred gains or losses are recognized. The “market-related” value is used in calculating expected return on plan assets and net gain or loss for pension cost determination.

## Obligations and Funded Status

The changes in plan obligations, assets, and funded status for the years ended September 30, 2017 and 2016, were as follows:

## Obligations and Funded Status

For the years ended September 30

	Pension Benefits		Other Post-Retirement Benefits	
	2017	2016	2017	2016
Change in benefit obligation				
Benefit obligation at beginning of year	\$ 13,083	\$ 12,824	\$ 571	\$ 657
Service cost	60	133	18	16
Interest cost	464	564	21	29
Plan participants' contributions	9	25	—	—
Collections <sup>(1)</sup>	—	—	47	92
Actuarial (gain) loss	(286 )	1,188	(80 )	68
Plan change	—	(960 )	—	(158 )
Net transfers (to) from variable fund/401(k) plan	(12 )	7	—	—
Expenses paid	(5 )	(6 )	—	—
Benefits paid	(712 )	(692 )	(83 )	(133 )
Benefit obligation at end of year	12,601	13,083	494	571
Change in plan assets				
Fair value of net plan assets at beginning of year	7,145	6,797	—	—
Actual return on plan assets	759	733	—	—
Plan participants' contributions	9	25	—	—
Collections <sup>(1)</sup>	—	—	47	92
Net transfers (to) from variable fund/401(k) plan	(12 )	7	—	—
Employer contributions <sup>(2)</sup>	805	281	36	41
Expenses paid	(5 )	(6 )	—	—
Benefits paid	(712 )	(692 )	(83 )	(133 )
Fair value of net plan assets at end of year	7,989	7,145	—	—
Funded status	\$(4,612 )	\$(5,938 )	\$(494 )	\$(571 )

Notes

(1) Collections include retiree contributions as well as federal reinsurance payments and provider discounts and rebates.

(2) Other Post-Retirement Benefits Employer contributions are reduced by federal reinsurance payments and provider discounts and rebates.

The pension actuarial gain for 2017 primarily reflects the impact of the increase in the discount rate from 3.65 percent to 3.85 percent, which decreased the liability by \$292 million. In addition, gains of \$117 million were due to mortality assumption changes. These gains were partially offset by a \$119 million loss related to a change in the assumption of participants' benefit payment elections, based on recent plan experience.

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The 2016 pension plan change was a result of the amendments to the TVA qualified defined benefit pension plan described above, which reduced the projected benefit obligation by \$960 million and established an additional unrecognized prior service credit at September 30, 2016 to be amortized for approximately 11 years as a component of net periodic pension benefit cost.

The \$1.2 billion pension actuarial loss for 2016 was primarily due to the decrease in the discount rate from 4.50 percent to 3.65 percent, which increased the projected benefit obligation by \$1.4 billion. This loss was partially offset by assumption changes for the COLA of \$168 million and for mortality of \$133 million to better reflect anticipated future plan experience.

The other post-retirement actuarial gain for 2017 was primarily due to lower per capita costs, which decreased the liability by \$66 million. In addition, gains of \$18 million were due to an increase in the discount rate from 3.70 percent to 3.95 percent, and gains of \$6 million resulted from the updated mortality assumption. These gains were slightly offset by a change in the pre-Medicare trend rate, primarily driven by recent increases in prescription drug costs.

The 2016 post-retirement plan change was a result of transitioning all Medicare eligible retirees and spouses to a private exchange effective January 2017, which reduced the projected benefit obligation by \$158 million.

The other post-retirement actuarial loss for 2016 was primarily due to the decrease in the discount rate from 4.65 percent to 3.70 percent, which increased the liability by \$91 million. The loss was partially offset by a gain of \$17 million due to demographic experience related to updated per capita costs and retiree contributions, and a gain of \$7 million related to assumption changes for mortality to better reflect anticipated future plan experience.

Amounts related to these benefit plans recognized on TVA's consolidated balance sheets consist of regulatory assets that have not been recognized as components of net periodic benefit cost at September 30, 2017 and 2016, and the funded status of TVA's benefit plans, which are included in Accounts payable and accrued liabilities and Post-retirement and post-employment benefit obligations:

Amounts Recognized on TVA's Consolidated Balance Sheets  
At September 30

	Pension Benefits		Other Post-Retirement Benefits	
	2017	2016	2017	2016
Regulatory assets (liabilities)	\$4,009	\$5,336	\$ (23 )	\$ 49
Accounts payable and accrued liabilities	(4 )	(5 )	(33 )	(35 )
Pension and post-retirement benefit obligations <sup>(1)</sup>	(4,608 )	(5,933 )	(461 )	(536 )

Note

(1) The table above excludes \$408 million and \$460 million of post-employment benefit costs that are recorded in Post-retirement and post-employment benefit obligations on the Consolidated Balance Sheets at September 30, 2017 and 2016, respectively.

Unrecognized amounts included in regulatory assets or liabilities yet to be recognized as components of accrued benefit cost at September 30 consisted of:

Post-Retirement Benefit Costs Deferred as Regulatory Assets  
At September 30

	Pension Benefits	Other Post-Retirement Benefits
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	2017	2016	2017	2016
Unrecognized prior service credit	\$(918 )	\$(1,017)	\$(163 )	\$(185 )
Unrecognized net loss	4,885	5,946	140	234
Amount capitalized due to actions of regulator	42	407	—	—
Total regulatory assets	\$4,009	\$5,336	\$(23 )	\$49

The projected benefit obligation, accumulated benefit obligation, and fair value of plan assets for the pension plan at September 30, 2017, and 2016, were as follows:

Projected Benefit Obligations and Accumulated  
Benefit Obligations in Excess of Plan Assets

At September 30

	2017	2016
Projected benefit obligation	\$12,601	\$13,083
Accumulated benefit obligation	12,461	12,912
Fair value of net plan assets	7,989	7,145

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The components of net periodic benefit cost and other amounts recognized as changes in regulatory assets for the years ended September 30, 2017, and 2016, were as follows:

## Components of Net Periodic Benefit Cost

For the years ended September 30

	Pension Benefits			Other Post-Retirement Benefits		
	2017	2016	2015	2017	2016	2015
Service cost	\$60	\$133	\$130	\$18	\$16	\$16
Interest cost	464	564	540	21	29	29
Expected return on plan assets	(457 )	(446 )	(437 )	—	—	—
Amortization of prior service credit	(99 )	(23 )	(21 )	(22 )	(6 )	(6 )
Recognized net actuarial loss	472	310	299	14	7	9
Curtailment	—	(78 )	—	—	—	—
Total net periodic benefit cost as actuarially determined	440	460	511	31	46	48
Amount expensed (capitalized) due to actions of regulator	365	(179 )	(228 )	—	—	—
Total net period benefit cost	\$805	\$281	\$283	\$31	\$46	\$48

The amounts in the regulatory asset that are expected to be recognized as components of net periodic benefit cost during the next fiscal year are as follows:

## Expected Amortization of Regulatory Assets in 2018

At September 30, 2017

	Pension Benefits	Other Post-Retirement Benefits	Total
Prior service credit	\$ (98 )	\$ (22 )	\$ (120)
Net actuarial loss	412	7	419

The amount in the components of net periodic benefit cost expected to be capitalized due to actions of the regulator in the next fiscal year is \$57 million.

## Plan Assumptions

TVA's reported costs of providing the plan benefits are impacted by numerous factors including the provisions of the plans, changing employee demographics, and various assumptions, the most significant of which are noted below.

## Actuarial Assumptions Utilized to Determine Benefit Obligations at September 30

	Pension Benefits		Other Post-Retirement Benefits	
	2017	2016	2017	2016
Discount rate	3.85 %	3.65 %	3.95 %	3.70 %
Rate of compensation increase	5.43 %	5.55 %	N/A	N/A
Pre-Medicare eligible				
Initial health care cost trend rate	N/A	N/A	6.50 %	6.50 %
Ultimate health care cost trend rate	N/A	N/A	5.00 %	5.00 %
Year ultimate trend rate is reached	N/A	N/A	2024	2019
Post-Medicare eligible				
Initial health care cost trend rate	N/A	N/A	— %	— %

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Ultimate health care cost trend rate	N/A	N/A	4.00 %	4.00 %
Year ultimate trend rate is reached	N/A	N/A	2021	2021

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	Pension Benefits			Other Post-Retirement Benefits		
	2017	2016	2015	2017	2016	2015
Discount rate	3.65 %	4.50 %	4.45 %	3.70 %	4.65 %	4.50 %
Expected return on plan assets	7.00 %	7.00 %	7.00 %	N/A	N/A	N/A
Rate of compensation increase	5.55 %	5.70 %	5.70 %	N/A	N/A	N/A
Pre-Medicare eligible						
Initial health care cost trend rate	N/A	N/A	N/A	6.50 %	7.00 %	7.50 %
Ultimate health care cost trend rate	N/A	N/A	N/A	5.00 %	5.00 %	5.00 %
Year ultimate trend rate is reached	N/A	N/A	N/A	2019	2019	2019
Post-Medicare eligible						
Initial health care cost trend rate	N/A	N/A	N/A	— %	7.00 %	7.50 %
Ultimate health care cost trend rate	N/A	N/A	N/A	4.00 %	5.00 %	5.00 %
Year ultimate trend rate is reached	N/A	N/A	N/A	2021	2019	2019

## Note

(1) The actuarial assumptions used to determine the benefit obligations at September 30 of each year are subsequently used to determine net periodic benefit cost for the following year.

**Discount Rate.** In selecting the assumed discount rate, TVA reviews market yields on high-quality corporate debt and long-term obligations of the U.S. Treasury and endeavors to match, through the use of a hypothetical bond portfolio, instrument maturities with the maturities of its pension obligations in accordance with the prevailing accounting standards. The selected bond portfolio is derived from a universe of high quality corporate bonds of Aa-rated quality or higher. After the bond portfolio is selected, a single interest rate is determined that equates the present value of the plan's projected benefit payments discounted at this rate with the market value of the bonds selected. Based on recent market trends and economic conditions, TVA increased its discount rate used to determine the pension benefit obligation and other post-retirement benefit obligation.

**Rate of Return.** The qualified defined benefit pension plan is the only plan that is funded with qualified plan assets. In determining the expected long-term rate of return on pension plan assets, TVA uses a process that incorporates actual historical asset class returns and an assessment of expected future performance and takes into consideration external actuarial advice, the current outlook on capital markets, the asset allocation policy, and the anticipated impact of active management. Asset allocations are periodically updated using the pension plan asset/liability studies and are part of the determination of the estimates of long-term rates of return. The current asset allocation policy approved by the TVARS Board diversifies plan assets across multiple asset classes so as to minimize the risk of large losses. The asset allocation policy is designed to be dynamic in nature and responsive to changes in the funded status of TVARS. Changes in the expected return rates are based on annual studies performed by third party professional investment consultants. In 2017, upon review of the changes in the plan's asset target allocation mix, capital market outlooks, and the most recent studies, TVA management adopted a 6.75 percent expected long-term return on plan assets which will be used to calculate the 2018 net periodic pension cost.

**Compensation Increases.** Assumptions related to compensation increases are based on the results obtained from an actual company experience study performed during the most recent five years for plan participants. TVA obtained an updated study in 2013 and determined that future compensation would likely increase at rates between 3.50 percent and 13.00 percent per year, depending upon the employee's age. The average assumed compensation increase used to determine benefit obligations is based upon the current active participants.

Mortality. The mortality assumption is comprised of a base table that represents the current future expectation of life expectancy adjusted by an improvement scale to project future improvements in life expectancy. TVA's mortality assumptions are based upon actuarial projections in combination with studies of the actual mortality experience of TVA's pension and post-retirement plan participants while taking into consideration the published Society of Actuaries ("SOA") mortality table and projection scale at September 30. Based upon an updated review of mortality improvements, TVA adopted a modified version of the SOA MP-2016 improvement scale and maintained its adjusted version of the SOA RP-2014 mortality table to measure the pension and post-retirement benefit obligation at September 30, 2017.

The following mortality assumptions were used to determine the benefit obligations for the pension and other post-retirement benefit plans at September 30, 2017, 2016, and 2015. Assumptions used to determine year-end benefit obligations are the assumptions used to determine the subsequent year's net periodic benefit costs.

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Mortality Assumptions  
At September 30

	2017	2016	2015
Mortality table	RP-2014 table (adjusted)	RP-2014 table (adjusted)	RP-2014 table (adjusted)
Improvement scale	MP-2016 (modified)	RP-2015 scale (modified)	MP-2014 (modified)

Health Care Cost Trends. TVA reviews actual recent cost trends and projected future trends in establishing health care cost trend rates. In 2017, TVA reset the current trend rate assumption used to determine the pre-Medicare eligible post-retirement obligation to 6.50 percent with the assumption to gradually decrease each successive year until it reaches a 5.00 percent annual increase in health care costs in 2024 and beyond. TVA maintained the post-Medicare eligible health care cost trend assumption at 0.00 percent through 2020 at which point it increases to 4.00 percent in 2021 and beyond as a result of the move of Medicare eligible retirees to a private exchange beginning January 2017.

Cost of Living Adjustment. COLAs are an increase in the benefits for eligible retirees to help maintain the purchasing power of benefits as consumer prices increase. Eligible retirees receive a COLA on the base pension portion of the monthly pension benefit equal to the percentage change in the Consumer Price Index for All Urban Consumers (“CPI-U”) in January following any year in which the 12-month average CPI-U exceeded by as much as one percent the 12-month average of the CPI-U for the preceding year in which a COLA was given. Increases in the COLA will be the percent increase in CPI-U over the preceding year less 0.25 percent, with a 6.00 percent cap for any one year.

TVA's COLA assumption is derived from long-term expectations of the expected future rate of inflation, based upon capital market assumptions, economic forecasts, and the Federal Reserve policy. TVA’s 2017 COLA assumption remained at 2.00 percent for CY 2018 and thereafter to measure the benefit obligations. TVA’s 2016 COLA assumption was 1.25 percent for CY 2017 and 2.00 percent for CY 2018 and thereafter. The COLA assumption used to determine the benefit obligations at September 30 are used to determine the net periodic benefit costs for the following fiscal year adjusted for the actual COLA determined for the following calendar year. The actual 2017, 2016, and 2015 COLAs were 0.99 percent, 0.00 percent, and 1.68 percent, respectively. The assumed COLAs for 2018 and beyond are based on the underlying CPI assumption of 2.25 percent, less 0.25 percent. The actual 2018 COLA will not be determined until December 2017.

Sensitivity of Costs to Changes in Assumptions. The following chart reflects the sensitivity of pension cost to changes in certain actuarial assumptions:

Sensitivity to Certain Changes in Pension Assumptions  
At September 30, 2017

Actuarial Assumption	Change in Assumption	Impact on 2017 Pension Cost	Impact on 2017 Projected Benefit Obligation
Discount rate	(0.25 )%	\$ 17	\$ 367
Rate of return on plan assets	(0.25 )%	16	N/A

Each fluctuation above assumes that the other components of the calculation are held constant and excludes any impact for unamortized actuarial gains or losses.

The following chart reflects the sensitivity of post-retirement benefit cost to changes in the health care trend rate:  
Sensitivity to Changes in Assumed Health Care Cost Trend Rates

At September 30, 2017

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	1%	1%
	Increase	Decrease
Effect on total of service and interest cost components for the year	\$ 5	\$ (5 )
Effect on end-of-year accumulated post-retirement benefit obligation	70	(67 )

Each fluctuation above assumes that the other components of the calculation are held constant and excludes any impact for unamortized actuarial gains or losses.

#### Plan Investments

The qualified defined benefit pension plan (the "Plan"), which includes the Original Benefit Structure and the Cash Balance Benefit Structure, is the only plan that includes qualified plan assets.

The TVARS Board's current asset allocation policy for the investment of qualified pension plan assets has targets of 47 percent equity including global public and private equity investments, 30 percent fixed income securities, and 23 percent real assets including public and private real assets. TVARS has a long-term investment plan that contains a dynamic de-risking

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strategy which will allocate investments to assets that better match the liability, such as long duration fixed income securities, over time as improved funding status targets are met. Pursuant to the TVARS Rules and Regulations, any proposed changes in asset allocation that would change the system's assumed rate of investment return are subject to TVA's review and veto.

As set forth above, the qualified pension plan assets are invested across global public equity, private equity, safety oriented fixed income, opportunistic fixed income, public real assets, and private real assets. The TVARS asset allocation policy includes permissible deviations from target allocations. The TVARS Board can take action, as appropriate, to rebalance the system's assets consistent with the asset allocation policy. At September 30, 2017 and 2016, the asset holdings of the system included the following:

## Asset Holdings of TVARS

At September 30

Asset Category	Target Allocation	Plan Assets at September 30			
		2017	2016		
Global public equity	39 %	44 %	44 %		
Private equity	8 %	5 %	4 %		
Safety oriented fixed income	15 %	21 %	18 %		
Opportunistic fixed income	15 %	10 %	10 %		
Public real assets	15 %	13 %	15 %		
Private real assets	8 %	7 %	9 %		
Total	100 %	100 %	100 %		

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## Fair Value Measurements

The following table provides the fair value measurement amounts for assets held by TVARS at September 30, 2017:

TVA Retirement System

At September 30, 2017

	Total <sup>(1)</sup> (2)	Quoted Prices in Active Markets for Identical Assets/Liabilities (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
<b>Assets</b>				
Equity securities	\$1,771	\$ 1,770	\$ —	\$ 1
Preferred securities	14	3	11	—
<b>Debt securities</b>				
Corporate debt securities	1,100	—	1,088	12
Residential mortgage-backed securities	325	—	317	8
Debt securities issued by U.S. Treasury and other U.S. government agencies	193	193	—	—
Debt securities issued by foreign governments	331	—	307	24
Asset-backed securities	146	—	109	37
Debt securities issued by state/local governments	19	—	17	2
Commercial mortgage-backed securities	68	—	62	6
<b>Commingled funds measured at net asset value<sup>(3)</sup></b>				
Equity	1,134	—	—	—
Debt	709	—	—	—
Commodities	224	—	—	—
Institutional mutual funds	155	155	—	—
Cash equivalents and other short-term investments	916	—	916	—
Certificates of deposit	6	—	6	—
Private equity measured at net asset value <sup>(3)</sup>	500	—	—	—
Private real estate measured at net asset value <sup>(3)</sup>	533	—	—	—
Securities lending collateral	369	—	369	—
<b>Derivatives</b>				
Futures	18	18	—	—
Swaps	1	—	1	—
Foreign currency forward receivable	4	—	4	—
<b>Total assets</b>	<b>\$8,536</b>	<b>\$ 2,139</b>	<b>\$ 3,207</b>	<b>\$ 90</b>
<b>Liabilities</b>				
Futures	\$3	\$ 2	\$ —	\$ 1
Foreign currency forward payable	6	—	6	—

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Credit default swaps	1	—	—	1
Total liabilities	\$10	\$ 2	\$ 6	\$ 2

Notes

(1) Excludes approximately \$168 million in net payables associated with security purchases and sales and various other payables.

(2) Excludes a \$369 million payable for collateral on loaned securities in connection with TVARS's participation in securities lending programs.

(3) Certain investments that are measured at fair value using the net asset value per share (or its equivalent) practical expedient have not been classified in the fair value hierarchy.

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The following table provides the fair value measurement amounts for assets held by TVARS at September 30, 2016:  
TVA Retirement System  
At September 30, 2016

	Total <sup>(1)</sup> (2)	Quoted Prices in Active Markets for Identical Assets/Liabilities (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
<b>Assets</b>				
Equity securities	\$1,847	\$ 1,846	\$ —	\$ 1
Preferred securities	20	3	17	—
<b>Debt securities</b>				
Corporate debt securities	1,145	—	1,135	10
Residential mortgage-backed securities	181	—	165	16
Debt securities issued by U.S. Treasury and other U.S. government agencies	117	117	—	—
Debt securities issued by foreign governments	332	—	299	33
Asset-backed securities	118	—	87	31
Debt securities issued by state/local governments	16	—	16	—
Commercial mortgage-backed securities	44	—	38	6
<b>Commingled funds measured at net asset value<sup>(3)</sup></b>				
Equity	682	—	—	—
Debt	653	—	—	—
Commodities	302	—	—	—
Blended	225	—	—	—
Institutional mutual funds	10	10	—	—
Cash equivalents and other short-term investments	621	41	580	—
Certificates of deposit	16	—	16	—
Private equity measured at net asset value <sup>(3)</sup>	385	—	—	—
Private real estate measured at net asset value <sup>(3)</sup>	568	—	—	—
Securities lending collateral	3	—	3	—
<b>Derivatives</b>				
Futures	2	2	—	—
Swaps	1	—	1	—
Foreign currency forward receivable	5	—	5	—
<b>Total assets</b>	<b>\$7,293</b>	<b>\$ 2,019</b>	<b>\$ 2,362</b>	<b>\$ 97</b>
<b>Liabilities</b>				
Futures	\$2	\$ 2	\$ —	\$ —
Foreign currency forward payable	9	—	9	—
Written options	1	—	1	—



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Interest rate swaps	3	—	3	—
Credit default swaps	1	—	1	—
Total liabilities	\$16	\$ 2	\$ 14	\$ —

Notes

(1) Excludes approximately \$129 million in net payables associated with security purchases and sales and various other payables.

(2) Excludes a \$3 million payable for collateral on loaned securities in connection with TVARS's participation in securities lending programs.

(3) Certain investments that are measured at fair value using the net asset value per share (or its equivalent) practical expedient have not been classified in the fair value hierarchy.

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The following table provides a reconciliation of beginning and ending balances of pension plan assets measured at fair value on a recurring basis where the determination of fair value includes significant unobservable inputs (Level 3):

## Fair Value Measurements Using Significant Unobservable Inputs

	Fair Value Measurements Using Significant Unobservable Inputs (Level 3)
Balance at October 1, 2015	\$ 91
Net realized/unrealized gains (losses)	18
Purchases, sales, issuances, and settlements (net)	(12 )
Transfers in and/or out of Level 3	—
Balance at September 30, 2016	97
Net realized/unrealized gains (losses)	2
Purchases, sales, issuances, and settlements (net)	(6 )
Transfers in and/or out of Level 3	(5 )
Balance at September 30, 2017	\$ 88

The following descriptions of the valuation methods and assumptions used by the Plan to estimate the fair value of investments apply to investments held directly by the Plan. Third-party pricing vendors provide valuations for investments held by the Plan in most instances, except for commingled, private equity, and private real estate funds which are priced at net asset values established by the investment managers. In instances where pricing is determined to be based on unobservable inputs, a Level 3 classification has been assigned. Certain securities priced by the investment manager using proprietary fair value model with unobservable inputs have been classified as Level 3.

**Equity and Preferred Securities.** Investments listed on either a national or foreign securities exchange or traded in the over-the-counter National Market System are generally valued each business day at the official closing price (typically the last reported sale price) on the exchange on which the security is primarily traded and are classified as Level 1. Equity securities, including common stocks and preferred securities, classified as Level 2 may have been priced by dealer quote or using assumptions based on observable market data, such as yields on bonds from the same issuer or industry. Certain securities priced by the investment manager using unobservable inputs have been classified as Level 3.

**Corporate Debt Securities.** Corporate bonds are valued based upon recent bid prices or the average of recent bid and asked prices when available (Level 2 inputs) and, if not available, they are valued through matrix pricing models. Matrix pricing, which is a mathematical technique commonly used to price debt securities that are not actively traded, values debt securities without relying exclusively on quoted prices for the specific securities but rather by relying on the securities' relationship to other benchmark quoted securities (Level 2 inputs). Certain securities priced by the investment manager using broker pricing or unobservable inputs have been classified as Level 3.

**Mortgage and Asset-Backed Securities.** Residential mortgage-backed securities consist of collateralized mortgage obligations ("CMOs") and U.S. pass-through security pools related to government-sponsored enterprises ("GSEs"). CMO pricing is typically based on either a volatility-driven, multidimensional, single-cash-flow stream model or an option-adjusted spread model. These models incorporate available market data such as trade information, dealer quotes, market color, spreads, bids, and offers. Pricing for GSE securities, including the Federal Home Loan Mortgage Corporation, the Federal National Mortgage Association, and the Government National Mortgage Association, is typically based on quotes from the To Be Announced ("TBA") market, which is highly liquid with multiple electronic

platforms that facilitate the execution of trading between investors and broker/dealers. Prices from the TBA market are then compared against other live data feeds as well as input obtained directly from the dealer community. Most residential mortgage-backed securities are considered to be priced using Level 2 inputs because of the nature of their market-data-based pricing models. Certain securities priced by vendor using a single broker quote or unobservable inputs have been classified as Level 3.

Commercial mortgage-backed and asset-backed securities are typically priced based on a single-cash-flow stream model, which incorporates available market data such as trade information, dealer quotes, market color, spreads, bids, and offers. Because of the market-data-based nature of such pricing models, these securities are typically classified as Level 2. Certain securities priced by investment manager using broker pricing, or unobservable inputs have been classified as Level 3.

Debt Securities Issued by U.S. Treasury and Other U.S. Government Agencies. For U.S. Treasury securities, fair values reflect the closing price reported in the active market in which the security is traded (Level 1 inputs). Agency securities are typically priced using evaluated pricing applications and models incorporating U.S. Treasury yield curves. Agency securities are classified as Level 2 because of the nature of their market-data-based pricing models.

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Debt Securities Issued by State and Local Governments. Debt securities issued by state and local governments are typically priced using market-data-based pricing models, and are therefore classified as Level 2. These pricing models incorporate market data such as quotes, trading levels, spread relationships, and yield curves, as applicable. Certain securities priced using an unobservable input have been classified as Level 3.

Debt Securities Issued by Foreign Governments. Foreign government bonds and foreign government inflation-linked securities are typically priced based on proprietary discounted cash flow models, incorporating option-adjusted spread features as appropriate. Debt securities issued by foreign governments are classified as Level 2 because of the nature of their market-data-based pricing models. Certain securities priced by the investment manager using broker quote or unobservable input have been classified as Level 3.

Private Equity Funds. Private equity limited partnerships are reported at net asset values provided by the fund managers. These funds have not been classified in the fair value hierarchy in accordance with FASB guidance issued in May 2015.

The private equity limited partnerships typically make longer-term investments in private companies and seek to obtain financial returns through long-term appreciation based on corporate stewardship, improved operating processes, and financial restructuring which may involve a merger or acquisition. Significant investment strategies include venture capital; buyout; mezzanine, or subordinated debt; restructuring or distressed debt; and special situations. Venture capital partnerships consist of two main groupings. Early-stage venture capital partnerships invest in businesses still in the conceptual stage where products may not be fully developed and where revenues and/or profits may be several years away. Later-stage venture capital partnerships invest in more mature companies in need of growth or expansion capital. Buyout partnerships provide the equity capital for acquisition transactions either from a private seller or the public, which may represent the purchase of the entire company or a refinancing or recapitalization transaction where equity is invested. Mezzanine or subordinated debt partnerships provide the intermediate capital between equity and senior debt in a buyout or refinancing transaction and typically own a security in the company that carries current interest payments as well as a potential equity interest in the company. Restructuring or distressed debt partnerships purchase opportunities generated by overleveraged or poorly managed companies. Special situation partnerships include organizations with a specific industry focus not covered by the other private equity subclasses or unique opportunities that fall outside the regular subclasses.

The private equity funds have no investment withdrawal provisions prior to the termination of the partnership. Partnerships generally continue 10 to 12 years after the inception of the fund. The partnerships are subject to two to three one-year extensions at the discretion of the General Partner. Partnerships can generally be dissolved by an 80 percent vote in interest by all limited partners, with some funds requiring the occurrence of a specific event.

Private Real Estate Investments. The Plan's ownership in private real estate investments consists of a pro rata share and not a direct ownership of the underlying investments. The fair values of the Plan's private real estate investments are estimated utilizing net asset values provided by the investment managers. These investments have not been classified in the fair value hierarchy in accordance with FASB guidance issued in May 2015. The investment strategies and methodologies utilized by the investment managers to calculate their net asset values are summarized as follows:

The Plan is invested in limited partnerships that invest in real estate securities, real estate partnerships, and direct real estate properties. This includes investments in office, multifamily, industrial, and retail investment properties in the U.S. and international markets. The investment strategy focuses on distressed, opportunistic, and value-added opportunities. Partnership investments also include mortgage and/or real estate-related fixed-income instruments and related securities. Investments are diversified by property type and geographic location.

The Plan is invested in a commingled fund that develops, renovates, and re-leases real estate properties to create value. Investments are predominantly in top tier real estate markets that offer deep liquidity. Property types include residential, office, industrial, hotel, retail, and land. Properties are diversified by geographic region within the U.S. domestic market. The Plan is invested in a second commingled fund that invests primarily in core, well-leased, operating real estate properties with a focus on income generation. Investments are diversified by property type with a focus on office, industrial, apartment, and retail. Properties are diversified within the U.S. with an overweight to major market and coastal regions.

Fair value estimates of the underlying investments in these limited partnerships and commingled fund investments are primarily based upon property appraisal reports prepared by independent real estate appraisers within a reasonable amount of time following acquisition of the real estate and no less frequently than annually thereafter. The appraisals are based on one or a combination of three methodologies: cost of reproduction analysis, discounted cash flow analysis, and sales comparison analysis. Pricing for certain investments in mortgage-backed and asset-backed securities is typically based on models that incorporate observable inputs.

The Plan is invested in a private real estate investment trust formed to make direct or indirect investments in commercial timberland properties. Pricing for these types of investments is based on comprehensive appraisals that are conducted shortly after initial purchase of properties and at three-year intervals thereafter. All appraisals are conducted by third-party timberland appraisal firms. Appraisals are based on either a sales comparison analysis or a discounted cash flow analysis.

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Derivatives. The Plan invests in a variety of derivative instruments. The valuation methodologies for these instruments are as follows:

Futures. The Plan enters into futures. The futures contracts are listed on either a national or foreign securities exchange and are generally valued each business day at the official closing price (typically the last reported sales price) on the exchange on which the security is primarily traded. The pricing is performed by third-party vendors. Since futures are priced by an exchange in an active market, they are classified as Level 1. Certain securities priced using a stale vendor price have been classified as Level 3.

Options. The Plan enters into purchased and written options. Options that are listed on either a national or foreign securities exchange are generally valued each business day at the official closing price (typically the last reported sales price) on the exchange on which the security is primarily traded. These options are classified as Level 1. Options traded over the counter and not on exchanges are priced by third-party vendors and are classified as Level 2.

Swaps. The Plan enters into various types of swaps. Credit default swaps are priced at market using models that consider cash flows, credit curves, recovery rates, and other factors. The pricing is performed by third-party vendors, and in some cases by clearing exchanges. Interest rate swap contracts are priced at market using forward rates derived from the swap curve, and the pricing is also performed by third-party vendors, and in some cases by clearing exchanges. Other swaps such as equity index swaps and variance swaps are priced by third-party vendors using market inputs such as spot rates, yield curves, and volatility. The Plan's swaps are generally classified as Level 2 based on the observable nature of their pricing inputs.

Foreign currency forwards. The Plan enters into foreign currency forwards. All commitments are marked to market daily at the applicable translation rates, and any resulting unrealized gains or losses are recorded. Foreign currency forwards are priced by third-party vendors and are classified as Level 2.

Commingled Funds. The Plan invests in commingled funds, which include collective trusts, unit investment trusts, and similar investment funds that predominantly hold debt and/or equity securities as underlying assets. The Plan's ownership consists of a pro rata share and not a direct ownership of an underlying investment. These commingled funds are valued at their closing net asset values (or unit value) per share as reported by the managers of the commingled funds and as supported by the unit prices of actual purchases and sale transactions occurring as of or close to the financial statement date. These funds have not been classified in the fair value hierarchy in accordance with FASB guidance issued in May 2015.

The Plan is invested in equity commingled funds, which can be categorized as either passively managed index funds or actively managed funds. The equity index funds seek to track the performance of a particular index by replicating its capitalization and characteristics. Passive fund benchmark indices include the Russell 1000 index, the S&P 500 index, the MSCI ACWI ex-U.S. index, the MSCI ACWI ex-U.S. Small-Cap index, and the Dow Jones U.S. Select REIT Index. The actively managed equity funds seek to outperform certain equity benchmarks through a combination of fundamental and technical analysis. Active funds select portfolio positions based upon their research.

The Plan is invested in debt commingled funds, which can be categorized as either passively managed index funds or actively managed funds. The Plan's debt index fund invests in a diversified portfolio of fixed-income securities and derivatives of varying maturities to replicate the characteristics of the Bloomberg Barclays Capital U.S. Treasury Inflation-Protected Securities ("TIPS") index. The fund seeks to track the total return of the Bloomberg Barclays Capital U.S. TIPS index. The actively managed debt funds seek to outperform certain fixed-income benchmarks through fundamental research and analysis. The funds invest in a diversified portfolio of fixed income securities and derivatives of varying maturities. The objective is to achieve a positive relative total return through active credit selection.

The Plan is invested in commodity commingled funds, which can be categorized as actively managed funds. The funds seek to outperform certain commodity benchmarks through fundamental research and analysis. The funds invest in a diversified portfolio of commodity securities and derivatives of varying maturities. The objective is to achieve a positive relative return through active security selection.

The Plan is invested in commingled funds, which invest across multiple asset classes that can be categorized as blended. These funds seek to outperform a passive benchmark through active security selection. The funds invest in securities across equity, fixed income, currency, and commodities. The portfolios employ fundamental, quantitative, and technical analysis.

The Plan's investments in equity, debt, blended, and commodity commingled funds can generally be redeemed upon notification of the investment managers, with required notice periods varying from same-day to monthly. These investments do not have unfunded commitments.

**Institutional Mutual Funds.** Investments in institutional mutual funds are valued at prices based on their net asset value. Institutional mutual funds have daily published market prices that represent their net asset value (or unit value) per share and are classified as Level 1.

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Cash Equivalents and Other Short-Term Investments and Certificates of Deposit. Cash equivalents and other short-term investments are highly liquid securities with maturities of less than three months and 12 months, respectively. These consist primarily of discount securities such as commercial paper, repurchase agreements, U.S. Treasury bills, and certain agency securities. These securities, as well as certificates of deposit, may be priced at cost, which approximates fair value due to the short-term nature of the instruments. Model based pricing which incorporates observable inputs may also be utilized. These securities are classified as Level 2. Active market pricing may be utilized for U.S. Treasury bills, which are classified as Level 1.

Securities Lending Collateral. Collateral held under securities lending arrangements are invested in highly liquid short-term securities, primarily repurchase agreements. The securities are often priced at cost, which approximates fair value due to the short-term nature of the instruments. These securities are classified as Level 2.

The valuation methods described above may produce a fair value calculation that may not be indicative of net realizable value or reflective of future fair values. Furthermore, while the Plan believes its valuation methods are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different fair value measurement at the reporting date.

Reclassification. In the September 30, 2016, fair value measurement table, securities lending collateral has been reclassified into Level 2. The collateral is invested in highly liquid short-term securities, primarily repurchase agreements priced at cost, which approximates fair value due to the short-term nature of the instruments.

## Cash Flows

Estimated Future Benefit Payments. The following table sets forth the estimated future benefit payments under the benefit plans.

Estimated Future Benefits Payments  
At September 30, 2017

	Pension Benefits <sup>(1)</sup>	Other Post-Retirement Benefits
2018	\$ 768	\$ 33
2019	769	31
2020	773	29
2021	774	27
2022	774	25
2023 - 2027	3,821	115

## Note

(1) Participants are assumed to receive the Fixed Fund in a lump sum in lieu of available annuity options allowed for certain grandfathered participants resulting in higher estimated pension benefits payments.

Contributions. The minimum contribution for 2017 was \$300 million; however, TVA made a \$800 million contribution to TVARS in 2017. The 2016 minimum contribution was \$209 million; however, TVA made a \$275 million contribution to TVARS in 2016. In 2017, TVA made contributions of \$5 million to the SERP and \$30 million, net of rebates and subsidies received, to the other post-retirement benefit plans. In 2016, TVA made contributions of \$6 million to the SERP and \$47 million, net of rebates and subsidies received, to the other post-retirement benefit plans. TVA expects to contribute \$300 million to TVARS, \$4 million to the SERP, and \$33 million to the other post-retirement benefit plans in 2018.



### Other Post-Employment Benefits

Post-employment benefit cost estimates are revised to properly reflect changes in actuarial assumptions made at the end of each year. TVA utilizes a discount rate determined by reference to the U.S. Treasury Constant Maturities corresponding to calculated average durations of TVA's future estimated post-employment claims payments. The use of a 2.33 percent discount rate resulted in the recognition of approximately \$(12) million in expenses in 2017 and an unpaid benefit obligation of \$447 million at September 30, 2017. The use of a 1.60 percent discount rate resulted in the recognition of approximately \$35 million in expenses in 2016 and an unpaid benefit obligation of \$501 million at September 30, 2016. The use of a 2.05 percent discount rate resulted in the recognition of approximately \$39 million in expenses in 2015 and an unpaid benefit obligation of \$511 million at September 30, 2015.

The decrease in the unpaid benefit obligation when comparing 2017 to 2016 is due primarily to the increase of the discount rate from 1.60 percent in 2016 to 2.33 percent in 2017. The decrease in the unpaid benefit obligation when comparing 2016 to 2015 was due primarily to demographic experience gains from a decrease in loss experience and fewer claimants. These gains were partially offset by the decrease of the discount rate from 2.05 percent in 2015 to 1.60 percent in 2016.

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Amounts related to other post-employment benefit obligations are recognized on TVA's consolidated balance sheets. The current portion which represents unpaid losses and administrative fees due are in Accounts payable and accrued liabilities. The long-term portion is recognized in Post-retirement and post-employment benefit obligations.

Amounts Recognized on TVA's Consolidated

Balance Sheets

At September 30

	2017	2016
Accounts payable and accrued liabilities	\$ 39	\$ 41
Post-employment benefit obligations	408	460

21. Commitments and Contingencies

Commitments

**Power Purchase Obligations.** TVA has contracted with various independent power producers and LPCs for additional capacity to be made available to TVA. Several of these agreements have contractual minimum payments and are accounted for as either capital or operating leases. In total, these agreements provide 2,230 MW of summer net capability. The remaining terms of the agreements range up to fifteen years. Additionally, TVA has contracted with regional transmission organizations to reserve 1,450 MW of transmission service to support purchases from the market and wind power purchase agreements. The remaining terms of these agreements range up to fifteen years. TVA incurred \$178 million, \$218 million, and \$218 million of expense under these power purchase and transmission service agreements during 2017, 2016, and 2015, respectively. Lease-related costs under TVA's power purchase agreements not accounted for as capital leases are included in TVA's consolidated statements of operations as purchased power expense and are expensed as incurred.

Under federal law, TVA is obligated to purchase power from qualifying facilities (cogenerators and small power producers). As of September 30, 2017, there was a combined qualifying facility capacity of 258 MW from 30 different generation sources, from which TVA purchased power under this law.

**Membership Interests of VIE Subject to Mandatory Redemption.** At September 30, 2017, TVA had outstanding membership interests subject to mandatory redemption (including current portion) of \$32 million issued by one of its VIEs of which it is the primary beneficiary. See Note 10 for additional information. At September 30, 2017, the mandatory redemptions for each of the next five years are shown below:

	2018	2019	2020	2021	2022
Membership interests of variable interest entity subject to mandatory redemption	\$ 2	\$ 2	\$ 3	\$ 3	\$ 3

**Leases.** TVA leases certain property, plant, and equipment under agreements with terms ranging from one to 38 years. TVA's rental expense for operating leases, including power purchase agreement operating leases, was \$90 million in 2017, \$86 million in 2016, and \$88 million in 2015. At September 30, 2017, the future minimum lease payments under operating leases, including purchased power agreements that are accounted for as operating leases, are shown below.

Operating	
Leases	
Minimum	
payments due in	
years ending	
September 30	
2018	\$67

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2019	60
2020	59
2021	59
2022	45
Thereafter	13
Total	\$303

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At September 30, 2017, the future minimum lease payments under capital leases are shown below.

## Capital Leases

Minimum payments due in years ending

September 30

2018	\$52
2019	51
2020	51
2021	51
2022	51
Thereafter	519
Minimum annual payments	775
Less: amount representing interest	(588 )
Total	\$187

Leasebacks. At September 30, 2017, and 2016, the outstanding leaseback obligations related to CTs and QTE were \$338 million and \$467 million, respectively. See Note 13 — Lease/Leasebacks. At September 30, 2017, the future minimum payments under leaseback obligations are shown below.

## Lease/Leasebacks

Minimum

payments due in

years ending

September 30

2018	\$ 50
2019	49
2020	50
2021	207
2022	25
Thereafter	—
Total	\$ 381

Unfunded Loan Commitments. At September 30, 2017, TVA's commitments under unfunded loan commitments for each of the next five years are shown below:

## Unfunded Loan Commitments

Payments due in the years ending September 30

	2018	2019	2020	2021	2022
Unfunded loan commitments	\$ 12	\$ —	\$ —	\$ —	—

In addition to the commitments above, TVA has contractual obligations in the form of revenue discounts related to energy prepayments. See Note 1 — Energy Prepayment Obligations.

## Energy Prepayment Obligations

Payments due in the years ending September 30

	2018	2019	2020	2021	2022	Thereafter	Total
Energy prepayment obligations	\$100	\$ 10	\$ —	\$ —	\$ —	—	—\$110
Interest payments relating to energy prepayment obligations	46	4	—	—	—	—	50
Total	\$146	\$ 14	\$ —	\$ —	\$ —	—	—\$160

## Contingencies

Nuclear Insurance. Section 170 of the Atomic Energy Act, commonly known as the Price-Anderson Act, provides a layered framework of protection to compensate for liability claims of members of the public for personal injury and property damages arising from a nuclear event in the United States. For the first layer, all of the NRC nuclear plant licensees, including TVA, purchase \$450 million of nuclear liability insurance from American Nuclear Insurers for each plant with an operating license. Funds for the second layer, the Secondary Financial Program, would come from an assessment of up to \$127 million from the licensees of each of the 102 NRC licensed reactors in the United States. The assessment for any nuclear accident would be limited to \$19 million per year per unit. American Nuclear Insurers, under a contract with the NRC, administers the Secondary Financial Program. With its seven licensed units, TVA could be required to pay a maximum of \$891 million per nuclear incident, but it would have to pay no more than \$133 million per incident in any one year. When the contributions of the

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nuclear plant licensees are added to the insurance proceeds of \$450 million, over \$13.0 billion, including a five percent surcharge for legal expenses, would be available. Under the Price-Anderson Act, if the first two layers are exhausted, the U.S. Congress is required to take action to provide additional funds to cover the additional losses.

Federal law requires that each NRC power reactor licensee obtain property insurance from private sources to cover the cost of stabilizing or shutting down a reactor after an accident. TVA carries property, decommissioning, and decontamination insurance from Nuclear Electric Insurance Limited ("NEIL"), totaling \$5.1 billion for its licensed nuclear plants with up to \$2.1 billion available for a loss at any one site. Some of this insurance may require the payment of retrospective premiums up to a maximum of approximately \$126 million.

TVA purchases accidental outage (business interruption) insurance for TVA's nuclear sites from NEIL. In the event that an accident covered by this policy takes a nuclear unit offline or keeps a nuclear unit offline, NEIL will pay TVA, after a waiting period, an indemnity (a set dollar amount per week) up to a maximum indemnity of \$490 million per unit. This insurance policy may require the payment of retrospective premiums up to a maximum of approximately \$43 million.

**Decommissioning Costs.** TVA recognizes legal obligations associated with the future retirement of certain tangible long-lived assets related primarily to nuclear generating plants, coal-fired generating plants, hydroelectric generating plants/dams, transmission structures, and other property-related assets. See Note 12.

**Nuclear Decommissioning.** Provision for decommissioning costs of nuclear generating units is based on options prescribed by the NRC procedures to dismantle and decontaminate the facilities to meet the NRC criteria for license termination. At September 30, 2017, the estimated future decommissioning cost of \$2.9 billion was included in AROs. The actual decommissioning costs may vary from the derived estimates because of, among other things, changes in current assumptions, such as the assumed dates of decommissioning, changes in regulatory requirements, changes in technology, and changes in the cost of labor, materials, and equipment. Utilities that own and operate nuclear plants are required to use different procedures in calculating nuclear decommissioning costs under GAAP than those that are used in calculating nuclear decommissioning costs when reporting to the NRC. The two sets of procedures produce different estimates for the costs of decommissioning primarily because of differences in the underlying assumptions.

TVA maintains a NDT to provide funding for the ultimate decommissioning of its nuclear power plants. See Note 16. TVA monitors the value of its NDT and believes that, over the long term and before cessation of nuclear plant operations and commencement of decommissioning activities, adequate funds from investments and additional contributions, if necessary, will be available to support decommissioning. TVA's operating nuclear power units are licensed through 2033 - 2055, depending on the unit. It may be possible to extend the operating life of some of the units with approval from the NRC. See Note 7 — Nuclear Decommissioning Costs and Note 12.

**Non-Nuclear Decommissioning.** The estimated future non-nuclear decommissioning ARO was \$1.4 billion at September 30, 2017. This decommissioning cost estimate involves estimating the amount and timing of future expenditures and making judgments concerning whether or not such costs are considered a legal obligation. Estimating the amount and timing of future expenditures includes, among other things, making projections of the timing and duration of the asset retirement process and how costs will escalate with inflation. The actual decommissioning costs may vary from the derived estimates because of changes in current assumptions, such as the assumed dates of decommissioning, changes in regulatory requirements, changes in technology, and changes in the cost of labor, materials, and equipment.

TVA maintains an ART to help fund the ultimate decommissioning of its non-nuclear power assets. See Note 16. Estimates involved in determining if additional funding will be made to the ART include inflation rate, rate of return

projections on the fund investments, and the planned use of other sources to fund decommissioning costs. See Note 7 — Non-Nuclear Decommissioning Costs and Note 12.

**Environmental Matters.** TVA's power generation activities, like those across the utility industry and in other industrial sectors, are subject to federal, state, and local environmental laws and regulations. Major areas of regulation affecting TVA's activities include air quality control, water quality control, and management and disposal of solid and hazardous wastes. In the future, regulations in all of these areas are expected to become more stringent. Regulations are also expected to apply to new emissions and sources, with a particular emphasis on climate change, renewable generation, and energy efficiency.

TVA has incurred, and expects to continue to incur, substantial capital and operating and maintenance costs to comply with evolving environmental requirements primarily associated with, but not limited to, the operation of TVA's coal-fired generating units. Environmental requirements placed on the operation of TVA's coal-fired and other generating units will likely continue to become more restrictive over time. Litigation over emissions or discharges from coal-fired generating units is also occurring, including litigation against TVA. Failure to comply with environmental and safety laws can result in TVA being subject to enforcement actions, which can lead to the imposition of significant civil liability, including fines and penalties, criminal sanctions, and/or the shutting down of non-compliant facilities.

From the 1970s to 2017, TVA spent approximately \$6.7 billion to reduce emissions from its power plants, including \$206 million, \$259 million, and \$315 million in 2017, 2016, and 2015, respectively, on clean air controls. TVA estimates that

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compliance with existing and future Clean Air Act ("CAA") requirements (excluding greenhouse gas ("GHG") requirements) could lead to costs of \$200 million from 2018 to 2022, which include future clean air controls, existing controls capital projects, and air operations and maintenance projects. The majority of the \$200 million is expected to be spent by 2018 on new controls at Gallatin and Shawnee Fossil Plants. TVA also estimates additional expenditures of approximately \$1.1 billion from 2018 to 2022 relating to TVA's CCR conversion program, not including costs related to any new requirements related to the Gallatin lawsuits, as well as expenditures of approximately \$500 million from 2018 to 2026 relating to compliance with Clean Water Act requirements. Future costs could differ from these estimates if new environmental laws or regulations become applicable to TVA or the facilities it operates, or if existing environmental laws or regulations are revised or reinterpreted. There could also be costs that cannot reasonably be predicted at this time, due to uncertainty of actions, that could increase these estimates.

Liability for releases and cleanup of hazardous substances is primarily regulated by the federal Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), and other federal and parallel state statutes. In a manner similar to many other industries and power systems, TVA has generated or used hazardous substances over the years.

TVA operations at some facilities have resulted in contamination that TVA is addressing. At September 30, 2017, and September 30, 2016, TVA's estimated liability for cleanup and similar environmental work for those sites for which sufficient information is available to develop a cost estimate was approximately \$7 million and \$23 million, respectively, on a non-discounted basis, and was included in Accounts payable and accrued liabilities and Other long-term liabilities on the Consolidated Balance Sheets.

## Legal Proceedings

From time to time, TVA is party to or otherwise involved in lawsuits, claims, proceedings, investigations, and other legal matters ("Legal Proceedings") that have arisen in the ordinary course of conducting TVA's activities, as a result of a catastrophic event or otherwise.

General. At September 30, 2017, TVA had accrued \$22 million with respect to Legal Proceedings. Of the accrued amount, \$13 million is included in Other long-term liabilities and \$9 million is included in Accounts payable and accrued liabilities. No assurance can be given that TVA will not be subject to significant additional claims and liabilities. If actual liabilities significantly exceed the estimates made, TVA's results of operations, liquidity, and financial condition could be materially adversely affected.

Environmental Agreements. In April 2011, TVA entered into two substantively similar agreements, one with the EPA and the other with Alabama, Kentucky, North Carolina, Tennessee, and three environmental advocacy groups: the Sierra Club, the National Parks Conservation Association, and Our Children's Earth Foundation (collectively, the "Environmental Agreements"). They became effective in June 2011. Under the Environmental Agreements, TVA committed to (1) retire on a phased schedule 18 coal-fired units with a combined summer net dependable capability of 2,200 MW, (2) control, convert, or retire additional coal-fired units with a combined summer net dependable capability of 3,500 MW, (3) comply with annual, declining emission caps for SO<sub>2</sub> and NO<sub>x</sub>, (4) invest \$290 million in certain TVA environmental projects (of which TVA had spent approximately \$275 million as of September 30, 2017), (5) provide \$60 million to Alabama, Kentucky, North Carolina, and Tennessee to fund environmental projects, and (6) pay civil penalties of \$10 million. In exchange for these commitments, most past claims against TVA based on alleged New Source Review and associated violations were waived and cannot be brought against TVA. Future claims, including those for sulfuric acid mist and GHG emissions, can still be brought against TVA, and claims for increases in particulates can also be pursued at many of TVA's coal-fired units. Additionally, the Environmental Agreements do not address compliance with new laws and regulations or the cost associated with such compliance.



The liabilities related to the Environmental Agreements are included in Accounts payable and accrued liabilities and Other long-term liabilities on the September 30, 2017 Consolidated Balance Sheet. In conjunction with the approval of the Environmental Agreements, the TVA Board determined that it was appropriate to record TVA's obligations under the Environmental Agreements as regulatory assets, and they are included as such on the September 30, 2017 Consolidated Balance Sheet and will be recovered in rates in future periods.

Case Involving Tennessee Valley Authority Retirement System. In March 2010, eight current and former participants in and beneficiaries of TVARS filed suit in the U.S. District Court for the Middle District of Tennessee challenging the TVARS Board's 2009 decision to amend the TVARS Rules and Regulations ("Rules") in exchange for a \$1.0 billion contribution from TVA. The changes approved by the TVARS Board (1) suspended the TVA contribution requirements for 2010 through 2013, (2) reduced the calculation for COLAs for CY 2010 through CY 2013, (3) reduced the interest crediting rate for the fixed fund accounts, and (4) increased the eligibility age to receive COLAs from age 55 to 60. The plaintiffs alleged that these changes violated their constitutional rights (due process, equal protection, and property rights), violated the Administrative Procedure Act, and violated the substantive and procedural components of an anti-cutback provision in the Rules. TVA and the plaintiffs filed cross motions for summary judgment. In August 2015, the court granted TVA's motion for summary judgment and dismissed the case with prejudice. In September 2015, the plaintiffs appealed this decision to the Sixth Circuit. On August 12, 2016, the Sixth Circuit held that the plaintiffs' rights were not violated because COLAs are not vested benefits. A few other issues were remanded to the district court for further proceedings. On March 2, 2017, the district court granted TVA's motion for a judgment

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on the administrative record and dismissed all the remaining claims in this case. On March 31, 2017, the plaintiffs appealed the district court's decision to the Sixth Circuit.

**Cases Involving Gallatin Fossil Plant CCR Facilities.** TVA is a party in two lawsuits relating to alleged releases of waste materials from the CCR facilities at Gallatin. See Note 8 — Background — Lawsuit Brought by TSRA and TCWN and Lawsuit Brought by TDEC.

**Administrative Proceeding Regarding Browns Ferry Nuclear Plant Extended Power Uprate.** In September 2016, the Bellefonte Efficiency and Sustainability Team and Mothers Against Tennessee River Radiation requested a hearing and sought to intervene in TVA's license amendment request for extended power uprates at Browns Ferry Nuclear Plant. The petitioners contend that TVA's application did not correctly report the potential risk from operating at increased power levels. TVA and the NRC staff filed answers opposing the petition to intervene in October 2016. The Atomic Safety and Licensing Board ("ASLB") rejected the petition to intervene in November 2016. In April 2017, the NRC affirmed the ASLB's decision to deny the petition, which terminated the administrative proceeding.

**Petitions to Intervene in the Proceeding Involving the Early Site Permit Application for Small Modular Reactors at TVA's Clinch River Site.** Three environmental groups the Southern Alliance for Clean Energy ("SACE"), Tennessee Environmental Council ("TEC"), and Blue Ridge Environmental Defense League ("BREDL") filed petitions to intervene in the proceeding regarding the Early Site Permit Application that TVA submitted for review by the NRC in May 2016 relating to the potential future construction and operation of two or more small modular reactor units at TVA's Clinch River site in Oak Ridge, Tennessee. On October 10, 2017, the Atomic Safety and Licensing Board issued a decision admitting two contentions proffered jointly by SACE and TEC and dismissing a third. The decision also denied admission of BREDL's one proffered contention.

**Bull Run Fossil Plant Clean Air Act Permit.** In September 2015, the Sierra Club and Environmental Integrity Project filed a petition with the EPA requesting that the EPA object to the CAA renewal permit issued by TDEC to TVA for operations at Bull Run. The petitioners alleged that the permit contained impermissibly lax monitoring requirements for opacity. In February 2016, the petitioners sued the EPA for not responding to the petition in a timely manner. In August 2016, the United States District Court for the District of Columbia entered a consent decree requiring the EPA to respond to the petition by November 10, 2016. On November 10, 2016, the EPA granted the petition and ordered TDEC to revise the permit to assure compliance with the opacity limits. TDEC revised the permit in accordance with the EPA's order and released it for public comment on February 7, 2017. No comments were received and TDEC issued a final permit, which became effective on April 10, 2017. The final permit provides that compliance with the particulate matter ("PM") limit is deemed sufficient to demonstrate compliance with the opacity limit. TVA plans to continue to meet the PM limit in the permit.

**Gallatin Fossil Plant Clean Air Act Permit.** In August 2016, the Sierra Club filed a petition with the EPA requesting that the EPA object to the CAA renewal permit issued by TDEC to TVA for operations at Gallatin. The petition alleges that the permit (1) contains compliance evaluation requirements for opacity, particulate matter, and fugitive dust that are not as stringent as required, (2) includes allowances for startup, shutdown, and malfunctions that are inconsistent with the CAA, (3) fails to include reporting requirements to ensure compliance with the Environmental Agreements, and (4) contains impermissibly high SO<sub>2</sub> emission limits. The EPA has not yet acted on the petition. On May 15, 2017, the Sierra Club filed a lawsuit in the United States District Court for the District of Columbia seeking to compel the EPA to act on the petition. TDEC issued a public notice on July 3, 2017, proposing to revise the CAA renewal permit. The period to submit comments on this draft permit closed on August 9, 2017. TDEC will review the comments and provide any revisions to the EPA, which has 45 days to review the revisions before the permit becomes final. Gallatin can still operate under the existing permit while the renewal permit is being revised.

## 22. Related Parties

TVA is a wholly-owned corporate agency of the federal government, and because of this relationship, TVA's revenues and expenses are included as part of the federal budget as a revolving fund. TVA's purpose and responsibilities as an agency are described under the "Other Agencies" section of the federal budget.

TVA currently receives no appropriations from Congress and funds its business using power system revenues, power financings, and other revenues. TVA is a source of cash to the federal government. TVA will indefinitely continue to pay a return on the outstanding \$258 million power program appropriation investment. See Note 17 — Appropriation Investment.

TVA also has access to a financing arrangement with the U.S. Treasury pursuant to the TVA Act. TVA and the U.S. Treasury entered into a memorandum of understanding under which the U.S. Treasury provides TVA with a \$150 million credit facility. This credit facility was renewed and has a maturity date of September 30, 2018. Access to this credit facility or other similar financing arrangements has been available to TVA since the 1960s. See Note 13 — Credit Facility Agreements.

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In the normal course of business, TVA contracts with other federal agencies for sales of electricity and other services. Transactions with agencies of the federal government were as follows:

## Related Party Transactions

For the years ended, or at, September 30

	2017	2016	2015
Revenue from sales of electricity	\$126	\$126	\$130
Other income	136	161	167
Expenditures			
Operating expenses	216	216	227
Additions to property, plant, and equipment	16	32	37
Cash and cash equivalents	46	54	45
Accounts receivable, net	119	129	106
Accounts payable and accrued liabilities	71	77	98
Long-term power bonds, net	1	4	5
Return on Power Program Appropriation Investment	5	6	5

## 23. Unaudited Quarterly Financial Information

A summary of the unaudited quarterly results of operations for the years 2017 and 2016 follows. This summary should be read in conjunction with the audited consolidated financial statements appearing herein. Results for interim periods may fluctuate as a result of seasonal weather conditions, changes in rates, and other factors.

## Unaudited Quarterly Financial Information

2017

	First	Second	Third	Fourth	Total
Operating revenues	\$2,546	\$2,547	\$2,571	\$3,075	\$10,739
Operating expenses	2,117	2,013	2,010	2,624	8,764
Operating income	429	534	561	451	1,975
Net income (loss)	102	211	233	139	685

## Unaudited Quarterly Financial Information

2016

	First	Second	Third	Fourth	Total
Operating revenues	\$2,280	\$2,571	\$2,479	\$3,286	\$10,616
Operating expenses	2,052	1,982	1,913	2,343	8,290
Operating income	228	589	566	943	2,326
Net income (loss)	(37)	318	291	661	1,233

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Report of Independent Registered Public Accounting Firm

We have audited the accompanying consolidated balance sheets of Tennessee Valley Authority as of September 30, 2017 and 2016, and the related consolidated statements of operations, comprehensive income (loss), changes in proprietary capital, and cash flows for each of the three years in the period ended September 30, 2017. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Tennessee Valley Authority at September 30, 2017 and 2016, and the consolidated results of its operations and its cash flows for each of the three years in the period ended September 30, 2017, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), Tennessee Valley Authority's internal control over financial reporting as of September 30, 2017, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated November 14, 2017 expressed an unqualified opinion thereon.

/s/ Ernst & Young LLP

Chattanooga, Tennessee  
November 14, 2017



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ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

Not applicable.

ITEM 9A. CONTROLS AND PROCEDURES

Disclosure Controls and Procedures

TVA's management, including the President and Chief Executive Officer, the Executive Vice President and Chief Financial Officer, and members of the Disclosure Control Committee, including the Vice President and Controller (Principal Accounting Officer), evaluated the effectiveness of TVA's disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934 (the "Exchange Act")) as of September 30, 2017. Based on this evaluation, TVA's management, including the President and Chief Executive Officer, the Executive Vice President and Chief Financial Officer, and members of the Disclosure Control Committee, including the Vice President and Controller (Principal Accounting Officer), concluded that TVA's disclosure controls and procedures were effective as of September 30, 2017, to ensure that information required to be disclosed by TVA in reports that it files or submits under the Exchange Act, is recorded, processed, summarized, and reported, within the time periods specified in the Securities and Exchange Commission's rules and forms, and include controls and procedures designed to ensure that information required to be disclosed by TVA in such reports is accumulated and communicated to TVA's management, including the President and Chief Executive Officer, the Executive Vice President and Chief Financial Officer, and members of the Disclosure Control Committee, including the Vice President and Controller (Principal Accounting Officer), as appropriate, to allow timely decisions regarding required disclosure.

Internal Control over Financial Reporting

(a) Management's Annual Report on Internal Control over Financial Reporting

TVA's management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Exchange Act Rule 13a-15(f) and required by Section 404 of the Sarbanes-Oxley Act. TVA's internal control over financial reporting is designed to provide reasonable, but not absolute, assurance regarding the reliability of financial reporting and the preparation of financial statements in accordance with generally accepted accounting principles. Because of the inherent limitations in all control systems, internal controls over financial reporting and systems may not prevent or detect misstatements.

TVA's management, including the President and Chief Executive Officer, the Executive Vice President and Chief Financial Officer, and members of the Disclosure Control Committee, including the Vice President and Controller (Principal Accounting Officer), evaluated the design and effectiveness of TVA's internal control over financial reporting as of September 30, 2017, based on the framework in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation, TVA's management concluded that TVA's internal control over financial reporting was effective as of September 30, 2017.

Although the effectiveness of internal control over financial reporting was not required to be subject to attestation by TVA's independent registered public accounting firm, TVA has chosen to obtain such a report. Ernst & Young LLP, the independent registered public accounting firm that audited the financial statements included in this Annual Report, has issued an attestation report on TVA's internal control over financial reporting.

(b) Changes in Internal Control over Financial Reporting

During the quarter ended September 30, 2017, there were no changes in TVA's internal control over financial reporting that materially affected, or are reasonably likely to materially affect, TVA's internal control over financial reporting.

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Report of Independent Registered Public Accounting Firm

The Board of Directors of Tennessee Valley Authority

We have audited Tennessee Valley Authority's internal control over financial reporting as of September 30, 2017, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). Tennessee Valley Authority's management is responsible for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the company's internal control over financial reporting based on our audit.

We conducted our audit in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

In our opinion, Tennessee Valley Authority maintained, in all material respects, effective internal control over financial reporting as of September 30, 2017, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheets of Tennessee Valley Authority as of September 30, 2017 and 2016, and the related consolidated statements of operations, comprehensive income (loss), changes in proprietary capital, and cash flows for each of the three years in the period ended September 30, 2017, and our report dated November 14, 2017 expressed an unqualified opinion thereon.

/s/ Ernst & Young LLP

Chattanooga, Tennessee  
November 14, 2017

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ITEM 9B. OTHER INFORMATION

On November 9, 2017, the TVA Board of Directors approved adjustments to the compensation of Chief Executive Officer William D. Johnson for 2018. Mr. Johnson's base salary will increase from \$995,000 to \$1,050,000. Mr. Johnson was awarded a performance grant ("LTP") of \$2,315,250 under TVA's Long-Term Incentive Plan ("LTIP") effective October 1, 2017, which will vest on September 30, 2020. Mr. Johnson was also awarded a retention grant ("LTR") of \$992,250 under TVA's LTIP effective October 1, 2017, which will vest in three equal increments on September 30, 2018, September 30, 2019, and September 30, 2020, subject to his being employed through such dates.

On November 9, 2017, Mr. Johnson approved compensation adjustments for the following Named Executive Officers for 2018:

The salary for Mr. Thomas will increase from \$610,018 to \$628,319. Additionally, Mr. Thomas was awarded a LTP grant of \$850,000 effective October 1, 2017, which will vest on September 30, 2020. Mr. Thomas also received a LTR grant of \$350,000 effective October 1, 2017, which will vest in three equal increments on September 30, 2018, September 30, 2019, and September 30, 2020, subject to his being employed through such dates.

The salary for Mr. Grimes will increase from \$650,000 to \$669,500. Additionally, Mr. Grimes was awarded a LTP grant of \$825,000 effective October 1, 2017, which will vest on September 30, 2020. Mr. Grimes also received a LTR grant of \$325,000 effective October 1, 2017, which will vest in three equal increments on September 30, 2018, September 30, 2019, and September 30, 2020, subject to his being employed through such dates.

The salary for Mr. Skaggs will increase from \$495,285 to \$520,000. Additionally, Mr. Skaggs was awarded a LTP grant of \$750,000 effective October 1, 2017, which will vest on September 30, 2020. Mr. Skaggs also received a LTR grant of \$300,000 effective October 1, 2017, which will vest in three equal increments on September 30, 2018, September 30, 2019, and September 30, 2020, subject to his being employed through such dates.

The salary for Ms. Quirk will increase from \$477,405 to \$510,000. Additionally, Ms. Quirk was awarded a LTP grant of \$675,000 effective October 1, 2017, which will vest on September 30, 2020. Ms. Quirk also received a LTR grant of \$285,000 effective October 1, 2017, which will vest in three equal increments on September 30, 2018, September 30, 2019, and September 30, 2020, subject to her being employed through such dates.

The salary adjustments described above became effective as of October 1, 2017. No adjustments were made to any other existing elements of compensation for these Named Executive Officers for 2018.

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## PART III

## ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

## Directors

The Tennessee Valley Authority Act of 1933, as amended, 16 U.S.C. §§ 831-831ee (the “TVA Act”) provides that TVA shall be administered by a board of nine part-time members appointed by the President of the United States with the advice and consent of the United States Senate. The Chair of the TVA Board is selected by the members of the TVA Board. Under the TVA Act, to be eligible to be appointed as a member of the TVA Board, an individual (i) must be a United States citizen; (ii) must have management expertise relative to a large for-profit or nonprofit corporate, government, or academic structure; (iii) cannot be a TVA employee; (iv) must make a full disclosure to Congress of any investment or other financial interest that the individual holds in the energy industry; and (v) must affirm support for the objectives and missions of TVA, including being a national leader in technological innovation, low-cost power, and environmental stewardship. In addition, the President of the United States, in appointing members of the TVA Board, must (i) consider recommendations from other public officials such as the Governors of the states in TVA’s service area; individual citizens; business, industrial, labor, electric power distribution, environmental, civic, and service organizations; and the congressional delegations of the states in TVA’s service area; and (ii) seek qualified members from among persons who reflect the diversity, including geographical diversity, and needs of TVA’s service area. At least seven of the nine TVA Board members must be legal residents of the TVA service area. Currently, TVA has six active TVA Board members. Additional nominations have been made, but none have been confirmed.

TVA Board members serve five-year terms, and at least one member’s term ends each year. After a member’s term ends, the member is permitted under the TVA Act to remain in office until the earlier of the end of the then-current session of Congress or the date a successor takes office. The TVA Board, among other things, establishes broad goals, objectives, and policies for TVA; develops long-range plans to guide TVA in achieving these goals, objectives, and policies; approves annual budgets; and establishes a compensation plan for employees.

The TVA Board as of November 14, 2017, consisted of the following six individuals with their ages and terms of office provided:

Directors	Age	Year Current Term Began	Year Term Expires
Richard C. Howorth, Chair	66	2015	2020
Marilyn A. Brown	68	2013	2017 <sup>(1)</sup>
V. Lynn Evans	64	2013	2017 <sup>(1)</sup>
Virginia T. Lodge	67	2014	2019
Ronald A. Walter	68	2014	2019
Eric M. Satz	48	2015	2018

## Note

(1) Although the terms of Director Brown and Director Evans expired in May 2017, each director is permitted under the TVA Act to remain in office until the earlier of the end of the current session of Congress or the date a successor takes office.

Mr. Howorth of Oxford, Mississippi, joined the TVA Board in July 2011 and began a second term on the TVA Board in December 2015. He is the owner of Square Books, an Oxford independent bookstore he founded in 1979. Mr. Howorth served two terms as the mayor of Oxford, from 2001 to 2009, during which time he was chair of the authority overseeing the Oxford Electric Department. From 2001 to 2009, he also served as a director and officer of the North Mississippi Industrial Development Association, an economic development consortium made up of power association directors and mayors of cities in 29 Mississippi counties in the TVA service area.

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Dr. Brown of Atlanta, Georgia, served on the TVA Board from October 2010 to January 2013 and began a second term on the TVA Board in September 2013. Dr. Brown has been a Professor in the School of Public Policy at Georgia Institute of Technology in Atlanta, Georgia, since August 2006. From 1984 to August 2006, Dr. Brown worked at the Oak Ridge National Laboratory ("ORNL") in Oak Ridge, Tennessee. At ORNL, she was Deputy Director and Acting Director of the Engineering Science and Technology Division from 2005 to 2006 and Program Director of the Energy Efficiency and Renewable Energy Program from 2000 to 2005. Dr. Brown served from 2006 until 2009 as a member of the Board of Directors of the Southeast Energy Efficiency Alliance, serving as Board Chair from 2006 until 2008. She served as a member of the Board of Directors of the American Council for an Energy-Efficient Economy from 2002 until 2009. From 2002 until 2009, Dr. Brown was a commissioner on the National Commission on Energy Policy. She served as a member of the Board of Directors of the Alliance to Save Energy from 2000 through 2009.

Ms. Evans of Memphis, Tennessee, joined the TVA Board in January 2013. She has been the owner of V. Lynn Evans, CPA, a certified public accounting and consulting firm in Memphis, Tennessee, since 1983. Ms. Evans was a board member of Memphis Light, Gas and Water Division, a TVA local power company customer, from 2004 to January 2013, and served as Chair from January 2008 to December 2009. She has been a director of community-based First Alliance Bank in Memphis,

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Tennessee, since its inception in 1998, holding various positions, including chair of the audit committee and loan committee member. Ms. Evans has also served in leadership positions in a number of community organizations, including as a board member of ArtsMemphis from 1995 to 2008, Community Foundation of Greater Memphis from 1995 to 2004 and from 2006 to present, the RISE Foundation from 1997 to 2007, and the Women's Foundation for a Greater Memphis from 1999 to 2001. Ms. Evans is a member of the American Institute of Certified Public Accountants and the Tennessee Society of Certified Public Accountants (Memphis Chapter).

Ms. Lodge of Nashville, Tennessee, joined the TVA Board in December 2014. She has served as the Chief Executive Officer ("CEO") of FSI Inc., a fulfillment and supply chain company based in Nashville, Tennessee, since March 2012. She served as Commissioner of the Tennessee Department of Human Services from 2003 to 2011. From 2002 to 2003, she worked on Tennessee Governor Phil Bredesen's campaign and transition team. Ms. Lodge was National Director of GoreCorps for the Gore for President Campaign in 2000 and served as Executive Director for Kids Voting of Middle Tennessee from 1994 to 1999.

Mr. Walter of Memphis, Tennessee, joined the TVA Board in December 2014. He is currently the President and General Manager of WREG-TV, a Memphis-based television station. Mr. Walter has been employed by WREG-TV since 1987, and assumed his current position in 2004. Mr. Walter was Vice President of Customer Relations for the Memphis Light, Gas and Water Division from 1982 to 1987. From 1980 to 1982, he served as Assistant to the President at Memphis Light, Gas and Water Division.

Mr. Satz of Nashville, Tennessee, joined the TVA Board in August 2015. He is a Managing Member of the Tennessee Community Ventures Fund, LLC ("TNCV"), a company he co-founded in 2009, and is Executive Chairman of one of the TNCV portfolio companies. From 2010 to 2014, he served as Investor, Advisor, and Vice President of Business Development for Panopto, Inc., a software company based in Seattle, Washington. Mr. Satz co-founded and was CEO of Plumgood Food, LLC from 2004 to 2008. Earlier in his career, Mr. Satz served in various investment banking roles, including as Vice President in the Technology Investment Banking Groups at Credit Suisse First Boston and Donaldson, Lufkin & Jenrette. In 1999, Mr. Satz co-founded Currenex, an online global foreign currency exchange company.

Executive Officers

TVA's executive officers as of November 14, 2017, their titles, their ages, and the date their employment with TVA commenced are as follows:

Executive Officers	Title	Age	Employment Commenced
William D. Johnson	President and Chief Executive Officer	63	2013
Joseph P. Grimes, Jr.	Executive Vice President, Generation	61	2013
Sherry A. Quirk	Executive Vice President and General Counsel	63	2015
Michael D. Skaggs	Executive Vice President, Operations	57	1994
John M. Thomas, III	Executive Vice President and Chief Financial Officer	53	2005
Van M. Wardlaw	Executive Vice President and Chief External Relations Officer	57	1982
Michael A. Balduzzi	Senior Vice President and Chief Nuclear Officer	59	2014
Janet J. Brewer	Senior Vice President and Chief Communications and Marketing Officer	58	2012
Susan E. Collins	Senior Vice President and Chief Human Resource Officer	51	2014
Diane T. Wear	Vice President and Controller (Principal Accounting Officer)	49	2008

Mr. Johnson has served as TVA's President and CEO since January 2013. Mr. Johnson served as Chair of the Board, President and CEO of Progress Energy, Inc. ("Progress Energy"), an electric utility based in Raleigh, North Carolina, from October 2007 to July 2012. During this time, Mr. Johnson also served as the Chair of Progress Energy Carolinas, Inc., and Progress Energy Florida, Inc., both of which are subsidiaries of Progress Energy. Mr. Johnson held a number of other positions before he became Chair and CEO of Progress Energy, including President and Chief Operating Officer of Progress Energy; Group President for Energy Delivery; President and CEO for Progress Energy Service Company, LLC; and General Counsel and Corporate Secretary for Progress Energy. Mr. Johnson joined Carolina Power & Light Company ("CP&L"), a predecessor to Progress Energy, in 1992. Before joining CP&L, Mr. Johnson was a partner with the Raleigh, North Carolina, law office of Hunton & Williams LLP, where he specialized in the representation of utilities.

Mr. Grimes joined TVA in July 2013 as Executive Vice President and Chief Nuclear Officer. He was named Executive Vice President, Generation, and Chief Nuclear Officer effective October 2016, and Executive Vice President, Generation effective January 2017. Before joining TVA, Mr. Grimes worked at Exelon Nuclear and held a variety of positions there, including Senior Vice President, Engineering and Technical Services, Exelon Nuclear Fleet from 2011 to 2013, Senior Vice President, Mid-Atlantic Operations from 2009 to 2011, and Site Vice President at Peach Bottom Nuclear Station from 2007 to 2008. Mr. Grimes joined Exelon Nuclear in 1979.

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Ms. Quirk has served as TVA's Executive Vice President and General Counsel since February 2015. From October 2010 to February 2015, Ms. Quirk was an equity partner in the law firm of Schiff Hardin LLP, which specializes in federal energy regulation, legislation, and power supply transactions. Prior to joining Schiff Hardin, Ms. Quirk was a partner in the Energy Group of Sullivan & Worcester LLP, and a partner in the Energy Group of Verner, Liipfert, Bernhard, McPherson and Hand, specializing in federal energy regulation, legislation, power supply transactions, and state proceedings.

Mr. Skaggs was named Executive Vice President, Operations effective October 2016. Since joining TVA in 1994 as Manager of Projects at Watts Bar Nuclear Plant, Mr. Skaggs has held several management positions, including Senior Vice President, Watts Bar Operations and Construction from September 2013 to October 2016, Senior Vice President, Nuclear Construction from February 2012 to September 2013, Senior Vice President of Nuclear Generation Development and Construction from October 2011 to February 2012, Site Vice President of Sequoyah Nuclear Plant from November 2010 to October 2011, Vice President of Nuclear Operations Support from December 2009 to November 2010, Site Vice President at Watts Bar Nuclear Plant from July 2005 to December 2009, and Site Vice President at Browns Ferry Nuclear Plant from July 2004 to July 2005.

Mr. Thomas has served as TVA's Chief Financial Officer since June 2010 and was also named Executive Vice President in February 2012. He served as Executive Vice President of People and Performance from January 2010 to June 2010, as Senior Vice President, Corporate Governance and Compliance from July 2009 to January 2010, as Controller and Chief Accounting Officer from January 2008 to September 2009, and as the General Manager, Operations Business Services from November 2005 to January 2008. Prior to joining TVA, Mr. Thomas was Chief Financial Officer during 2005 for Benson Security Systems. He was also the Controller of Progress Fuels Corporation from 2003 to 2005 and Controller of Progress Ventures, Inc. from 2001 to 2002, both subsidiaries of Progress Energy.

Mr. Wardlaw was named Executive Vice President and Chief External Relations Officer in July 2014. Mr. Wardlaw served as Senior Vice President, Customer Relations, from September 2013 to July 2014, as Executive Vice President, Customer Relations, from June 2011 to September 2013, as Executive Vice President, Enterprise Relations, from October 2010 to June 2011, as Acting Executive Vice President of Strategy and Planning from January 2010 until September 2010, as Executive Vice President of Power Supply and Fuels from July 2008 to August 2010, as Senior Vice President, Commercial Operations and Fuels from January 2007 to June 2008, as Vice President, Bulk Power Trading from September 2006 to December 2006, and as Vice President of Transmission and Reliability from December 2000 to September 2006. Mr. Wardlaw began his career with TVA in January 1982 as an electrical engineer, and has also worked in customer service, marketing, and field services.

Mr. Balduzzi was named Senior Vice President and Chief Nuclear Officer in January 2017. Mr. Balduzzi was formerly TVA's Senior Vice President of Nuclear Operations, a position he had held since joining TVA in January 2014. Prior to coming to TVA, Mr. Balduzzi served as Senior Vice President of Engineering and Technical Services for Entergy Nuclear from August 2011 to January 2014. Mr. Balduzzi has more than 34 years of experience in the nuclear industry, having held numerous leadership roles in operations, maintenance, and oversight activities at a number of nuclear facilities, including Vermont Yankee, Nine Mile Point, and Pilgrim nuclear stations.

Ms. Brewer joined TVA in 2012 as Vice President of Communications, and she was named Senior Vice President and Chief Communications and Marketing Officer in May 2016. Before joining TVA, Ms. Brewer worked at NCR Corporation, a global technology company based in Duluth, Georgia, and held a number of positions there, including Vice President of Corporate Communications from 2010 to 2012 and from 2006 to 2008, Vice President of Change Management and Communications for Continuous Improvement from 2008 to 2010, and Director of Community Relations from 2005 to 2006.



Ms. Collins joined TVA in May 2014 as Vice President of Human Resources, and she was named Senior Vice President and Chief Human Resources Officer in February 2016. Before joining TVA, Ms. Collins served as Senior Vice President of Human Resources for Constellation Energy Nuclear Group, LLC from 2009 to 2014 and as Vice President of Human Resources for Constellation Energy from 2008 to 2009.

Ms. Wear has served as TVA's Vice President and Controller since March 2012. Ms. Wear was the Assistant Controller from February 2010 to March 2012. Between April 2008, when she joined TVA, and February 2010, Ms. Wear was the General Manager, External Reporting/Accounting Policy and Research. Prior to joining TVA, Ms. Wear was a Managing Director at PricewaterhouseCoopers LLP. Ms. Wear joined a predecessor firm to PricewaterhouseCoopers LLP in January 1992.

#### Disclosure and Financial Code of Ethics

TVA has a Disclosure and Financial Ethics Code ("Financial Ethics Code") that applies to all executive officers (including the CEO, Chief Financial Officer, and Controller) and directors of TVA as well as to all employees who certify information contained in quarterly reports or annual reports or who have responsibility for internal control self-assessments. The Financial Ethics Code includes provisions covering conflicts of interest, ethical conduct, compliance with applicable laws, rules, and regulations, responsibility for full, fair, accurate, timely, and understandable disclosures, and accountability for adherence to the Financial Ethics Code. TVA will provide a current copy of the Financial Ethics Code to any person, without charge, upon request. Requests may be made by calling 888-882-4975 or by sending an e-mail to: [investor@tva.com](mailto:investor@tva.com). Any waivers of or

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changes to provisions of the Financial Ethics Code that require disclosure pursuant to applicable Securities and Exchange Commission requirements will be promptly disclosed to the public, subject to limitations imposed by law, on TVA's website at: [www.tva.gov](http://www.tva.gov). Information contained on TVA's website shall not be deemed incorporated into, or to be a part of, this Annual Report.

Committees of the TVA Board

The TVA Board has an Audit, Risk, and Regulation Committee established in accordance with the TVA Act. TVA's Audit, Risk, and Regulation Committee consists of V. Lynn Evans, Richard Howorth, and Virginia Lodge. Director Evans and Director Lodge are each an "audit committee financial expert" as defined in Item 407(d)(5) of Regulation S-K under the Exchange Act.

TVA is exempted by Section 37 of the Exchange Act from complying with Section 10A(m)(3) of the Exchange Act, which requires each member of a listed issuer's audit committee to be an independent member of the board of directors of the issuer. The TVA Act contains certain provisions that are similar to the considerations for independence under Section 10A(m)(3) of the Exchange Act, including that to be eligible for appointment to the TVA Board, an individual shall not be an employee of TVA and shall make full disclosure to Congress of any investment or other financial interest that the individual holds in the energy industry.

Under Section 10A(m)(2) of the Exchange Act, which applies to TVA, the audit committee is directly responsible for the appointment, compensation, and oversight of the external auditor; however, the TVA Act assigns the responsibility for engaging the services of the external auditor to the TVA Board.

The TVA Board has also established the following committees in addition to the Audit, Risk, and Regulation Committee:

- Finance, Rates, and Portfolio Committee
- External Relations Committee
- People and Performance Committee
- Nuclear Oversight Committee.

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ITEM 11. EXECUTIVE COMPENSATION

Compensation Discussion and Analysis

The purpose of the Compensation Discussion and Analysis is to describe TVA's compensation philosophy and the policies and decisions that guided compensation for TVA's Named Executive Officers in 2017. The 2017 Named Executive Officers ("NEOs") are as follows:

- ¶ William D. Johnson, President and Chief Executive Officer ("CEO");
- ¶ John M. Thomas, III, Executive Vice President and Chief Financial Officer ("CFO");
- ¶ Joseph P. Grimes, Jr., Executive Vice President, Generation;
- ¶ Michael D. Skaggs, Executive Vice President, Operations; and
- ¶ Sherry A. Quirk, Executive Vice President and General Counsel.

Executive Summary

The Tennessee Valley Authority ("TVA") is a corporate agency and instrumentality of the United States ("U.S.") that was created in 1933 by legislation enacted by the U.S. Congress in response to a request by President Franklin D. Roosevelt. TVA was created to, among other things, improve navigation on the Tennessee River, reduce the damage from destructive flood waters within the Tennessee River system and downstream on the lower Ohio and Mississippi Rivers, further the economic development of TVA's service area in the southeastern United States, and sell the electricity generated at the facilities TVA operates. Today, TVA operates the nation's largest public power system and supplies power to a population of over nine million people.

2017 Compensation Highlights

2017 At-Risk Compensation. Based on its annual performance and productivity, TVA rewards employees through its Winning Performance Team Incentive Plan ("WPTIP") and Executive Annual Incentive Plan ("EAIP"). In addition, certain executives in critical positions, including the NEOs, participate in long-term compensation plans (the Executive Long-Term Incentive Plan ("ELTIP") and the Long-Term Incentive Plan ("LTIP"), which replaced the ELTIP effective October 1, 2015). The LTIP provides for long-term performance ("LTP") grants and long-term retention ("LTR") grants. Similar to incentive programs at other utilities, awards under the WPTIP, EAIP, ELTIP, and the performance-based component of the LTIP are not part of base pay but are "at risk" and require employees to reach or exceed specific performance targets in order for payments to be earned.

For 2017, TVA transitioned from multiple organizational scorecards to a single scorecard, and the scorecard results for the EAIP were 103 percent of the target opportunity. The following factors contributed to overall performance:

- ¶ Lowest recordable injury rate since tracking began in 1985;
- ¶ Maintained strong financial health measures while contributing an extra \$500 million to the pension plan;
- ¶ Improved overall operational performance of TVA's nuclear fleet; and
- ¶ Helped to retain and attract over 70,000 jobs and over \$8.3 billion in capital investment to the TVA service area.

In addition, for the three-year period ended September 30, 2017, awards to NEOs under the ELTIP were 103 percent of the target opportunity primarily because of overall good performance and financial discipline. Throughout the 2015 - 2017 performance period, TVA accomplished the following objectives:

- ¶ Reduced fuel cost \$600 million over period with a balanced portfolio;
- ¶ Maintained excellent reliability; and

Maintained favorable stakeholder perception and improved customer satisfaction and loyalty.

2017 Compensation Adjustments. On November 10, 2016, the TVA Board approved the compensation of CEO William Johnson for 2017. Mr. Johnson was awarded a LTP grant of \$2,427,800 under the LTIP effective October 1, 2016, which will vest on September 30, 2019, provided certain performance targets are achieved and he is still employed on this date. Mr. Johnson also received a LTR grant under the LTIP of \$606,950 effective October 1, 2016, which will vest in three equal increments on September 30, 2017, 2018, and 2019, subject to his being employed through such dates. On December 12, 2016, the TVA Board approved a cash award opportunity for Mr. Johnson of up to \$200,000 per year, commencing in fiscal year 2017, based on the evaluation of his performance.

On November 10, 2016, Mr. Johnson approved compensation adjustments and grants for the following NEOs for 2017:

The salary for Mr. Thomas increased from \$592,250 to \$610,018. Additionally, Mr. Thomas was awarded a LTP grant of \$750,000 effective October 1, 2016, which will vest on September 30, 2019, provided certain performance targets are achieved and he is still employed on this date. Mr. Thomas also received a LTR grant of \$250,000 effective October 1, 2016, which will vest in three equal increments on September 30, 2017, 2018, and 2019, subject to his being employed through such dates.

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The salary for Mr. Grimes increased from \$600,000 to \$650,000. Additionally, Mr. Grimes was awarded a LTP grant of \$750,000 effective October 1, 2016, which will vest on September 30, 2019, provided certain performance targets are achieved and he is still employed on this date. Mr. Grimes also received a LTR grant of \$260,000 effective October 1, 2016, which will vest in three equal increments on September 30, 2017, 2018, and 2019, subject to his being employed through such dates.

- The salary for Mr. Skaggs increased from \$471,700 to \$495,285, and his EAIP opportunity increased from 70 percent of his salary to 80 percent of his salary. Additionally, Mr. Skaggs was awarded a LTP grant of \$750,000 effective October 1, 2016, which will vest on September 30, 2019, provided certain performance targets are achieved and he is still employed on this date. Mr. Skaggs also received a LTR grant of \$250,000 effective October 1, 2016, which will vest in three equal increments on September 30, 2017, 2018, and 2019, subject to his being employed through such dates.

The salary for Ms. Quirk increased from \$463,500 to \$477,405, and her EAIP opportunity increased from 65 percent of her salary to 70 percent of her salary. Additionally, Ms. Quirk was awarded a LTP grant of \$675,000 effective October 1, 2016, which will vest on September 30, 2019, provided certain performance targets are achieved and she is still employed on this date. Ms. Quirk also received a LTR grant of \$225,000 effective October 1, 2016, which will vest in three equal increments on September 30, 2017, 2018, and 2019, subject to her being employed through such dates.

**Anticipated Termination of Certain Compensation Plans.** On October 1, 2015, TVA adopted the LTIP, which, among other things, provides retention incentives that are similar in nature to the incentives provided under the LTDCP and LTRIP and performance incentives that are similar in nature to the incentives provided under the ELTIP. All previous credits issued under the LTDCP have vested, all awards granted under the LTRIP will vest by December 31, 2017, and the last performance cycle for the ELTIP ended on September 30, 2017; accordingly, TVA plans to terminate the LTDCP, LTRIP, and ELTIP in CY 2018.

## Philosophy

TVA is committed to achieving its mission to serve the people of the Tennessee Valley to make life better. It does this through a focus on three core areas: Energy, Environment and Economic Development. The compensation structure of TVA is developed to reinforce TVA's mission and strategic imperatives.

TVA aims to achieve its mission by attracting, retaining, and motivating highly qualified and committed executives to guide the organization's strategy and performance. TVA follows a compensation plan ("Compensation Plan") as adopted by the TVA Board in accordance with the guidance of the TVA Act. The Compensation Plan is designed to:

- Provide market-based, competitive compensation levels so TVA can attract, retain, and motivate highly competent employees. Total direct compensation generally targets the 50th percentile of the relevant labor market, although some positions are targeted up to the 75th percentile based on labor market scarcity and other issues.

- Reward employees for performance. A substantial portion of executive pay, including pay for the Named Executive Officers, is tied to performance improvement. As illustrated in the charts below, at least half of each NEO's target total direct compensation opportunity is delivered through performance-based incentive programs.

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Align the organization's short-term and long-term goals and objectives with compensation opportunity by providing a mix of salary and performance-based short-term and long-term incentives.

Align performance and productivity improvement at all levels by setting consistent performance goals and objectives for all levels of the organization.

The TVA Board follows these requirements of the TVA Act in designing and implementing its Compensation Plan:

Compensation will be based on an annual survey of prevailing compensation for similar positions in private industry, including engineering and electric utility companies, publicly-owned electric utilities, and federal, state, and local governments; and

Compensation will take into account education, experience, level of responsibility, geographic differences, and retention and recruitment needs.

Authority for the Executive Compensation Program

The TVA Board, under the authority of the TVA Act, has responsibility for establishing compensation for TVA employees, including the NEOs. The TVA Board is directed under Section 2 of the TVA Act to establish a plan that specifies all compensation (such as salary and any other pay, benefits, incentives, or other form of remuneration) for the CEO and TVA employees.

The TVA Act also provides that:

The TVA Board will annually approve all compensation (such as salary and any other pay, benefits, incentives, or other form of remuneration) for all managers and technical personnel who report directly to the CEO (including any adjustment(s) to compensation);

On the recommendation of the CEO, the TVA Board will approve the salaries of employees whose salaries would be in excess of Level IV of the Executive Schedule of the United States Government (\$161,900 in 2017); and

The CEO will determine the salary and benefits of employees whose annual salary is not greater than Level IV of the Executive Schedule (\$161,900 in 2017).

Under the authority of the TVA Act, the TVA Board, its People and Performance Committee (the "Committee"), and individual TVA Board members are involved in compensation matters. The TVA Board has delegated to the CEO the authority to approve, or delegate to others the authority to approve, all personnel and compensation actions for which the TVA Board is responsible but has not reserved for itself. In addition, the TVA Board has taken the following actions to delegate authority with respect to executive compensation:

The TVA Board has authorized the CEO to set or adjust compensation for present or future direct reports within compensation ranges of 80 percent to 110 percent of the targeted total direct compensation for comparable positions, as well as to approve the parameters under which such executives may participate in certain supplemental benefit plans such as TVA's Supplemental Executive Retirement Plan ("SERP"), provided that the CEO may not finally set or adjust such compensation until the TVA Board members have been notified of the proposed compensation and given the opportunity to ask the Committee, or the full TVA Board, to review the proposed compensation before it becomes effective.



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The TVA Board has delegated to the Board Chair, in consultation with the Committee and with input from individual members of the TVA Board, the authority to evaluate and rate the CEO's performance during the year, and the authority to approve any payout to the CEO under the EAIP, based on, among other things, the CEO's evaluated performance during the year.

The TVA Board has delegated to the CEO, in consultation with the Committee and with input from individual members of the TVA Board, the authority to approve the individual performance goals for the CEO's direct reports and the authority to evaluate and rate the performance of the CEO's direct reports during the year.

### TVA Board Committee Oversight

The Committee was responsible for oversight of executive compensation pursuant to the Compensation Plan, review of this Compensation Discussion and Analysis, and review of performance goal achievement for 2017. As delegated by the TVA Board, the Committee also (1) reviewed proposed CEO actions to set or adjust compensation for his direct reports, (2) consulted with the Board Chair about the Chair's proposed evaluation and rating of the CEO's performance during the year and about the proposed payout to the CEO under the EAIP, and (3) consulted with the CEO on the proposed individual performance goals and evaluation and performance ratings for the CEO's direct reports for the year. The Committee used the independent consulting firm Frederic W. Cook & Co., Inc. ("FW Cook") in 2017 to help evaluate competitive compensation. The Committee assessed certain independence factors and determined the firm's work raised no potential conflict of interest.

### Assessment of Risk

TVA's Enterprise Risk Management Organization, in coordination with other members of TVA's management, including Human Resources and Compensation and Benefits, conducts an annual assessment of enterprise level risks that considers risks arising from TVA's compensation policies and practices, in order to identify any risks that are reasonably likely to have a material adverse effect on the organization and its achievement of its strategic goals and objectives.

Based on the results of this assessment, no risks were identified with the compensation policies and practices that are reasonably likely to have a material adverse effect on TVA's achievement of its strategic goals and objectives.

### Use of Market Data and Benchmarking

TVA generally targets total direct compensation for executives at a competitive level based on the relevant labor market. After compiling market compensation for the positions at the beginning of 2017, the Committee, with assistance from FW Cook, used the information to:

- Test target compensation level and incentive opportunity competitiveness; and

• Determine appropriate target compensation levels and incentive opportunities to maintain the desired degree of market competitiveness.

The relevant labor market for most of TVA's executives, including the NEOs, consisted of both private and publicly-owned companies in the energy services industry of similar revenue and scope to TVA. TVA's peer group is reviewed on an annual basis. For the survey-based analysis, TVA used the 2016 Willis Towers Watson Energy Services Executive Compensation Database and targeted 28 investor owned utilities with revenues greater than or equal to \$3 billion. This positions TVA near the middle of the revenue based peer group of multiple large utilities. Six



additional government entities participated in the 2016 Willis Towers Watson Energy Services Executive Compensation Survey and were considered by the Committee on the basis of industry similarity, although their annual revenue was \$3 billion or less.

Survey data is supplemented with proxy data to provide additional market reference points for NEO functional roles. When conducting proxy analysis, competitive comparisons are made relative to a "market composite" or an average of the survey and proxy data as recommended by FW Cook. Several companies were considered in the proxy analysis because they are energy services firms with annual revenue between approximately one-half and two times TVA's revenue.

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The following chart outlines the companies that constitute the 2016 Willis Towers Watson Energy Services survey sample and the proxy peer group, which together formed the competitive market reference for benchmarking NEO compensation for 2017:

Company	Investor Owned Utilities with Revenue Greater than or Equal to \$3 Billion Which Participated in 2016 Willis Towers Watson Energy Services Survey	Government Entities Which Participated in 2016 Willis Towers Watson Energy Services Survey	Proxy Peer Group of Investor Owned Utilities
AES Corp.	þ		þ
Alliant Energy	þ		
Ameren	þ		þ
American Electric Power Co., Inc.	þ		þ
Calpine Corp.	þ		þ
CenterPoint Energy, Inc.	þ		þ
CMS Energy Corp.	þ		þ
Colorado Springs Utility Consolidated Edison		þ	
Dominion Resources, Inc.	þ		þ
DTE Energy Co.	þ		þ
Duke Energy Corp.	þ		þ
Edison International	þ		þ
Energy Northwest		þ	
Entergy Corp.	þ		þ
Eversource Energy			þ
Exelon Corp.	þ		þ
FirstEnergy Corp.	þ		þ
JEA		þ	
MDU Resources	þ		
New York Power Authority		þ	
NextEra Energy, Inc.	þ		þ
NiSource			þ
NRG Energy			þ
OGE Energy, Inc.	þ		
Omaha Public Power		þ	
Pacific Gas and Electric Co.	þ		þ
Pinnacle West Capital	þ		
PPL Corp.	þ		þ
Public Service Enterprise Group	þ		þ

Inc.  
Puget Sound Energy            b  
Salt River Project                    b  
SCANA                                b  
Sempra Energy                        b                                b  
Southern Company                    b                                b  
TECO Energy                         b  
Wisconsin Energy                     b  
Xcel Energy                            b                                b

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Executive Compensation Program Components

The primary compensation program components for 2017 for the NEOs are summarized in the diagram below and are briefly described in the table and the narrative that follow the diagram.

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Primary Compensation Program Components for Named Executive Officers in 2017

Compensation Component	Objective	Key Features
Annual Salary	Provides fixed base level of compensation to executives to encourage hiring and retention of qualified individuals	<ul style="list-style-type: none"> <li>- Annual salary is targeted at the median (50th percentile) for similar positions at other companies in TVA’s peer group or above the median (50th to 75th percentile) for positions affected by market scarcity, recruitment and retention issues, and other business reasons.</li> <li>- Typically reviewed annually to consider changes in benchmark salaries and/or exceptional individual merit performances.</li> </ul>
Executive Annual Incentive Plan ("EAIP")	Incentivizes performance by providing at-risk compensation tied to attainment of pre-established performance goals for the fiscal year	<ul style="list-style-type: none"> <li>- Annual incentive payouts are based on the results of established goals of an enterprise scorecard, as determined from year to year by the TVA Board or the CEO, as applicable. Annual incentive payouts may be impacted by a corporate multiplier or adjusted by the TVA Board or CEO, as applicable, based on the evaluation of performance during the year.</li> <li>- Target annual incentive opportunities increase with position and responsibility and are based on the opportunities other companies in TVA’s peer group provide to those in similar positions.</li> <li>- Typically reviewed annually to consider changes in benchmark annual incentives.</li> <li>- Participation is limited to key positions that have the ability to significantly impact the long-term financial and/or operational objectives critical to TVA's overall success.</li> </ul>
Long-Term Incentive Plan ("LTIP")	Incentivizes performance and retention by providing performance-based and retention-based grants that are tied to a vesting schedule	<ul style="list-style-type: none"> <li>- LTP awards are granted annually with a three-year vesting cycle. Awards are variable at-risk opportunities based on achieved level of performance (i.e., scorecard results for the three-year performance period).</li> <li>- LTR awards may be granted annually and will vest and pay out in three equal increments annually over three years, subject to the participant being employed through such dates.</li> <li>- Effective October 1, 2015, this plan replaced the ELTIP and LTRIP.</li> </ul>

<p>Pension Plans (Qualified Plans and Supplemental Executive Retirement Plan)</p>	<p>Provides compensation beginning with retirement or termination of employment (if vesting requirements are satisfied) with enhanced compensation for certain executives to provide an additional incentive for hiring and retention of qualified individuals</p>	<ul style="list-style-type: none"> <li>- Broad-based plans available to full-time employees of TVA that are qualified under Internal Revenue Service ("IRS") rules and are similar to the qualified plans provided by other companies in TVA's peer group.</li> <li>- Certain executives in critical positions also participate in a non-qualified pension plan that provides supplemental pension benefits at compensation levels that are higher than the limits specified by IRS regulations for qualified pension plans. These supplemental benefits are comparable to those provided by other companies in TVA's peer group.</li> <li>- Participation includes executives and select managers in critical positions who make decisions that significantly influence developing and attaining TVA's long-term strategic objectives.</li> </ul>
<p>Executive Long-Term Incentive Plan ("ELTIP")<sup>(1)</sup></p>	<p>Incentivizes performance by providing at-risk compensation tied to attainment of pre-established performance goals for a performance cycle, typically three years</p>	<ul style="list-style-type: none"> <li>- Long-term incentive payouts are based on achievement of performance goals established for a specific, three-year performance cycle and may be adjusted by the TVA Board, based on the evaluation of performance during the cycle.</li> <li>- Effective October 1, 2015, this plan was replaced by the LTIP but will continue to pay out through 2017, subject to the attainment of goals.</li> </ul>
<p>Long-Term Retention Incentive Plan ("LTRIP")<sup>(1)</sup></p>	<p>Incentivizes retention by providing a fixed award at the end of a set period of time, typically three years, if the executive remains employed at the end of the period</p>	<ul style="list-style-type: none"> <li>- Awarded to provide retention incentives to executives similar to those provided by restricted stock or restricted stock units in publicly traded companies.</li> <li>- Grants will vest after a specified period of time, usually no longer than three years.</li> <li>- Effective October 1, 2015, this plan was replaced by the LTIP but will continue to pay out into 2018.</li> </ul>
<p>Long-Term Deferred Compensation Plan ("LTDCP")<sup>(1)</sup></p>	<p>Incentivizes retention by providing a fixed award at the end of a set period of time, typically three to five years, if the executive remains employed at the end of the period</p>	<ul style="list-style-type: none"> <li>- Awarded to provide retention incentives to executives similar to those provided by restricted stock or restricted stock units in publicly traded companies.</li> <li>- Executives generally must remain at TVA for the entire length of the agreement to receive compensation credits.</li> </ul>

- Long-term deferred compensation has been replaced by other long-term compensation programs, and the last LTDCP credits vested in December 2016.

Note

(1) These plans are being phased out.

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Salary. Annual salary is targeted at the median (50th percentile) for similar positions at other companies in TVA's peer group or above the median (50th to 75th percentile) for positions affected by market scarcity, recruitment and retention issues, and other business reasons. In general, salary is reviewed annually with increases awarded based on prior year performance and to bring salaries into alignment with the market.

The salaries of the NEOs for 2017 and 2016 were as follows:

Executive	2017 <sup>(1)</sup>	2016	% change
Mr. Johnson	\$995,000	\$995,000	0.0%
Mr. Thomas	610,018	592,250	3.0%
Mr. Grimes	650,000	600,000	8.3%
Mr. Skaggs	495,285	471,700	5.0%
Ms. Quirk	477,405	463,500	3.0%

Note

(1) All 2017 salary changes were effective on October 1, 2016.

Annual Incentive Compensation. All executives, including the NEOs, participate in the EAIP. The EAIP is designed to encourage and reward executives for successfully achieving annual financial and operational goals. For 2017, an executive's annual incentive payment under the EAIP was calculated as follows:

$$\text{EAIP Amount} = \text{Annual Salary} \times \frac{\text{Annual Target Incentive Opportunity}}{\text{Annual Target Incentive Opportunity}} \times \frac{\text{Percent of Opportunity Achieved (0\% to 150\%)}}{\text{Percent of Opportunity Achieved (0\% to 150\%)}} \times \frac{\text{Corporate Multiplier (0 to 1.00)}}{\text{Corporate Multiplier (0 to 1.00)}} \times \frac{\text{Individual Performance Multiplier (0\% to 125\%)}}{\text{Individual Performance Multiplier (0\% to 125\%)}}$$

Each component of this calculation is discussed below (except for annual salary, which is discussed above).

Annual Target Incentive Opportunity. Annual incentive opportunities for participants in the EAIP generally increase with position and responsibility. For 2017, the TVA Board set Mr. Johnson's target EAIP award opportunity at 150 percent of salary. See Considerations Specific to Mr. Johnson. In October 2016, Mr. Johnson evaluated the appropriateness of the EAIP award opportunities for the other NEOs and made changes as appropriate in order to ensure market competitiveness. Accordingly, target EAIP award opportunities of the NEOs for 2017 were as follows:

Named Executive Officers	2017 Target Annual Incentive Opportunity <sup>(1)</sup>	2016 Target Annual Incentive Opportunity <sup>(1)</sup>
Mr. Johnson	150%	150%
Mr. Thomas	80%	80%
Mr. Grimes	80%	80%
Mr. Skaggs	80%	70%
Ms. Quirk	70%	65%

Note

(1) Represents a percent of each NEO's salary.

Percent of Opportunity Achieved. The TVA Board and CEO worked together to establish one organizational scorecard for the 2017 EAIP (TVA Enterprise Scorecard). The scorecard was also used to determine annual incentive payouts for all non-executive TVA employees who participated in TVA's 2017 Winning Performance Team Incentive Plan ("WPTIP").

Once scorecard results were calculated, the CEO, after consulting with the TVA Board, rounded the scorecard results and recommended payout at 103 percent. The Chair of the TVA Board, in consultation with the committee and with input from the individual members of the TVA Board, then recommended and approved an identical rounded payout of 103 percent for the CEO.





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The goals and associated weightings for the scorecard and the adjusted results achieved follows:

TVA 2017 Enterprise Scorecard

Notes

(1) Load Not Served ("LNS") is equal to the product of (i) the percentage of total load not served (the amount of load that would have been delivered had the interruption not occurred is estimated in MWhs) and (ii) the number of minutes in the period during which load was not served (excluding interruptions because of declared major events). Value is expressed in system minutes. One system minute is in effect the total amount of load that TVA serves during an average minute during the fiscal year.

(2) TVA Total Spending is defined as non-fuel operating & maintenance ("O&M") expense plus capital expense plus non-fuel inventory expense for corporate and operational organizations.

(3) Nuclear Unit Capability Factor ("UCF") is the ratio of available energy generation during 2017 to the reference energy generation over the same time period.

(4) Coal Seasonal Equivalent Forced Outage Rate measures the generation lost because of forced events as a percentage of time a unit would have been scheduled to run. This indicator is for the months of December to March and June to September for 2017 and includes all coal-fired plants.

(5) Combined Cycle Seasonal Equivalent Forced Outage Rate measures the generation lost because of forced events as a percentage of time a unit would have been scheduled to run. This indicator is for the months of December to March and June to September for 2017 and includes Caledonia, John Sevier, Lagoon Creek, Magnolia, and Southaven Combined Cycle Plants.

(6) Projects Milestones are defined for projects considered critical to achieving the TVA mission (capacity expansion, major regulatory projects, major maintenance projects, and coal combustion residuals projects).

Corporate Multiplier. The TVA Board approved the use of a corporate multiplier for the WPTIP and EAIP. The corporate multiplier ranges between 0 and 1.0 and can be used only for purposes of reducing the amount of the award. For 2017, the TVA Board determined that the corporate multiplier should be 1.0 based on the following:

• Safety better than top decile and best in last ten years;

• Strong financial performance, including an additional \$500 million contribution to TVA's qualified pension plan;

• Solid economic development and capital investment; and

• Zero Board level significant events.

Notes

(1) Recordable Incident Rate is defined as the number of recordable injuries (as defined by TVA's safety program) per 200,000 employee-hours worked by TVA employees and staff augmentation contractors (excluding hearing events).

(2) Total Financing Obligations and Liabilities is calculated by subtracting contributions to unfunded liabilities from the sum of (1) long-term debt, net (including unamortized premiums/discounts), (2) short-term debt, net, (3) leaseback obligations, (4) energy prepayment obligations, and (5) variable interest entities.

(3) Operating Cash Flow is the amount of cash generated from power production and other mission-related activities. It is generally defined as operating revenues received less cash payments made for operating expenses.

(4) Net Income consists of the organization's net earnings derived by adjusting revenues for the cost of doing business, including the cost of sales, depreciation, interest, taxes, and other expenses.

(5) Jobs Created and Retained measures the number of new or retained jobs in the Tennessee Valley for which TVA has played a role in the recruitment or retention of the economic development project.

(6) Board Level Significant Events include items deemed materially significant to the TVA Board and that affect TVA's reputation with its customers and its stakeholders, the organizational health of the workforce, or TVA's impact on the public at large.

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Individual Performance Multiplier. The 2017 EAIP maintained the CEO's discretion to adjust individual incentive awards based on subjective assessments of individual performance during 2017. Once all other preliminary 2017 EAIP payouts were calculated and the corporate multiplier was applied, Mr. Johnson, as CEO, and in consultation with the Committee, evaluated each NEO's performance (except his own) to determine whether any upward or downward adjustment should be made to the final annual incentive award of the participants. No additional adjustments were made to these awards.

In addition, the Board Chair, in consultation with the Committee and with input from individual members of the TVA Board, evaluated Mr. Johnson's performance as CEO during 2017 to determine whether any adjustment should be made to his incentive award under the EAIP. Based on this review, the Board Chair decided that Mr. Johnson's final annual incentive award should be adjusted 110 percent based on TVA's 2017 performance, including strong financial results, improvement in broad-based worker safety performance, progress on rates and O&M spending, improvement in customer loyalty and stakeholder relationships, economic development, and investment in the Tennessee Valley. Additionally, there was improved overall operational performance of TVA's nuclear fleet.

EAIP Payouts. As a result of the above process, the NEOs were awarded the following EAIP payouts for 2017 in comparison to the 2017 target payouts:

2017 EAIP Payouts

Named Executive Officers	Salary	Target EAIP Incentive Opportunity		Scorecard Results After Application of Corporate Multiplier	Individual Performance Multiplier	Actual EAIP Payment
		(% of Salary)	Target EAIP Payout			
William D. Johnson	\$995,000	150%	\$1,492,500	103%	110%	\$1,691,003
John M. Thomas, III	610,018	80%	488,014	103%	100%	502,654
Joseph P. Grimes, Jr.	650,000	80%	520,000	103%	100%	535,600
Michael D. Skaggs	495,285	80%	396,228	103%	100%	408,115
Sherry A. Quirk	477,405	70%	334,184	103%	100%	344,210

Awards to the NEOs under the EAIP for 2017 are reported in the "Non-Equity Incentive Plan Compensation" column in the Summary Compensation Table.

Long-Term Incentive Compensation. In addition to the EAIP, certain executives in critical positions, including the Named Executive Officers, participate in the company's long-term compensation plans. These individuals make decisions that significantly influence the development and execution of TVA's long-term strategic objectives. As such, the long-term compensation plans are designed to reward executives for helping TVA improve in areas directly related to TVA's long-term success by:

- Using enterprise-wide performance criteria that are directly aligned with TVA's mission;
- Using a "cumulative" performance approach to measure performance achieved over a three-year period with a new three-year performance cycle beginning each year;
- Using a potential payment range of 50 percent to 150 percent of target incentive opportunity to enable awards that are commensurate with performance achievements; and

Targeting award opportunities for each performance cycle at levels that approximate median levels of competitiveness with TVA's peer group and incorporating the Committee's policy that (i) approximately 70 to 80 percent of each executive's total long-term incentive opportunity be performance-based (under the ELTIP and performance-based awards under the LTIP) and (ii) approximately 20 to 30 percent of each executive's total long-term incentive opportunity be retention-oriented under the LTRIP or retention awards under the LTIP as described below under the heading "Long-Term Retention Arrangements."

LTIP. Effective October 1, 2015, TVA adopted the LTIP. The LTIP combines and replaces both the ELTIP, which provides for performance-based awards, and the LTRIP, which provides for time-based retention awards. The purpose of the LTIP is to provide a cohesive total long-term compensation opportunity through the granting of (1) variable, at-risk long-term performance-based awards and (2) long-term retention awards. Participants may receive both types of awards. For participants who have been granted both types of awards, the retention awards will typically be targeted at 20 percent to 30 percent of each participant's total targeted long-term compensation. The remaining 70 percent to 80 percent of long-term compensation will be in the form of performance-based awards.

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Effective October 1, 2016, TVA granted the following LTP awards:

Named Executive Officers LTP/Long-Term Performance Grant <sup>(1)</sup>

Mr. Johnson	\$2,427,800
Mr. Thomas	750,000
Mr. Grimes	750,000
Mr. Skaggs	750,000
Ms. Quirk	675,000

Note

(1) All awards vest September 30, 2019, and the actual amount the executives receive upon payout may vary based on organizational performance under the LTIP.

LTP awards will be included in the "Non-Equity Incentive Plan Compensation" column in the Summary Compensation Table in the year in which they vest. See "Long-Term Retention Arrangements - LTIP" below for a discussion of the LTR awards that TVA granted under the LTIP effective October 1, 2016.

ELTIP. Although TVA's LTIP replaced the ELTIP, the ELTIP still covered the 2015 - 2017 performance period.

Under the ELTIP, an executive's incentive payment is calculated as follows:

$$\text{ELTIP Payout} = \text{Salary} \times \frac{\text{Target ELTIP Incentive Opportunity}}{\text{Opportunity}} \times \frac{\text{Percent of Opportunity Achieved}}{\text{Achieved}}$$

For the 2015-2017 performance period, the target ELTIP incentive opportunity for each of the Named Executive Officers was as follows.

Named Executive Officers Target Long-Term Incentive Opportunity <sup>(1)</sup>

Mr. Johnson	175%
Mr. Thomas	120%
Mr. Grimes	110%
Mr. Skaggs	90%
Ms. Quirk	120%

Note

(1) Represents a percent of each Named Executive Officer's salary.

In November 2016, the TVA Board reviewed the market competitiveness of Mr. Johnson's ELTIP opportunity and determined that no changes were necessary. See Considerations Specific to Mr. Johnson. Mr. Johnson evaluated the appropriateness of the ELTIP award opportunities for Mr. Thomas, Mr. Grimes, Mr. Skaggs, and Ms. Quirk and made no changes as the opportunities were competitive with regard to the market.

2015 - 2017 Performance Cycle

For the three-year cycle ended September 30, 2017, the TVA Board approved three overall long-term incentive measures of TVA performance to be applied to all participants in the ELTIP:

◆ Wholesale Rate Excluding Fuel;

● Load Not Served (the product of the percentage of total load-not-served multiplied by the number of minutes in the period); and

● External Measures (including external nuclear performance indicators, stakeholder survey, media tone, customer loyalty, and Board level significant events).

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The Wholesale Rate Excluding Fuel performance measure reflects TVA's annual non-fuel electric revenues divided by TVA's annual power sales. These targets are based upon TVA's revenue requirements and sales projections with the ultimate goal of keeping customer rates as low as feasible, with a threshold goal of 4.84, a target goal of 4.74, and a stretch goal of 4.65.

The Load Not Served performance measure reflects the percentage of total load not served multiplied by the number of minutes in the period (with the value expressed in system minutes and excluding events during declared major storms) during the three-year cycle ended September 30, 2017, with a threshold goal of 7.9 (99.999 percent reliability), a target goal of 5.5 (75th

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percentile), and a stretch goal of 4.0 (90th percentile). Load Not Served events caused by TVA on a distributor system will also count as a TVA event even if TVA's system remains energized.

The External Measures represent TVA's performance in areas including external nuclear performance indicators, stakeholder survey, media tone, customer loyalty, and Board level significant events. Targets for the External Measures are based on making incremental improvements in external perceptions of TVA's performance and brand. The nuclear performance measure was based on 2017 results, with a threshold goal of 86.4 (bottom quartile), a target goal of 89.4 (between bottom quartile and median), and a stretch goal of 92.4 (between median and top quartile). The media tone, stakeholder survey, customer survey, and Board level significant events measures were calculated using an average of the 2015, 2016, and 2017 results. The media tone measure had a threshold goal of 83, a target goal of 87, and a stretch goal of 88. The stakeholder survey measure had a threshold goal of 81.5, a target goal of 82.3, and a stretch goal of 83.2. The customer survey measure had a threshold goal of 51.3, a target goal of 52.3, and a stretch goal of 53.3. The Board level significant events measure had a threshold goal of two unfavorable events, a target goal of zero events, and a stretch goal of two favorable events.

The following table shows the performance goals and weighting and percent of opportunity achieved for the ELTIP for the three-year cycle ended September 30, 2017:

Note

(1) On August 25, 2016, the TVA Board revised (1) the method for calculating the external nuclear performance indicators measure and (2) the goals related to this measure. The changes were adopted because the external party that rates the performance of TVA's nuclear fleet revised the industry standard metric for its rating index and provided new guidance on reporting requirements related to the addition of Watts Bar Unit 2 into TVA's nuclear fleet.

Highlights of the 2015 - 2017 performance period include:

- ◆ Wholesale rate impacted by the pattern of weather peaks in 2015 and 2016 and lower than plan sales in 2017;
- ◆ Load not served better than top quartile; and
- ◆ Favorable external measures (reputation and perception of TVA).

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As a result, the NEOs were awarded the following ELTIP payouts for the 2015 - 2017 performance cycle in comparison to the 2015 - 2017 performance cycle target payouts:

## 2015 - 2017 Performance Cycle ELTIP Payouts

Named Executive Officers	Salary	Target ELTIP Incentive Opportunity	Target ELTIP Payout	Percent of Opportunity Achieved	ELTIP Payout
William D. Johnson	\$995,000	175%	\$1,741,250	103%	\$1,793,488
John M. Thomas, III	610,018	120%	732,022	103%	753,983
Joseph P. Grimes, Jr.	650,000	110%	715,000	103%	736,450
Michael D. Skaggs	495,285	90%	445,757	103%	459,130
Sherry A. Quirk	477,405	120%	509,238 <sup>(1)</sup>	103%	524,515

## Note

(1) Amount prorated based on the number of months participating in the performance period. Ms. Quirk participated in 32 out of 36 months in the performance period as a result of her hire date.

Awards to the NEOs under the ELTIP for the performance cycle that ended September 30, 2017, are reported in the "Non-Equity Incentive Plan Compensation" column in the Summary Compensation Table.

## 2016 - 2018 Performance Cycle

The TVA Board approved the following overall measures of TVA performance for all participants in the LTIP for the three-year cycle ending September 30, 2018 (awards to be paid in November 2018):

Performance Measure	Weight	Threshold (50%)	Target (100%)	Stretch (150%)
Wholesale Rate Excluding Fuel <sup>(1)</sup>	40%	Target + 2%	2016 - 2018 average rate based on business plans	Target - 2%
Load Not Served <sup>(2)</sup>	30%	99.999% reliability or better	Top quartile	Better than top quartile
External Measures <sup>(3)</sup>	30%	80.0	88.0	95.5

## Notes

(1) The Wholesale Rate Excluding Fuel measure represents TVA's electric sales revenue excluding fuel divided by electric power sales. For the 2016-2018 LTIP performance cycle, the Wholesale Rate Excluding Fuel measure will be calculated using an average of the 2016, 2017, and 2018 results. The target Wholesale Rate Excluding Fuel measure is the average of the rates for 2016, 2017, and 2018 that were set forth in the approved business plans for 2014, 2015, and 2016, respectively.

(2) Load Not Served is equal to the product of (i) the percentage of total load not served and (ii) the number of minutes in the period (excluding events during declared major storms). Value is expressed in system minutes and is the average of the three years within the LTIP performance cycle. Load Not Served events caused by TVA on a distributor system will also count as a TVA event even if TVA's system remains energized. For the 2016-2018 LTIP performance cycle, the Load Not Served measure will be calculated using an average of the 2016, 2017, and 2018 results.

(3) For the 2016-2018 LTIP performance cycle, the External Measures metric will be calculated using an average of the 2016, 2017, and 2018 results, except for the external performance indicators for the TVA nuclear fleet, which will be based only on 2018 results. On August 25, 2016, the TVA Board revised (1) the method for calculating the external performance indicators for the TVA nuclear fleet measure and (2) the goals related to this measure. The changes were adopted because the external party that rates the performance of TVA's nuclear fleet revised the industry standard



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metric for its rating index and provided new guidance on reporting requirements related to the addition of Watts Bar Unit 2 into TVA's nuclear fleet.

2017 - 2019 Performance Cycle

The TVA Board approved the following overall measures of TVA performance for all participants in the LTIP for the three-year cycle ending September 30, 2019 (awards to be paid in November 2019):

Performance Measure	Weight	Threshold (50%)	Target (100%)	Stretch (150%)
Wholesale Rate Excluding Fuel <sup>(1)</sup>	40%	Target + 2%	2017 - 2019 average rate based on business plans	Target - 2%
		4.8	4.0	3.5
Load Not Served <sup>(2)</sup>	30%	Between top quartile and top decile	2017 - 2019 average rate based on business plans	Better than top decile
External Measures <sup>(3)</sup>	30%	80.6	88.4	96.1

Notes

(1) The Wholesale Rate Excluding Fuel measure represents TVA's electric sales revenue excluding fuel divided by electric power sales. For the 2017-2019 LTIP performance cycle, the Wholesale Rate Excluding Fuel measure will be calculated using an average of the 2017, 2018, and 2019 results. The target Wholesale

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Rate Excluding Fuel measure is the average of the rates for 2017, 2018, and 2019 that were set forth in the approved business plans for 2015, 2016, and 2017, respectively.

(2) Load Not Served is equal to the product of (i) the percentage of total load not served and (ii) the number of minutes in the period (excluding events during declared major storms). Value is expressed in system minutes and is the average of the three years within the LTIP performance cycle. Load Not Served events caused by TVA on a distributor system will also count as a TVA event even if TVA's system remains energized. For the 2017-2019 LTIP performance cycle, the Load Not Served measure will be calculated using an average of the 2017, 2018, and 2019 results. The target Load Not Served measure is the average of the rates for 2017, 2018, and 2019 that were set forth in the approved business plans for 2015, 2016, and 2017, respectively.

(3) For the 2017-2019 LTIP performance cycle, the External Measures metric will be calculated using an average of the 2017, 2018, and 2019 results. On August 25, 2016, the TVA Board revised (1) the method for calculating the external performance indicators for the TVA nuclear fleet measure and (2) the goals related to this measure. The changes were adopted because the external party that rates the performance of TVA's nuclear fleet revised the industry standard metric for its rating index and provided new guidance on reporting requirements related to the addition of Watts Bar Unit 2 into TVA's nuclear fleet.

Long-Term Retention Arrangements. As a corporate agency of the United States, TVA does not have equity securities that it can use to provide stock awards, options, or other equity-based awards as compensation for its employees. To help retain leaders, TVA enters into long-term retention arrangements with certain executives, including the NEOs. In recent years, these arrangements were administered under either the LTDCP or the LTRIP. As discussed previously, however, effective October 1, 2015, TVA adopted the LTIP, which provides for retention awards in addition to performance-based awards and replaces the LTRIP and the LTDCP. The purpose of the LTDCP, the LTRIP, and the retention awards under the LTIP is to provide a retention incentive similar to restricted stock or restricted stock units. The arrangements are intended to encourage executives to remain with TVA and to provide, in combination with salary, EAIP, and long-term incentive compensation (ELTIP incentive awards or LTP grants), a competitive level of total direct compensation. Awards under the arrangements are designed to constitute approximately 20 to 30 percent of each NEOs total long-term compensation.

LTDCP. Under the LTDCP, credits were made to an account in an executive's name (typically on an annual basis) for a predetermined period. If the executive remained employed at TVA until the end of the period (typically three to five years), the executive became vested in the balance of the account, including any return on investment on the credits in the account, and received a distribution in accordance with a deferral election made at the time the LTDCP agreement was made. The default return on investment on the credits in executives' accounts was interest calculated based on the composite rate of all marketable U.S. Treasury issues and credited daily to the balance reflected in the executives' accounts. Executives could alternatively choose to have their balances adjusted based on the return on certain mutual funds.

LTRIP. Under the LTRIP, awards were granted to participants, and each award represented the right of a participant to receive a lump sum cash payment. On the grant date, the award set forth a specified date on which the award would become fully vested. The period from the grant date to the vesting date was typically three years, although it might be as short as two years. Each award will be paid in a lump sum as soon as practical after the vesting date, and no interest will accrue on the award during the vesting period. Although the LTIP replaced the LTRIP, awards previously granted under the LTRIP are scheduled to vest through December 31, 2017.

LTIP. The LTIP is designed to provide officers and other participants with time-based incentive opportunities designed to encourage them to remain with TVA over an extended period of time. Retention awards granted under the LTIP have a vesting period covering three years. Awards are generally granted on October 1 and will become one-third vested on each subsequent September 30, provided the participant remains employed through that date. Each award will be paid in a lump sum within two months of vesting.

Following the market assessment conducted by FW Cook, effective October 1, 2016, TVA granted the following retention-based awards under the LTIP in order to maintain competitive long-term compensation:

Named Executive Officers LTR/Long-Term Retention Grant <sup>(1)</sup>

Mr. Johnson	\$606,950
Mr. Thomas	250,000
Mr. Grimes	260,000
Mr. Skaggs	250,000
Ms. Quirk	225,000

Note

(1) All awards vested 1/3 September 30, 2017, and will vest 1/3 September 30, 2018, and 1/3 September 30, 2019, subject to the participant being employed through each such date.

The portion of the LTR grants that vested in 2017 are reported in the "Non-Equity Incentive Plan Compensation" column in the Summary Compensation Table.

Considerations Specific to Mr. Johnson. At the beginning of 2017, the Committee, in consultation with its independent executive compensation consultant, FW Cook, evaluated Mr. Johnson's overall performance and compensation opportunity relative to TVA's peer group to determine whether to recommend adjustments to Mr. Johnson's compensation to the TVA Board for 2017. After a thorough review, including the consideration of CEO median compensation data, the Committee recommended that the TVA Board approve compensation and incentive opportunity changes for Mr. Johnson for 2017. The 2017 compensation

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package for Mr. Johnson consisted of the following components: annual salary of \$995,000, a target EAIP incentive opportunity of 150 percent of salary, a target ELTIP incentive opportunity of 175 percent of salary, a LTP grant of \$2,427,800, and a LTR grant of \$606,950. The ELTIP target opportunity of 175 percent will apply to the 2015 - 2017 performance cycle. The LTP grant was effective October 1, 2016 and vests September 30, 2019, provided certain performance targets are achieved and he is still employed on this date. The LTR grant was effective October 1, 2016, and vests in three equal increments on September 30, 2017, 2018 and 2019. The Committee made its recommendation based on the special place and mission of TVA and the belief that the structure of Mr. Johnson's compensation opportunity should have a larger component of "at risk" compensation than any other TVA executive (approximately 72 percent of overall target total direct compensation).

Additionally, on December 12, 2016, the Board approved a performance incentive arrangement ("PIA") under which Mr. Johnson is entitled to receive a cash award of up to \$200,000 per year based on the evaluation of his performance commencing in 2017.

The chart below compares (i) the total direct compensation earned by Mr. Johnson for 2017; (ii) the 2017 compensation opportunity approved by the TVA Board for Mr. Johnson; and (iii) the CEO median compensation data provided to the Committee by FW Cook, based on TVA's peer group as discussed above.

## CEO Peer Group Compensation Comparison

Compensation Component	TVA CEO Johnson Actual Compensation for 2017	TVA CEO Johnson Target Compensation Opportunity for 2017	Willis Towers Watson Chief Executive Officer Median Market Data (TVA Peer Group) <sup>(1)</sup>
Base Salary	\$995,000	\$995,000	\$1,221,000
Total Annual Incentive	190 %	(2) 170 %	(2) 115 %
Total Cash Compensation ("TCC")	\$2,886,003	\$2,687,500	\$2,692,000
Total Long-Term Incentive Compensation	220 %	(3) 214 %	(3) 471 %
Total Direct Compensation ("TDC")	\$5,070,857	\$4,820,116	\$8,391,000

Notes  
(1) Market assessment effective October 2016 and included market composite of Willis Towers Watson database and proxy peer group.

(2) Mr. Johnson's target EAIP award for 2017 was 150 percent of \$995,000, and he was eligible for an additional \$200,000 under a PIA. TVA's Enterprise Scorecard result was 103 percent, and he had an Individual Performance Multiplier of 110 percent of his award. Additionally, he was awarded the full \$200,000 under the PIA.

(3) For the 2015-2017 ELTIP performance cycle, Mr. Johnson's target ELTIP award was 175 percent of \$995,000, and his actual award was 103 percent of this amount. Mr. Johnson also had two tranches of LTR grants vest (\$189,050 and \$202,316) on September 30, 2017, for a total of \$391,366.

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Retirement Benefits. During 2017, the TVA Retirement System administered three retirement benefit structures for eligible employees:

Original Benefit Structure ("OBS") for employees covered under the plan prior to January 1, 1996, with a pension based on a final average pay formula.

Cash Balance Benefit Structure ("CBBS") for employees first hired on or after January 1, 1996, and prior to July 1, 2014, with a pension based on an account that consists of pay credits and interest on such credits. Certain participants no longer receive pay credits, but all participants still receive interest on their pay credits. See the discussion following the Pension Benefits Table for additional information regarding pay credits and interest on pay credits.

Employer Automatic Benefit Structure ("EABS") for employees who were first hired on or after July 1, 2014, or who were rehired on or after July 1, 2014, but who were previously not vested or who previously received their pension benefit in a lump-sum distribution. EABS members are eligible for a defined contribution retirement benefit in the 401(k) plan only and are not eligible to participate in the defined benefit plan.

In addition to these plans, TVA also offered during 2017 a 401(k) plan which provided the following benefits:

For OBS members, TVA provides matching contributions of 25 cents on every dollar up to 1.5 percent of eligible compensation.

For CBBS members, TVA provides matching contributions for all members and automatic, non-elective contributions for certain members. See the discussion following the Pension Benefits Table for additional information regarding these contributions.

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• For EABS members, TVA provides an automatic, non-elective contribution of 4.5 percent of eligible compensation and matching contributions of 75 cents on every dollar up to 4.5 percent of eligible compensation.

The availability of, and level of benefits provided by, these qualified plans are comparable to similar qualified plans provided by companies in TVA's peer group.

In addition to its qualified retirement plans, TVA has a Supplemental Executive Retirement Plan ("SERP") for selected executives who are critical to the ongoing success of the enterprise. TVA's SERP is a non-qualified plan similar to those used by most other companies in its peer group. The purpose of the SERP is to:

• Provide a competitive retirement benefit level that cannot be delivered solely through TVA's qualified retirement plans due to IRS limitations.

• Provide a benefit level (as a percentage replacement of pre-retirement pay) that is more comparable to that of employees who are not subject to the IRS limitations.

Because "compensation" as calculated for purposes of the SERP benefit includes EAIP awards earned by the participants, the SERP benefits are somewhat sensitive to TVA's performance achievements. Also, discretionary actions by the TVA Board or the CEO to reduce EAIP payouts could reduce SERP benefits.

More information regarding these retirement and pension plans is found following the Pension Benefits Table.

Health and Other Benefits. TVA offers a group of health and other benefits (medical, dental, vision, life and accidental death and disability insurance, and long-term disability insurance) that are available to a broad group of employees. The NEOs are eligible to participate in TVA's health benefit plans and other non-retirement benefit plans on the same terms and at the same contribution rates as other TVA employees.

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Executive Compensation Tables and Narrative Disclosures

Summary Compensation and Grants of Plan-Based Awards

The following table provides information on compensation earned by each of the Named Executive Officers in 2017 (and 2016 and 2015, as applicable).

Summary Compensation Table

Name and Principal Position	Year	Salary (\$)	Bonus (\$)	Stock Award (\$)	Option Award (\$)	Non-Equity Incentive Plan Compensation (\$) <sup>(1)</sup>	Change in Pension Value and Nonqualified Deferred Compensation Earnings (\$) <sup>(2)</sup>	All Other Compensation (\$) <sup>(3)</sup>	Total (\$)
William D. Johnson President and Chief Executive Officer	2017	995,000	—	—	—	4,075,857	1,556,084	31,800	6,658,741
	2016	1,002,654	—	—	—	3,906,619	<sup>(4)</sup> 1,529,186	<sup>(5)</sup> 11,925	6,450,384
	2015	998,827	—	—	—	3,573,178	<sup>(6)</sup> 1,068,264	<sup>(7)</sup> 761,700	6,401,969
John M. Thomas, III Executive Vice President and Chief Financial Officer	2017	610,018	—	—	—	1,406,637	294,108	19,875	2,330,638
	2016	596,806	—	—	—	1,645,425	<sup>(8)</sup> 631,252	<sup>(9)</sup> 11,925	2,885,408
	2015	577,212	—	—	—	1,317,900	<sup>(10)</sup> 306,185	<sup>(11)</sup> 411,700	2,612,997
Joseph P. Grimes, Jr. Executive Vice President Generation	2017	650,000	—	—	—	1,445,383	311,406	31,800	2,438,589
	2016	604,615	—	—	—	1,254,987	<sup>(12)</sup> 320,593	<sup>(13)</sup> 11,925	2,192,120
	2015	557,135	—	—	—	954,122	<sup>(14)</sup> 268,994	<sup>(15)</sup> 311,700	2,091,951
Michael D. Skaggs Executive Vice President Operations	2017	495,285	—	—	—	1,000,578	352,167	11,925	1,859,955
	2016	475,328	—	—	—	853,282	<sup>(16)</sup> 864,973	<sup>(17)</sup> 161,925	2,355,508
	2015	446,712	—	—	—	785,870	<sup>(18)</sup> 503,274	<sup>(19)</sup> 311,700	2,047,556
Sherry A. Quirk Executive Vice President and General Counsel	2017	477,405	—	—	—	993,725	138,629	23,850	1,633,609
	2016	—	—	—	—	—	—	—	—
	2015	—	—	—	—	—	—	—	—

Note  
(1) The 2017 data is outlined in the table below.

Non-Equity Incentive Plan Compensation

	William D. Johnson	John M. Thomas, III	Joseph P. Grimes, Jr.	Michael D. Skaggs	Sherry A. Quirk
EAIP	\$ 1,691,003	\$ 502,654	\$ 535,600	\$ 408,115	\$ 344,210
ELTIP	1,793,488	753,983	736,450	459,130	524,515
LTR 2015-02 <sup>(A)</sup>	189,050	66,667	86,666	50,000	50,000
LTR 2016-01 <sup>(B)</sup>	202,316	83,333	86,667	83,333	75,000
PIA	200,000	—	—	—	—
Total	\$ 4,075,857	\$ 1,406,637	\$ 1,445,383	\$ 1,000,578	\$ 993,725

(A) LTR grant representing the second tranche of the LTR award effective October 1, 2015.

(B) LTR grant representing the first tranche of the LTR award effective October 1, 2016.

(2) The 2017 data is outlined in the table below.

Change in Pension Value and Nonqualified Deferred Compensation

Earnings

	William D. Johnson	John M. Thomas, III	Joseph P. Grimes, Jr.	Michael D. Skaggs	Sherry A. Quirk
Increase under CBBS	\$3,588	\$15,312	\$2,105	\$37,091	\$—
Increase under SERP	1,552,496	278,796	309,301	315,076	138,629
Total	\$1,556,084	\$294,108	\$311,406	\$352,167	\$138,629



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(3) The 2017 data is outlined in the table below.

## All Other Compensation

	William D. Johnson	John M. Thomas, III	Joseph P. Grimes, Jr.	Michael D. Skaggs	Sherry A. Quirk
401(k) Matching Contribution	\$ 15,900	\$ 11,925	\$ 15,900	\$ 11,925	\$ 11,925
Non-Elective Contribution	15,900	7,950	15,900	—	11,925
Total	\$ 31,800	\$ 19,875	\$ 31,800	\$ 11,925	\$ 23,850

(4) Represents \$1,802,194 awarded under the EAIP, \$1,915,375 awarded under the ELTIP, and \$189,050 awarded under the LTR.

(5) Reflects increases of \$19,235 under the CBBS and \$1,509,951 under the SERP.

(6) Represents \$1,280,565 awarded under the EAIP, \$1,967,613 awarded under the ELTIP, and \$325,000 awarded under a performance incentive arrangement.

(7) Reflects increases of \$17,844 under the CBBS and \$1,050,420 under the SERP.

(8) Represents \$596,988 awarded under the EAIP, \$781,770 awarded under the ELTIP, \$66,667 awarded under the LTR, and \$200,000 awarded under a retention incentive arrangement ("RIA").

(9) Reflects increases of \$35,189 under the CBBS and \$596,063 under the SERP.

(10) Represents \$538,200 awarded under the EAIP and \$779,700 awarded under the ELTIP.

(11) Reflects increases of \$28,797 under the CBBS and \$277,388 under the SERP.

(12) Represents \$442,320 awarded under the EAIP, \$726,000 awarded under the ELTIP, and \$86,667 awarded under the LTR.

(13) Reflects increases of \$18,646 under the CBBS and \$301,947 under the SERP.

(14) Represents \$475,080 awarded under the EAIP and \$479,042 awarded under the ELTIP.

(15) Reflects increases of \$17,865 under the CBBS and \$251,129 under the SERP.

(16) Represents \$336,299 awarded under the EAIP, \$466,983 awarded under the ELTIP, and \$50,000 awarded under the LTR.

(17) Reflects increases of \$48,505 under the CBBS and \$816,468 under the SERP.

(18) Represents \$333,305 awarded under the EAIP and \$452,565 awarded under the ELTIP.

(19) Reflects increases of \$38,269 under the CBBS and \$465,005 under the SERP.

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The following table provides information on non-equity incentive plan awards and the possible range of payouts associated with incentives the Named Executive Officers were eligible to receive as of September 30, 2017, in the performance cycles ending on September 30, 2017, 2018, and 2019. Awards under the EAIP, ELTIP, LTR, and PIA that vested as of September 30, 2017, will be paid in cash during the first quarter of 2018.

Grants of Plan-Based Awards Table  
as of September 30, 2017

Name	Plan	Estimated Possible Payouts Under Non-Equity Incentive Plan Awards <sup>(1)</sup>			Estimated Future Payouts Under Non-Equity Incentive Plan Awards <sup>(1)</sup>			Performance Period Ending/Vesting Date	
		Threshold <sup>(2)</sup> (\$)	Target <sup>(2)</sup> (\$)	Maximum <sup>(2)</sup> (\$)	Threshold <sup>(2)</sup> (\$)	Target <sup>(2)</sup> (\$)	Maximum <sup>(2)</sup> (\$)		
William D. Johnson	EAIP <sup>(3)</sup>	\$746,250	\$1,492,500	\$2,238,750				09/30/2017	
	ELTIP <sup>(4)</sup>	\$870,625	\$1,741,250	\$2,611,875				09/30/2017	
	LTR 2015-02 <sup>(5)</sup>		\$189,050	\$189,050				09/30/2017	
	LTR 2016-01 <sup>(5)</sup>		\$202,316	\$202,316				09/30/2017	
	PIA <sup>(6)</sup>			\$200,000				09/30/2017	
	LTP <sup>(7)</sup>				\$1,134,300	\$2,268,600	\$3,402,900	09/30/2018	
	LTR 2015-03 <sup>(5)</sup>					\$189,050	\$189,050	09/30/2018	
	LTR 2016-02 <sup>(5)</sup>					\$202,317	\$202,317	09/30/2018	
	PIA <sup>(6)</sup>						\$200,000	09/30/2018	
	LTP <sup>(8)</sup>				\$1,213,900	\$2,427,800	\$3,641,700	09/30/2019	
	LTR 2016-03 <sup>(5)</sup>					\$202,317	\$202,317	09/30/2019	
	PIA <sup>(6)</sup>						\$200,000	09/30/2019	
	John M. Thomas, III	EAIP <sup>(3)</sup>	\$244,007	\$488,014	\$732,021				09/30/2017
		ELTIP <sup>(4)</sup>	\$366,011	\$732,022	\$1,098,033				09/30/2017
LTR 2015-02 <sup>(5)</sup>			\$66,667	\$66,667				09/30/2017	
LTR 2016-01 <sup>(5)</sup>			\$83,333	\$83,333				09/30/2017	
LTP <sup>(7)</sup>					\$357,500	\$715,000	\$1,072,500	09/30/2018	
LTR 2015-03 <sup>(5)</sup>						\$66,667	\$66,667	09/30/2018	
LTR 2016-02 <sup>(5)</sup>						\$83,333	\$83,333	09/30/2018	
LTP <sup>(8)</sup>					\$375,000	\$750,000	\$1,125,000	09/30/2019	
						\$83,334	\$83,334	09/30/2019	
								09/30/2019	

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	LTR 2016-03 <sup>(5)</sup>						
Joseph P. Grimes, Jr.	EAIP <sup>(3)</sup>	\$ 260,000	\$ 520,000	\$ 780,000			09/30/2017
	ELTIP <sup>(4)</sup>	\$ 357,500	\$ 715,000	\$ 1,072,500			09/30/2017
	LTR 2015-02 <sup>(5)</sup>	\$ 86,666	\$ 86,666				09/30/2017
	LTR 2016-01 <sup>(5)</sup>	\$ 86,667	\$ 86,667				09/30/2017
	LTP <sup>(7)</sup>			\$ 375,000	\$ 750,000	\$ 1,125,000	09/30/2018
	LTR 2015-03 <sup>(5)</sup>			\$ 86,666	\$ 86,666		09/30/2018
	LTR 2016-02 <sup>(5)</sup>			\$ 86,667	\$ 86,667		09/30/2018
	LTP <sup>(8)</sup>			\$ 375,000	\$ 750,000	\$ 1,125,000	09/30/2019
	LTR 2016-03 <sup>(5)</sup>			\$ 86,667	\$ 86,667		09/30/2019
Michael D. Skaggs	EAIP <sup>(3)</sup>	\$ 198,114	\$ 396,228	\$ 594,342			09/30/2017
	ELTIP <sup>(4)</sup>	\$ 222,879	\$ 445,757	\$ 668,636			09/30/2017
	LTR 2015-02 <sup>(5)</sup>	\$ 50,000	\$ 50,000				09/30/2017
	LTR 2016-01 <sup>(5)</sup>	\$ 83,333	\$ 83,333				09/30/2017
	LTP <sup>(7)</sup>			\$ 300,000	\$ 600,000	\$ 900,000	09/30/2018
	LTR 2015-03 <sup>(5)</sup>			\$ 50,000	\$ 50,000		09/30/2018
	LTR 2016-02 <sup>(5)</sup>			\$ 83,333	\$ 83,333		09/30/2018
	LTP <sup>(8)</sup>			\$ 375,000	\$ 750,000	\$ 1,125,000	09/30/2019
	LTR 2016-03 <sup>(5)</sup>			\$ 83,334	\$ 83,334		09/30/2019
Sherry A. Quirk	EAIP <sup>(3)</sup>	\$ 167,092	\$ 334,184	\$ 501,276			09/30/2017
	ELTIP <sup>(9)</sup>	\$ 254,619	\$ 509,238	\$ 763,857			09/30/2017
	LTR 2015-02 <sup>(5)</sup>	\$ 50,000	\$ 50,000				09/30/2017
	LTR 2016-01 <sup>(5)</sup>	\$ 75,000	\$ 75,000				09/30/2017
	LTP <sup>(7)</sup>			\$ 280,000	\$ 560,000	\$ 840,000	09/30/2018
	LTR 2015-03 <sup>(5)</sup>			\$ 50,000	\$ 50,000		09/30/2018
	LTR 2016-02 <sup>(5)</sup>			\$ 75,000	\$ 75,000		09/30/2018
	LTP <sup>(8)</sup>			\$ 337,500	\$ 675,000	\$ 1,012,500	09/30/2019
	LTR 2016-03 <sup>(5)</sup>			\$ 75,000	\$ 75,000		09/30/2019



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## Notes

- (1) TVA does not have any equity securities and therefore has no equity-based awards.
- (2) Threshold, Target, and Maximum represent amounts that could be earned by a Named Executive Officer based on performance during the applicable performance cycle. Threshold, Target, and Maximum targets for EAIP, ELTIP, and LTIP are 50 percent, 100 percent, and 150 percent.
- (3) Target incentive opportunities as a percentage of salaries were as follows: Mr. Johnson, 150 percent; Mr. Thomas, 80 percent; Mr. Grimes, 80 percent; Mr. Skaggs, 80 percent; and Ms. Quirk, 70 percent. Additionally, a corporate multiplier ranging between 0.00 and 1.00 may be applied which can reduce the award to \$0. An individual performance multiplier of up to 125 percent may also be applied which may increase the award to 187.5 percent of target. Actual EAIP awards earned for performance in 2017 are reported for each of the Named Executive Officers under the "Non-Equity Incentive Plan Compensation" column in the Summary Compensation Table. See Compensation Discussion and Analysis for a discussion of how each award was determined.
- (4) Target incentive opportunities for the three-year performance cycle ended September 30, 2017, as a percentage of salary are as follows: Mr. Johnson, 175 percent; Mr. Thomas, 120 percent; Mr. Grimes, 110 percent; Mr. Skaggs, 90 percent; and Ms. Quirk, 120 percent. ELTIP performance measures for the performance cycle were Wholesale Rate Excluding Fuel, Load Not Served, and External Measures. Actual ELTIP awards earned for the performance cycle ended on September 30, 2017, are reported for each of the Named Executive Officers under the "Non-Equity Incentive Plan Compensation" column in the Summary Compensation Table. See Compensation Discussion and Analysis for a discussion of how each award was determined.
- (5) All LTR awards will be paid in a lump sum within two months of the September 30th vesting date. The awards will be paid in cash after deducting applicable federal, state, and local withholding taxes. In the case of death, the beneficiary will be paid as soon as administratively practicable but in no event later than the last day of the second full calendar month following the participant's death. Disability awards will be paid as soon as administratively practicable but in no event later than the last day of the second full calendar month following the participant's separation from service due to disability. Actual LTR awards earned in 2017 are reported for each of the Named Executive Officers under the "Non-Equity Incentive Plan Compensation" column in the Summary Compensation Table.
- (6) Reflects the maximum award amount Mr. Johnson was eligible to receive under a performance incentive arrangement ("PIA") described in Compensation Discussion and Analysis — Executive Compensation Program Components — Considerations Specific to Mr. Johnson. The actual award to be paid to Mr. Johnson is reported under the "Non-Equity Incentive Plan Compensation" column in the Summary Compensation Table.
- (7) LTP awards were granted October 1, 2015, and will vest September 30, 2018. At the end of the performance period, TVA's Long-Term Incentive Plan Scorecard will be applied to the grants in order to determine award payouts. The final award may be adjusted by the Board based on the evaluation of the participant's individual achievements, peer group comparisons, and performance results over the performance cycle.
- (8) LTP awards were granted October 1, 2016, and will vest September 30, 2019. At the end of the performance period, TVA's Long-Term Incentive Plan Scorecard will be applied to the grants in order to determine award payouts. The final award may be adjusted by the Board based on the evaluation of the participant's individual achievements, peer group comparisons, and performance results over the performance cycle.
- (9) Amount prorated based on the number of months participating in the performance period. Ms. Quirk participated in 32 out of 36 months in the performance period as a result of her hire date.

## Long-Term Retention Arrangements

The following table summarizes the LTDCP, LTRIP, and RIA arrangements with the NEOs. See also the Nonqualified Deferred Compensation Table below for additional information regarding the amounts credited under LTDCP agreements and the Grants of Plan-Based Awards Table for information regarding LTR grants.

## Long-Term Retention Agreements

Name	Plan	Amount	Date of Grant or Credit	Vesting Date
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William D. Johnson	LTDCP \$300,000 <sup>(1)</sup> October 1, 2014	September 30, 2015
	LTRIP \$450,000 <sup>(2)</sup> November 10, 2014	December 31, 2016
John M. Thomas, III	LTDCP \$200,000 <sup>(3)</sup> March 1, 2014	December 31, 2014
	RIA \$200,000 <sup>(4)</sup> January 1, 2015	December 31, 2015
	LTRIP \$200,000 <sup>(2)</sup> January 1, 2015	December 31, 2016
	LTRIP \$200,000 <sup>(2)</sup> January 1, 2015	December 31, 2017
Joseph P. Grimes, Jr.	LTDCP \$250,000 <sup>(5)</sup> September 1, 2013	December 31, 2015
	LTDCP \$150,000 <sup>(5)</sup> January 1, 2014	December 31, 2015
	LTDCP \$150,000 <sup>(5)</sup> January 1, 2015	December 31, 2015
	LTRIP \$150,000 <sup>(2)</sup> June 1, 2014	December 31, 2016
	LTRIP \$150,000 <sup>(2)</sup> January 1, 2015	December 31, 2017
Michael D. Skaggs	LTDCP \$50,000 <sup>(6)</sup> March 1, 2013	December 31, 2016
	LTDCP \$50,000 <sup>(6)</sup> January 1, 2014	December 31, 2016
	LTDCP \$150,000 <sup>(6)</sup> January 1, 2015	December 31, 2016
	LTDCP \$150,000 <sup>(6)</sup> January 1, 2016	December 31, 2016
	LTRIP \$150,000 <sup>(2)</sup> January 1, 2015	December 31, 2017
Sherry A. Quirk	LTRIP \$150,000 <sup>(2)</sup> February 2, 2015	December 31, 2017

Notes

(1) Each credit, and earnings on such credit, were distributed to Mr. Johnson in a lump sum at the time of vesting.

(2) All LTRIP awards shall be paid in a lump sum as soon as practical following the earliest to occur: (a) the normal vesting date, (b) the participant's death, (c) the participant's disability, or (d) the participant's involuntary termination from TVA for reason other than for cause, but in no event shall such payment be made later

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than March 15 of the calendar year following the vesting date. The award shall be paid in cash after deducting the applicable federal, state, and local withholding taxes.

(3) The LTDCP credit and earnings on the credit were paid out in a lump sum upon vesting.

(4) TVA entered into a retention incentive arrangement with Mr. Thomas as of January 1, 2015. Under this arrangement, Mr. Thomas was eligible to receive \$200,000 as long as he remained employed with TVA on December 31, 2015, performed all duties in a highly effective manner, and maintained satisfactory performance through the end of the retention period. These conditions were satisfied, and the retention incentive award was paid to Mr. Thomas within 30 days following the end of the retention period.

(5) Mr. Grimes vested in these credits on December 31, 2015. All vested credits, and earnings on such credits, will be distributed to him in a lump sum following his separation from service with TVA.

(6) Mr. Skaggs vested in these credits on December 31, 2016. All vested credits, and earnings on such credits, will be distributed to him in ten annual installments following his separation from service with TVA.

## Retirement and Pension Plans

The table below provides the actuarial present value of the Named Executive Officers' accumulated benefits, including the number of years of credited service, under TVA's retirement and pension plans as of September 30, 2017, determined using a methodology and interest rate and mortality rate assumptions consistent with those used in the financial statements in this Annual Report, set forth in Note 20.

## Pension Benefits Table

Name	Plan Name	Number of Years of Credited Service <sup>(1)</sup> (#)	Present Value of Accumulated Benefit (\$)	Payments During Last Year (\$)
William D. Johnson	Qualified Plan – CBBS	4.750	<sup>(2)</sup> 74,952	—
	Non-Qualified – SERP Tier	110.750	<sup>(2)</sup> 6,577,807	—
John M. Thomas, III	Qualified Plan – CBBS	11.833	289,640	—
	Non-Qualified – SERP Tier	111.833	2,526,473	—
Joseph P. Grimes, Jr.	Qualified Plan – CBBS	4.083	58,798	—
	Non-Qualified – SERP Tier	14.083	881,404	—
Michael D. Skaggs	Qualified Plan – CBBS	23.583	576,342	—
	Non-Qualified – SERP Tier	123.583	4,142,526	—
Sherry A. Quirk	Qualified Plan – EABS	2.583	—	<sup>(3)</sup> —
	Non-Qualified – SERP Tier	12.583	138,629	—

## Notes

(1) Limited to 24 years when determining supplemental benefits available under SERP Tier 1, described below.

(2) Mr. Johnson will be granted five additional years of credited service for pre-TVA employment if he remains employed with TVA for at least five years and satisfies the minimum five-year vesting requirement, and the offset for prior employer pension benefits associated with the additional five years of credited service will be waived. In addition, the offset for benefits provided under TVA's defined benefit plan will be calculated based on the benefit he would be eligible to receive as a participant in the CBBS taking into account the additional years of credited service being used for SERP benefit calculation purposes. In December 2016, the TVA Board approved amendments to Mr. Johnson's compensation arrangements that provide, among other things, that if Mr. Johnson remains with TVA through calendar year 2018, his SERP benefit will be based on 12 years of credited service (six credited years and six actual years). As of September 30, 2017, the present value of the SERP benefit was \$6,577,807. Without the additional years of credited service, the present value of Mr. Johnson's accumulated benefit would be \$2,936,103.

(3) Ms. Quirk is not eligible to participate in TVARS since she was hired by TVA after June 30, 2014.

## Qualified Retirement Plans

TVA sponsors a qualified defined benefit plan (“pension plan”) and a qualified defined contribution plan (“401(k) plan”), which are administered by the TVA Retirement System (“TVARS”). The retirement benefits for which employees are eligible and receive under the pension plan and 401(k) plan depend on the employee’s hire date and years of service as follows:

Employees who were first hired prior to January 1, 1996, receive (i) a traditional pension benefit calculated based on the employee’s creditable service, the employee’s average monthly salary for the highest three consecutive years of eligible compensation, and a pension factor based on the employee’s age and years of service, less a Social Security offset, and (ii) 401(k) plan matching contributions from TVA. The 401(k) plan matching contribution is \$0.25 on every dollar contributed by the employee up to 1.5 percent of eligible compensation. None of the Named Executive Officers is in this group.

Employees who were first hired prior to January 1, 1996, and who elected to switch pension structures from traditional to cash balance, receive (i) a cash balance pension benefit calculated based on pay-based credits and interest that accrue over time in the employee’s account and the employee’s age at the time of retirement, and (ii) 401(k) plan matching contributions from TVA. The monthly pay credits are equal to 6 percent of eligible compensation, and monthly interest is credited at an annual interest rate equal to the change in the CPI-U plus 3 percent (with a minimum of 6 percent and maximum of 10 percent). The interest rate during 2017 was 6 percent. The 401(k) plan matching contribution is \$0.75 on every dollar contributed by the employee up to 4.5 percent of eligible compensation. Mr. Skaggs is in this group.



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Employees who were first hired on or after January 1, 1996, and who had 10 or more years of service as of October 1, 2016, receive (i) a cash balance pension benefit calculated based on pay-based credits and interest that accrue over time in the employee's account and the employee's age at the time of retirement, and (ii) 401(k) plan non-elective and matching contributions from TVA. The monthly pay credits are equal to 3 percent of eligible compensation, and monthly interest is credited at an annual interest rate equal to the change in the CPI-U plus 2 percent (with a minimum of 5 percent and a maximum of 6.5 percent). The interest rate during 2017 was 5 percent. The 401(k) plan automatic, non-elective contribution is equal to 3 percent of eligible compensation, and the matching contribution is \$0.75 on every dollar contributed by the employee up to 4.5 percent of eligible compensation. Mr. Thomas is in this group.

Employees who were first hired on or after January 1, 1996, and who had less than 10 years of service as of October 1, 2016, receive (i) a cash balance pension benefit calculated based on pay-based credits and interest that accrue over time in the employee's account and the employee's age at the time of retirement, and (ii) 401(k) plan non-elective and matching contributions from TVA. As of October 1, 2016, the cash balance accounts of these employees receive no additional pay-based credits; however, the accounts continue to receive monthly interest credits at an annual interest rate equal to the change in the CPI-U plus 2 percent (with a minimum of 5 percent and a maximum of 6.5 percent). The interest rate during 2017 was 5 percent. The 401(k) plan automatic, non-elective contribution is equal to 6 percent of eligible compensation, and the matching contribution is dollar-for-dollar on employee contributions up to 6 percent of eligible compensation. Mr. Johnson and Mr. Grimes are in this group.

Employees who are first hired on or after July 1, 2014 (or who are rehired and were either previously not vested in the pension plan or cashed out their pension benefit) receive a retirement benefit in the 401(k) plan only. The 401(k) plan automatic, non-elective contribution is equal to 4.5 percent of eligible compensation, and the matching contribution is \$0.75 on every dollar contributed by the employee up to 4.5 percent of eligible compensation. Ms. Quirk is in this group.

Cash Balance Pension Plan. For Named Executive Officers who are eligible for retirement benefits under the pension plan, which includes Mr. Johnson, Mr. Thomas, Mr. Skaggs and Mr. Grimes, eligible compensation is defined as annual salary only for benefit calculation purposes and is shown under the column titled "Salary" in the Summary Compensation Table. The eligible compensation in 2017 could not exceed \$265,000 pursuant to the IRS annual compensation limit applicable to qualified plans. Employees with cash balance benefits who have at least 5 years of cash balance service are eligible at retirement or termination of employment to receive an immediate benefit in the form of a monthly pension with survivor benefit options or in a lump-sum payment with cash out or rollover options. The pension plan does not provide for early retirement benefits to any Named Executive Officer or any other employee eligible for cash balance benefits.

401(k) Plan. All employees eligible to participate in the 401(k) plan, including the Named Executive Officers, may elect to contribute to the 401(k) plan on a before-tax, Roth, and/or after-tax basis. For purposes of matching and non-elective contributions from TVA to the 401(k) accounts of the Named Executive Officers, eligible compensation is defined as annual salary only for benefit calculation purposes and is shown under the column titled "Salary" in the Summary Compensation Table. The eligible compensation in 2017 could not exceed \$265,000 pursuant to the IRS annual compensation limit applicable to qualified plans. Any participant in the 401(k) plan must have 3 years of TVA service to be vested in matching and non-elective contributions from TVA.

### Supplemental Executive Retirement Plan

The SERP is a non-qualified defined benefit pension plan similar to those typically found in other companies in TVA's peer group and is provided to a limited number of executives, including the Named Executive Officers. TVA's SERP was created to recruit and retain key executives. The plan is designed to provide a competitive level of retirement benefits in excess of the limitations on contributions and benefits imposed by TVA's qualified defined

benefit plan and Internal Revenue Code Section 415 limits on qualified retirement plans.

The SERP provides two distinct levels of participation, Tier 1 and Tier 2. Each participant is assigned to one of the two tiers at the time he or she is approved to participate in the SERP. The level of participation ("Tier") defines the level of retirement benefits under the SERP at the time of retirement.

Under the SERP, normal retirement eligibility is age 62 with five years of vesting service. No vested and accrued benefits are payable prior to age 55, and benefits are reduced for retirements prior to age 62. The level of reduction in benefits for retirements prior to age 62 depends on whether a participant's termination is "approved" or "unapproved." In the event of an approved termination of TVA employment, any vested and accrued benefits are reduced by 5/12 percent for each month that the date of benefit commencement precedes the participant's 62nd birthday, up to a maximum reduction of 35 percent. In the event of an unapproved termination of TVA employment, the participant's accrued benefits are first subject to a reduced percentage of vesting if the participant's years of service are between five and ten. At five years of vesting service, the vested percentage of retirement benefits is 50 percent and increases thereafter by 10 percent for each full additional year of service, reaching 100 percent vesting for ten or more years of vesting service. Thereafter, any vested and accrued benefits are reduced by 10/12 percent for each month that the date of benefit commencement precedes the participant's 62nd birthday up to a maximum reduction of 70 percent.

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For purposes of the SERP, an “approved” termination means termination of employment with TVA due to (i) retirement on or after the participant’s 62nd birthday, (ii) retirement on or after attainment of actual age 55, if such retirement has the approval of the TVA Board or its delegate, (iii) death in service as an employee, (iv) disability (as defined under the Rules and Regulations of the TVA Retirement System) as determined by the Retirement Committee, or (v) any other circumstance approved by the TVA Board or its delegate. For purposes of the SERP, an “unapproved” termination means a termination of employment with TVA when such termination does not constitute an “approved” termination as defined in the preceding sentence.

SERP Tier 1. All of the Named Executive Officers are participants in Tier 1. The Tier 1 structure is designed to replace 60 percent of the amount of a participant’s compensation at the time the participant reaches age 62 and has accrued 24 years of TVA service.

Tier 1 benefits are based on a participant’s highest average compensation during three consecutive SERP years and a pension multiple of 2.5 percent for each year of credited service up to a maximum of 24 years. Compensation is defined as salary and EAIP for benefit calculation purposes. Tier 1 benefits are offset by Social Security benefits, benefits provided under TVA’s qualified defined benefit pension plan, and prior employer pension benefits when applicable.

#### Nonqualified Deferred Compensation

The following table provides information regarding deferred contributions, earnings, and balances for each of the Named Executive Officers. The amounts reported under this table do not represent compensation in addition to the compensation that was earned in 2017 and already reported in the Summary Compensation Table, but rather the amounts of compensation earned by the Named Executive Officers in 2017 or prior years that were or have been deferred.

#### Nonqualified Deferred Compensation Table

Name	Executive Contributions in 2017 (\$)	Registrant Contributions in 2017 (\$)	Aggregate Earnings in 2017 <sup>(1)</sup> (\$)	Aggregate Withdrawals/ Distributions (\$)	Aggregate Balance at September 30 2017 <sup>(2)</sup> (\$)
William D. Johnson	—	—	—	—	—
John M. Thomas, III	—	—	—	—	—
Joseph P. Grimes, Jr.	—	—	39,800	—	625,441
Michael D. Skaggs	—	—	322,480	—	4,502,305
Sherry A. Quirk	—	—	—	—	—

#### Notes

(1) Includes vested earnings. Because none of the amounts is above market or preferential earnings under SEC rules, none of these amounts are included in the Summary Compensation Table.

(2) Includes vested contributions and earnings. The following amounts included in this column also have been reported in the Summary Compensation Table as compensation for a prior fiscal year: Mr. Grimes, \$300,000 and Mr. Skaggs, \$600,000.

TVA plans allow participants in the EAIP, ELTIP, the LTDCP, and the performance-based component of the LTIP to defer all or a portion of the compensation earned under those plans and eligible for deferral under plan terms and IRS regulations. All deferrals are credited to each participant in a deferred compensation account, and the deferral amounts are then funded into a rabbi trust. Each participant may elect one or more investment options made available by TVA or allow some or all funds to accrue interest at the rate established by the beginning of each fiscal year equal

to the composite rate of all Treasury issues. Participants may elect to change from either one notional investment option or the TVA interest bearing option to another at any time. Upon termination of employment, funds are distributed pursuant to elections made in accordance with applicable IRS regulations.

Participants in the EAIP, ELTIP, LTDCP, and LTIP, including the Named Executive Officers, were not allowed to elect to defer any portion of their awards received under the plans for 2017.

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## Potential Payments on Account of Retirement/Resignation, Termination without Cause, Termination with Cause, Death, or Disability

The tables below show certain potential payments that would have been made to each Named Executive Officer if his or her employment had been terminated on September 30, 2017, under various scenarios. All of the Named Executive Officers would also be entitled to payments from plans generally available to TVA employees under the specific circumstances of termination of employment, including the health and welfare and pension plans and amounts in the 401(k) plan.

William D. Johnson	Retirement/Resignation	Termination without Cause	Termination with Cause	Death	Disability
Severance Agreement <sup>(1)</sup>	\$ —	\$2,487,500	\$—	\$—	\$—
SERP	\$ 3,015,708	(2) \$6,555,775 (3)	\$3,015,708 (2)	\$6,555,775 (3)	\$6,555,775 (3)
LTRIP	\$ —	\$—	\$—	\$—	\$—
LTR	\$ 391,366	\$391,366	\$391,366	\$685,997 (5)	\$685,997 (6)
LTP	\$ —	\$—	\$—	\$2,321,667 (7)	\$2,321,667 (8)
Deferred Compensation	\$ —	\$—	\$—	\$—	\$—
Total Value of Potential Payments	\$ 3,407,074	\$9,434,641	\$3,407,074	\$9,563,439	\$9,563,439

## Notes

(1) In October 2012, TVA entered into an arrangement with Mr. Johnson that provides a lump-sum payment equal to one year's annual salary and one year's executive annual incentive based on 100 percent target payout in the event TVA terminates his employment without cause. For purposes of this provision, termination without cause includes constructive termination which will be deemed to occur if Mr. Johnson terminates his employment because he is asked to take a new position with TVA with a material reduction in level of authority, duties, compensation, and benefits. This provision will not apply, and no lump-sum payment will be made, in the event Mr. Johnson voluntarily terminates his employment or voluntarily retires, or his employment is terminated "for cause" as defined in the agreement.

(2) In December 2016, the Board approved amendments to Mr. Johnson's compensation arrangements that, among other things, provide that in the event that Mr. Johnson retires or is terminated for cause prior to five years of actual service, the five-year vesting requirement will be waived and he will be entitled to a SERP benefit base on five years of credited service.

(3) The December 2016 amendments to Mr. Johnson's compensation arrangements provide that in the event that Mr. Johnson is terminated without cause prior to five years of actual service, the five-year vesting requirement will be waived and he will be entitled to a SERP benefit based on ten years of credited service.

(4) In the event of death while employed by TVA, the beneficiary will receive a lump sum payment equal to the actuarial equivalent of the benefit that would have been paid had the participant terminated employment on the date of death and elected a joint and 50 percent survivor benefit. Survivor will receive 50% of the reported value.

(5) The LTIP provides that in the event of the death of a participant, the participant's beneficiary is entitled to any portion of a LTR award that had vested at the time of the participant's death but not been paid as well as any portion of a LTR award that would have vested at the end of the fiscal year during which the participant died or at the end of either of the two subsequent fiscal years, provided that the award for each such fiscal year will be prorated based on the number of whole months the participant was employed by TVA during the fiscal year during which he or she died.

(6) The LTIP provides that if a participant separates from service due to a disability, the participant is entitled to any portion of a LTR award that had vested at the time of the separation from service but not been paid as well as any portion of a LTR award that would have vested at the end of the fiscal year during which the participant separated from service or at the end of either of the two subsequent fiscal years, provided that the award for each such fiscal year will be prorated based on the number of whole months the participant was employed by TVA during the fiscal

year during which he or she separated from service.

(7) The LTIP provides that in the event of the death of a participant, the participant's beneficiary is entitled to (1) any portion of a LTP award that had vested at the time of the participant's death but not been paid and (2) any LTP awards that had not vested at the time of the participant's death and that covered a performance cycle for which the participant had received a LTP grant, provided that the amount of any such LTP award (a) will be calculated assuming that the percent of opportunity achieved is 100 percent of target and (b) will be prorated based on the number of whole months the participant was participating in the plan during the applicable performance cycle.

(8) The LTIP provides that if a participant separates from service due to a disability, the participant is entitled to (1) any portion of a LTP award that had vested at the time of the participant's separation from service but not been paid and (2) any LTP awards that had not vested at the time of the participant's separation from service and that covered a performance cycle for which the participant had received a LTP grant, provided that the amount of any such LTP award (a) will be calculated assuming that the percent of opportunity achieved is 100 percent of target and (b) will be prorated based on the number of whole months the participant was employed by TVA during the applicable performance cycle.

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John M. Thomas, III	Retirement/Resignation	Termination without Cause	Termination with Cause	Death	Disability
Severance Agreement <sup>(1)</sup>	\$ —	\$ —	\$ —	\$ —	\$ —
SERP	\$ 2,526,473	(2) \$ 2,526,473 (3)	(2) \$ 2,526,473 (3)	(2) \$ 2,526,473 (5)	(2)(3) \$ 2,526,473
LTRIP	\$ —	\$ 200,000	\$ —	\$ 200,000	\$ 200,000
LTR	\$ 150,000	\$ 150,000	\$ 150,000	\$ 263,889 (6)	\$ 263,889 (7)
LTP	\$ —	\$ —	\$ —	\$ 726,667 (8)	\$ 726,667 (9)
Deferred Compensation	\$ —	\$ —	\$ —	\$ —	\$ —
Total Value of Potential Payments	\$ 2,676,473	\$ 2,876,473	\$ 2,676,473	\$ 3,717,029	\$ 3,717,029

## Notes

(1) Mr. Thomas does not have a severance agreement with TVA.

(2) Represents the present value of the accumulated benefit.

(3) Actual benefit would be paid in five annual installments beginning at age 55.

(4) Assumes that the TVA Board or its delegate determines that the termination is an approved termination under SERP. See Retirement and Pension Plans — Supplemental Executive Retirement Plan above for a discussion of approved and unapproved terminations under SERP.

(5) In the event of death while employed by TVA, the beneficiary would receive a lump sum payment equal to the actuarial equivalent of the benefit that would have been paid had the participant terminated employment on the date of death and elected a joint and 50 percent survivor benefit. Survivor will receive 50% of the reported value.

(6) The LTIP provides that in the event of the death of a participant, the participant's beneficiary is entitled to any portion of a LTR award that had vested at the time of the participant's death but not been paid as well as any portion of a LTR award that would have vested at the end of the fiscal year during which the participant died or at the end of either of the two subsequent fiscal years, provided that the award for each such fiscal year will be prorated based on the number of whole months the participant was employed by TVA during the fiscal year during which he or she died.

(7) The LTIP provides that if a participant separates from service due to a disability, the participant is entitled to any portion of a LTR award that had vested at the time of the separation from service but not been paid as well as any portion of a LTR award that would have vested at the end of the fiscal year during which the participant separated from service or at the end of either of the two subsequent fiscal years, provided that the award for each such fiscal year will be prorated based on the number of whole months the participant was employed by TVA during the fiscal year during which he or she separated from service.

(8) The LTIP provides that in the event of the death of a participant, the participant's beneficiary is entitled to (1) any portion of a LTP award that had vested at the time of the participant's death but not been paid and (2) any LTP awards that had not vested at the time of the participant's death and that covered a performance cycle for which the participant had received a LTP grant, provided that the amount of any such LTP award (a) will be calculated assuming that the percent of opportunity achieved is 100 percent of target and (b) will be prorated based on the number of whole months the participant was participating in the plan during the applicable performance cycle.

(9) The LTIP provides that if a participant separates from service due to a disability, the participant is entitled to (1) any portion of a LTP award that had vested at the time of the participant's separation from service but not been paid and (2) any LTP awards that had not vested at the time of the participant's separation from service and that covered a performance cycle for which the participant had received a LTP grant, provided that the amount of any such LTP award (a) will be calculated assuming that the percent of opportunity achieved is 100 percent of target and (b) will be prorated based on the number of whole months the participant was employed by TVA during the applicable performance cycle.





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Joseph P. Grimes, Jr.	Retirement/Resignation	Termination without Cause	Termination with Cause	Death	Disability
Severance Agreement <sup>(1)</sup>	\$ —	\$ 650,000	\$ —	\$—	\$—
SERP	\$ —	(2) \$—	(2) \$ —	(2) \$ 881,404	(3) (4) \$ 881,404 (3)
LTRIP	\$ —	\$ 150,000	\$ —	\$ 150,000	\$ 150,000
LTR	\$ 173,333	\$ 173,333	\$ 173,333	\$ 303,333	(5) \$ 303,333 (6)
LTP	\$ —	\$—	\$—	\$ 750,000	(7) \$ 750,000 (8)
Deferred Compensation <sup>(9)</sup>	\$ 625,441	\$ 625,441	\$ 625,441	\$ 625,441	\$ 625,441
Total Value of Potential Payments	\$ 798,774	\$ 1,598,774	\$ 798,774	\$ 2,710,178	\$ 2,710,178

## Notes

(1) In June 2013, TVA entered into an arrangement with Mr. Grimes that provides a lump sum payment equal to one year's annual salary in the event TVA terminates Mr. Grimes's employment without cause.

(2) The five-year vesting requirement has not been met.

(3) Represents the present value of the accumulated benefit.

(4) In the event of death while employed by TVA, the beneficiary would receive a lump sum payment equal to the actuarial equivalent of the benefit that would have been paid had the participant terminated employment on the date of death and elected a joint and 50 percent survivor benefit. Survivor will receive 50% of the reported value.

(5) The LTIP provides that in the event of the death of a participant, the participant's beneficiary is entitled to any portion of a LTR award that had vested at the time of the participant's death but not been paid as well as any portion of a LTR award that would have vested at the end of the fiscal year during which the participant died or at the end of either of the two subsequent fiscal years, provided that the award for each such fiscal year will be prorated based on the number of whole months the participant was employed by TVA during the fiscal year during which he or she died.

(6) The LTIP provides that if a participant separates from service due to a disability, the participant is entitled to any portion of a LTR award that had vested at the time of the separation from service but not been paid as well as any portion of a LTR award that would have vested at the end of the fiscal year during which the participant separated from service or at the end of either of the two subsequent fiscal years, provided that the award for each such fiscal year will be prorated based on the number of whole months the participant was employed by TVA during the fiscal year during which he or she separated from service.

(7) The LTIP provides that in the event of the death of a participant, the participant's beneficiary is entitled to (1) any portion of a LTP award that had vested at the time of the participant's death but not been paid and (2) any LTP awards that had not vested at the time of the participant's death and that covered a performance cycle for which the participant had received a LTP grant, provided that the amount of any such LTP award (a) will be calculated assuming that the percent of opportunity achieved is 100 percent of target and (b) will be prorated based on the number of whole months the participant was participating in the plan during the applicable performance cycle.

(8) The LTIP provides that if a participant separates from service due to a disability, the participant is entitled to (1) any portion of a LTP award that had vested at the time of the participant's separation from service but not been paid and (2) any LTP awards that had not vested at the time of the participant's separation from service and that covered a performance cycle for which the participant had received a LTP grant, provided that the amount of any such LTP award (a) will be calculated assuming that the percent of opportunity achieved is 100 percent of target and (b) will be prorated based on the number of whole months the participant was employed by TVA during the applicable performance cycle.

(9) Amounts that Mr. Grimes earned in past years but elected to defer, which are payable pursuant to elections he made and applicable IRS rules.



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Michael D. Skaggs	Retirement/Resignation	Termination without Cause	Termination with Cause	Death	Disability
Severance Agreement <sup>(1)</sup>	\$ —	\$—	\$—	\$—	\$—
SERP	\$ 4,142,526	(2) \$4,142,526 (3)	(2) \$4,142,526 (3)	(2) \$4,142,526 (5)	(2) \$4,142,526 (3)
LTRIP	\$ —	\$ 150,000	\$—	\$ 150,000	\$ 150,000
LTR	\$ 133,333	\$ 133,333	\$ 133,333	\$ 236,111 (6)	\$ 236,111 (7)
LTP	\$ —	\$—	\$—	\$ 650,000 (8)	\$ 650,000 (9)
Deferred Compensation <sup>(10)</sup>	\$ 4,502,305	\$ 4,502,305	\$ 4,502,305	\$ 4,502,305	\$ 4,502,305
Total Value of Potential Payments	\$ 8,778,164	\$ 8,928,164	\$ 8,778,164	\$ 9,680,942	\$ 9,680,942

## Notes

(1) Mr. Skaggs does not have a severance agreement with TVA.

(2) Represents the present value of the accumulated benefit.

(3) Actual benefit would be paid in ten annual installments beginning on the date of Mr. Skaggs's separation from service.

(4) Assumes that the TVA Board or its delegate determines that the termination is an approved termination under SERP. See Retirement and Pension Plans — Supplemental Executive Retirement Plan above for a discussion of approved and unapproved terminations under SERP.

(5) In the event of death while employed by TVA, the beneficiary would receive a lump sum payment equal to the actuarial equivalent of the benefit that would have been paid had the participant terminated employment on the date of death and elected a joint and 50 percent survivor benefit. Survivor will receive 50% of the reported value.

(6) The LTIP provides that in the event of the death of a participant, the participant's beneficiary is entitled to any portion of a LTR award that had vested at the time of the participant's death but not been paid as well as any portion of a LTR award that would have vested at the end of the fiscal year during which the participant died or at the end of either of the two subsequent fiscal years, provided that the award for each such fiscal year will be prorated based on the number of whole months the participant was employed by TVA during the fiscal year during which he or she died.

(7) The LTIP provides that if a participant separates from service due to a disability, the participant is entitled to any portion of a LTR award that had vested at the time of the separation from service but not been paid as well as any portion of a LTR award that would have vested at the end of the fiscal year during which the participant separated from service or at the end of either of the two subsequent fiscal years, provided that the award for each such fiscal year will be prorated based on the number of whole months the participant was employed by TVA during the fiscal year during which he or she separated from service.

(8) The LTIP provides that in the event of the death of a participant, the participant's beneficiary is entitled to (1) any portion of a LTP award that had vested at the time of the participant's death but not been paid and (2) any LTP awards that had not vested at the time of the participant's death and that covered a performance cycle for which the participant had received a LTP grant, provided that the amount of any such LTP award (a) will be calculated assuming that the percent of opportunity achieved is 100 percent of target and (b) will be prorated based on the number of whole months the participant was participating in the plan during the applicable performance cycle.

(9) The LTIP provides that if a participant separates from service due to a disability, the participant is entitled to (1) any portion of a LTP award that had vested at the time of the participant's separation from service but not been paid and (2) any LTP awards that had not vested at the time of the participant's separation from service and that covered a performance cycle for which the participant had received a LTP grant, provided that the amount of any such LTP award (a) will be calculated assuming that the percent of opportunity achieved is 100 percent of target and (b) will be prorated based on the number of whole months the participant was employed by TVA during the applicable performance cycle.

(10) Amounts that Mr. Skaggs earned in past years but elected to defer, which are payable pursuant to elections he made and applicable IRS rules.

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Sherry A. Quirk	Retirement/Resignation	Termination without Cause	Termination with Cause	Death	Disability
Severance Agreement <sup>(1)</sup>	\$ —	\$ 477,405	\$ —	\$—	\$—
LTDCP	\$ —	\$ —	\$ —	\$—	\$—
SERP	\$ —	<sup>(2)</sup> \$ —	<sup>(2)</sup> \$ —	<sup>(2)</sup> \$ 138,629	<sup>(3)</sup> <sup>(4)</sup> \$ 138,629 <sup>(3)</sup>
LTRIP	\$ —	\$ 150,000	\$ —	\$ 150,000	\$ 150,000
LTR	\$ 125,000	\$ 125,000	\$ 125,000	\$ 220,833	<sup>(5)</sup> \$ 220,833 <sup>(6)</sup>
LTP	\$ —	\$ —	\$ —	\$ 598,333	<sup>(7)</sup> \$ 598,333 <sup>(8)</sup>
Deferred Compensation	\$ —	\$ —	\$ —	\$—	\$—
Total Value of Potential Payments	\$ 125,000	\$ 752,405	\$ 125,000	\$ 1,107,795	\$ 1,107,795

## Notes

(1) In December 2014, TVA entered into an arrangement with Ms. Quirk that provides a lump-sum payment equal to one year's annual salary in the event TVA terminates her employment without cause.

(2) The five-year vesting requirement has not been met.

(3) Represents the present value of the accumulated benefit.

(4) In the event of death while employed by TVA, the beneficiary would receive a lump sum payment equal to the actuarial equivalent of the benefit that would have been paid had the participant terminated employment on the date of death and elected a joint and 50 percent survivor benefit. Survivor will receive 50% of the reported value.

(5) The LTIP provides that in the event of the death of a participant, the participant's beneficiary is entitled to any portion of a LTR award that had vested at the time of the participant's death but not been paid as well as any portion of a LTR award that would have vested at the end of the fiscal year during which the participant died or at the end of either of the two subsequent fiscal years, provided that the award for each such fiscal year will be prorated based on the number of whole months the participant was employed by TVA during the fiscal year during which he or she died.

(6) The LTIP provides that if a participant separates from service due to a disability, the participant is entitled to any portion of a LTR award that had vested at the time of the separation from service but not been paid as well as any portion of a LTR award that would have vested at the end of the fiscal year during which the participant separated from service or at the end of either of the two subsequent fiscal years, provided that the award for each such fiscal year will be prorated based on the number of whole months the participant was employed by TVA during the fiscal year during which he or she separated from service.

(7) The LTIP provides that in the event of the death of a participant, the participant's beneficiary is entitled to (1) any portion of a LTP award that had vested at the time of the participant's death but not been paid and (2) any LTP awards that had not vested at the time of the participant's death and that covered a performance cycle for which the participant had received a LTP grant, provided that the amount of any such LTP award (a) will be calculated assuming that the percent of opportunity achieved is 100 percent of target and (b) will be prorated based on the number of whole months the participant was participating in the plan during the applicable performance cycle.

(8) The LTIP provides that if a participant separates from service due to a disability, the participant is entitled to (1) any portion of a LTP award that had vested at the time of the participant's separation from service but not been paid and (2) any LTP awards that had not vested at the time of the participant's separation from service and that covered a performance cycle for which the participant had received a LTP grant, provided that the amount of any such LTP award (a) will be calculated assuming that the percent of opportunity achieved is 100 percent of target and (b) will be prorated based on the number of whole months the participant was employed by TVA during the applicable performance cycle.

## Other Agreements

Except as described above and in the Compensation Discussion and Analysis, there are no other agreements between TVA and any of the Named Executive Officers.

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## Director Compensation

The TVA Act provides for up to nine directors on the TVA Board. Under the TVA Act, each director receives certain stipends that are increased annually by the same percentage increase applicable to adjustments under 5 U.S.C. § 5318, which adjusts the annual rates of pay of employees on the Executive Schedule of the United States Government. On January 1, 2017, the stipend for TVA directors was increased to \$51,005 per year unless (1) the director chairs a TVA Board committee, in which case the stipend was increased to \$52,015 per year, or (2) the director is the Chair of the TVA Board, in which case the stipend was increased to \$56,762 per year. Directors are also reimbursed under federal law for travel, lodging, and related expenses while attending meetings and for other official TVA business.

The annual stipends provided by the TVA Act for each director and for the Chair of the TVA Board as of November 14, 2017, are listed below:

## TVA Board Annual Stipends

Name	Annual Stipend (\$)
Marilyn A. Brown	52,015
V. Lynn Evans	52,015
Richard C. Howorth	56,762
Virginia T. Lodge	52,015
Eric M. Satz	52,015
Ronald A. Walter	52,015

The following table provides information on the compensation received by TVA's directors during 2017:  
Director Compensation

Name	Fees Earned or Paid in Cash (\$)	Stock Awards (\$)	Option Awards (\$)	Non-Equity Incentive Plan Compensation (\$)	Change in Pension Value and Nonqualified Deferred Compensation Earnings <sup>(1)</sup> (\$)	All Other Compensation <sup>(2)</sup> (\$)	Total (\$)
Marilyn A. Brown	51,906	—	—	—	—	519	52,425
V. Lynn Evans	53,549	—	—	—	—	2,596	56,145
Richard C. Howorth	53,841	—	—	—	—	2,672	56,513
Virginia T. Lodge	51,566	—	—	—	—	2,572	54,138
Eric M. Satz	51,566	—	—	—	—	2,572	54,138
Ronald A. Walter	51,566	—	—	—	—	515	52,081

## Note

(1) TVA directors do not participate in the TVA Retirement System, TVA's SERP, or any non-qualified deferred compensation plan available to TVA employees. However, as appointed officers of the United States government, the directors are members of FERS. FERS is administered by the federal Office of Personnel Management, and information regarding the value of FERS pension benefits is not available to TVA.

(2) These amounts include TVA's non-elective and matching contributions to the TSP.

The directors are not eligible to participate in any incentive programs available to TVA employees. The directors do not participate in the TVA Retirement System and do not participate in TVA's SERP. However, as appointed officers of the United States government, the directors are members of the Federal Employees Retirement System ("FERS"). FERS is a tiered retirement plan that includes three components: (1) Social Security benefits, (2) the Basic Benefit Plan, and (3) the Thrift Savings Plan ("TSP"). As members of FERS, each director is required to make a mandatory small percentage contribution of his or her stipend to the Basic Benefit Plan in the amount of 0.8 percent for those directors appointed prior to January 1, 2013, 3.1 percent for those directors appointed between January 1, 2013, and December 31, 2013, and 4.4 percent for those directors appointed on or after January 1, 2014.

The FERS Basic Benefit Plan is a qualified defined benefit plan that provides a retirement benefit based on a final average pay formula that includes age, highest average salary during any three consecutive years of service, and years of creditable service. A director must have at least five years of creditable service to be eligible to receive retirement benefits. Directors are eligible for immediate, unreduced retirement benefits once (1) they reach age 62 and have five years of FERS creditable service, (2) they reach age 60 and have 20 years of FERS creditable service, or (3) they attain the minimum retirement age and accumulate the specified years of service as set forth in the FERS regulations. Generally, benefits are calculated by multiplying 1.0 percent of the highest average salary during any three consecutive years of service by the number



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of years of creditable service. Directors who retire at age 62 or later with at least 20 years of FERS creditable service receive an enhanced benefit (a factor of 1.1 percent is used rather than 1.0 percent).

Directors may also retire with an immediate benefit under FERS if they reach their minimum retirement age based on type of retirement and years of service and have accumulated at least 10 years of FERS creditable service. For directors who reach the minimum retirement age and have at least 10 years of FERS creditable service, the annuity will be reduced by five percent for each year the director is under age 62.

Each director is also eligible to participate in the TSP. The TSP is a tax-deferred retirement savings and investment plan that offers the same type of savings and tax benefits offered under 401(k) plans. Once a director becomes eligible, TVA contributes an amount equal to one percent of the director's stipend into a TSP account for the director. These contributions are made automatically every two weeks regardless of whether the director makes a contribution of his or her own money. Directors are eligible to contribute up to the IRS elective deferral limit. Directors receive matching contributions of 100 percent of each dollar for the first three percent of the director's stipend and 50 percent of each dollar for the next two percent of the director's stipend.

TVA offers a group of health and other benefits (medical, dental, vision, life and accidental death and disability insurance, and long-term disability insurance) that are available to a broad group of employees. Directors are eligible to participate in TVA's health benefit plans and other non-retirement benefit plans on the same terms and at the same contribution rates as other TVA employees.

Compensation Committee Interlocks and Insider Participation

The People and Performance Committee of the TVA Board currently consists of the following three directors: Richard C. Howorth, Virginia T. Lodge and Ronald A. Walter.

No executive officer of TVA serves on the board of an entity that has an executive officer serving as a director of TVA.

Compensation Committee Report

The People and Performance Committee has reviewed and discussed the Compensation Discussion and Analysis with management, and based on the review and discussions, the Committee recommended to the TVA Board that the Compensation Discussion and Analysis be included in this Annual Report.

PEOPLE AND PERFORMANCE COMMITTEE

Richard C. Howorth, Chair  
Virginia T. Lodge  
Ronald A. Walter

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ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Not applicable.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

Director Independence

The composition of the TVA Board is governed by the TVA Act. The TVA Act contains certain provisions that are similar to the considerations for independence under section 10A(m)(3) of the Exchange Act, including that to be eligible for appointment to the TVA Board, an individual shall not be an employee of TVA and shall make full disclosure to Congress of any investment or other financial interest that the individual holds in the energy industry.

Related Party Transactions

Conflict of Interest Provisions

All TVA employees, including directors and executive officers, are subject to the conflict of interest laws and regulations applicable to employees of the federal government. Accordingly, the general federal conflict of interest statute (18 U.S.C. § 208) and the Standards of Ethical Conduct for Employees of Executive Branch (5 C.F.R. part 2635) ("Standards of Ethical Conduct") form the basis of TVA's policies and procedures for the review, approval, or ratification of related party transactions. The general federal conflict of interest statute, subject to certain exceptions, prohibits each government employee, including TVA's directors and executive officers, from participating personally and substantially (by advice, decision, or otherwise) as a government employee in any contract, controversy, proceeding, request for determination, or other particular matter in which, to his or her knowledge, he or she (or his or her spouse, minor child, general partner, organization with which he or she serves as officer, director, employee, trustee, or general partner, or any person or organization with which he or she is negotiating, or has an arrangement, for future employment) has a financial interest. Exceptions to the statutory prohibition relevant to TVA employees are (1) financial interests which have been deemed by the Office of Government Ethics, in published regulations, to be too remote or inconsequential to affect the integrity of the employee's services, or (2) interests which are determined in writing, after full disclosure and on a case-by-case basis, to be not so substantial as to be deemed likely to affect the integrity of the employee's services for TVA. In accordance with the statute, individual waiver determinations are made by the official responsible for the employee's appointment. In the case of TVA directors, the determination may be made by the Chair of the TVA Board, and in the case of the Chair of the TVA Board, the determination may be made by the Counsel to the President of the United States.

More broadly, Subpart E of the Standards of Ethical Conduct provides that where an employee (1) knows that a particular matter involving specific parties is likely to have a direct and predictable effect on the financial interests of a member of his or her household, or that a person with whom the employee has a "covered relationship" (which includes, but is not limited to, persons with whom the employee has a close family relationship and organizations in which the employee is an active participant) is or represents a party to the matter, and (2) determines that the circumstances would cause a reasonable person with knowledge of relevant facts to question his or her impartiality in the matter, the employee should not participate in the matter absent agency authorization. This authorization may be given by the employee's supervising officer, as agency designee, in consultation with the TVA Designated Agency Ethics Official, upon the determination that TVA's interest in the employee's participation in the matter outweighs the concern that a reasonable person may question the integrity of TVA's programs and operations.

The previously described restrictions are reflected in TVA's Standard Programs and Processes 11.8.1, Business Ethics, which requires employees, including TVA's directors and executive officers, to comply with the guidelines outlined in the Standards of Ethical Conduct and which restates the standard of the conflict of interest statute.

Additionally, the TVA Board approved a written conflict of interest policy that applies to all TVA employees, including TVA's directors and executive officers. The conflict of interest policy reaffirms the requirement that all TVA employees must comply with applicable federal conflict of interest laws, regulations, and policies. It also establishes an additional policy that is applicable to TVA's directors and CEO. This additional policy provides that TVA's directors and CEO shall not hold a financial interest in (1) any distributor of TVA power, (2) any entity engaged primarily in the wholesale or retail generation, transmission, or sale of electricity, except where substantially all such business is conducted outside of North America, or (3) any entity that may reasonably be perceived as likely to be adversely affected by the success of TVA as a producer or transmitter of electric power. Any waiver of this additional policy may be made only by the Board and will be disclosed promptly to the public, subject to the limitations on disclosure imposed by law.

TVA also has a protocol titled the "Obtaining Things of Value from TVA Protocol" (the "Protocol"). The Protocol describes what a TVA employee should do if a person covered by the Protocol asks for assistance in obtaining a specified thing of value from TVA. Similarly, the TVA Board Practice on External Inquiries describes what a member of the TVA Board should do if a person covered by the practice asks for assistance in obtaining a specified thing of value from TVA.

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TVA relies on the policies, practices, laws, and regulations discussed above to regulate conflicts of interest involving employees, including directors and executive officers. TVA has no other written or unwritten policy for the approval or ratification of any transactions in which TVA was or is to be a participant and in which any director or executive officer of TVA (or any child, stepchild, parent, stepparent, spouse, sibling, mother-in-law, father-in-law, son-in-law, daughter-in-law, brother-in-law, or sister-in-law of any director or executive officer of TVA) had or will have a direct or indirect material interest.

## Other Relationships

TVA is engaged in a number of transactions with other agencies of the U.S. government, although such agencies do not fall within the definition of “related parties” for purposes of Item 404(a) of Regulation S-K. These include, among other things, supplying electricity to other federal agencies, purchasing electricity from the Southeastern Power Administration, and engaging in various arrangements involving nuclear materials with the DOE. See Item 1, Business and Note 22.

TVA also has access to a financing arrangement with the United States Department of the Treasury (“U.S. Treasury”). TVA and the U.S. Treasury have a memorandum of understanding under which the U.S. Treasury provides TVA with a \$150 million credit facility. There were no outstanding borrowings under the facility at September 30, 2017. This credit facility matures on September 30, 2018, and is expected to be renewed. This arrangement is pursuant to the TVA Act. Access to this credit facility or other similar financing arrangements with the U.S. Treasury has been available to TVA since the 1960s. See Note 13 — Credit Facility Agreements.

In addition, TVA is required by the 1959 amendment to the TVA Act to make annual payments to the U.S. Treasury from net power proceeds as a repayment of and as a return on the Power Program Appropriation Investment until \$1.0 billion of the Power Program Appropriation Investment has been repaid. With the 2014 payment, TVA fulfilled its requirement to repay \$1.0 billion of the Power Program Appropriation Investment. The TVA Act requires TVA to continue to make payments to the U.S. Treasury indefinitely as a return on the remaining \$258 million of the Power Program Appropriation Investment. See Note 17 — Appropriation Investment.

## ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The following table shows the fees of Ernst & Young LLP for audit, audit-related, and other services for the years ended September 30, 2017 and 2016.

Principal Accountant Fees and Services  
(in actual dollars)

Year	Principal Accountant	Audit Fees <sup>(1)</sup>	Audit-Related Fees	All Other Fees	Total
2017	Ernst & Young LLP	\$2,688,826	\$	—	\$2,688,826
2016	Ernst & Young LLP	2,700,896	—	—	2,700,896

## Note

(1) Audit fees consist of payments for professional services rendered in connection with the audit of TVA's annual financial statements, including the annual attestation on internal control over financial reporting and the review of interim financial statements included in TVA's quarterly reports; audit of TVA's fuel cost adjustment; audit of TVA's federal closing package for the preparation and audit of the 2016 and 2017 federal consolidated financial statements of which TVA is a component; Bond offering and other financing comfort letters; and accounting consultations related to TVA's adoption of the new revenue recognition standard.

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The TVA Board has an Audit, Risk, and Regulation Committee. Under the TVA Act, the Audit, Risk, and Regulation Committee, in consultation with the Inspector General, recommends to the TVA Board the selection of an external auditor. TVA's Audit, Risk, and Regulation Committee, in consultation with the Inspector General, recommended that the TVA Board select Ernst & Young LLP as TVA's external auditor for the 2016 and 2017 audits and other related services, and the TVA Board approved these recommendations.

TVA has a policy (the "Policy") that requires all auditing services and permissible non-audit services provided by the external auditor to be pre-approved by the Audit, Risk, and Regulation Committee. The Policy also lists the following services as ones the external auditor is not permitted to perform:

- Bookkeeping or other services related to the accounting records or financial statements of TVA;
- Financial information system design and implementation;
- Appraisal or valuation services, fairness opinions, and contribution-in-kind reports;
- Actuarial services;
- Internal audit outsourcing services;
- Management functions or human resources;
- Broker or dealer, investment adviser, or investment banking services;
- Legal services and expert services unrelated to the audit; and
- Any other services that the Public Company Accounting Oversight Board determines, by regulation, are impermissible.

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The Policy also delegates to the Chair of the Audit, Risk, and Regulation Committee the authority to pre-approve a permissible service so long as the amount of the service does not exceed \$100,000 and the total amount of services pre-approved during the year by the Chair does not exceed \$200,000. The Chair must report for informational purposes the services pre-approved under this provision at the Audit, Risk, and Regulation Committee's next meeting.

The Audit, Risk, and Regulation Committee pre-approved all audit services for 2016 and 2017.

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PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(a) The following documents have been filed as part of this Annual Report:

(1) Consolidated Financial Statements. The following documents are provided in Item 8, Financial Statements and Supplementary Data herein:

Consolidated Statements of Operations  
Consolidated Statements of Comprehensive Income (Loss)  
Consolidated Balance Sheets  
Consolidated Statements of Cash Flows  
Consolidated Statements of Changes in Proprietary Capital  
Notes to Consolidated Financial Statements  
Report of Independent Registered Public Accounting Firm (Ernst and Young LLP)

(2) Consolidated Financial Statement Schedules.

Schedules not included are omitted because they are not required or because the required information is provided in the consolidated financial statements, including the notes thereto.

(3) List of Exhibits

Exhibit No. Description

3.1 Tennessee Valley Authority Act of 1933, as amended, 16 U.S.C. §§ 831-831ee (Incorporated by reference to Exhibit 3.1 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2016, File No. 000-52313)

3.2 Bylaws of the Tennessee Valley Authority Adopted by the TVA Board of Directors on May 18, 2006, as amended on April 3, 2008, May 19, 2008, June 10, 2010, February 13, 2014, August 21, 2014, and November 6, 2014 (Incorporated by reference to Exhibit 3.2 to TVA's Annual Report on Form 10-K for the year ended September 30, 2014, File No. 000-52313)

4.1 Basic Tennessee Valley Authority Power Bond Resolution Adopted by the TVA Board of Directors on October 6, 1960, as Amended on September 28, 1976, October 17, 1989, and March 25, 1992 (Incorporated by reference to Exhibit 4.1 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)

10.1 \$1,000,000,000 Spring Maturity Credit Agreement Dated as of June 25, 2012, Among TVA, The Bank of New York Mellon as Administrative Agent, Letter of Credit Issuer, and a Lender, Bank of America, N.A., Canadian Imperial Bank of Commerce, New York Agency, First Tennessee Bank National Association, Morgan Stanley Bank, N.A., and Toronto Dominion (New York) LLC (Incorporated by reference to Exhibit 10.1 to TVA's Current Report on Form 8-K filed on June 28, 2012, File No. 000-52313)

10.2 Amendment Dated as of December 12, 2012, to \$1,000,000,000 Spring Maturity Credit Agreement Dated as of June 25, 2012, Among TVA, The Bank of New York Mellon as Administrative Agent, Letter of Credit Issuer, and a Lender, Bank of America, N.A., Canadian Imperial Bank of Commerce, New York Agency, First Tennessee Bank National Association, Morgan Stanley Bank, N.A., and Toronto

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Dominion (New York) LLC (Incorporated by reference to Exhibit 10.2 to TVA's Current Report on Form 8-K filed on December 17, 2012, File No. 000-52313)

10.3 Second Amendment Dated as of June 2, 2015, to \$1,000,000,000 Spring Maturity Credit Agreement Dated as of June 25, 2012, and amended as of December 12, 2012, Among TVA, The Bank of New York Mellon as Administrative Agent, Letter of Credit Issuer, and a Lender, Bank of America, N.A., Canadian Imperial Bank of Commerce, New York Agency, First Tennessee Bank National Association, Morgan Stanley Bank, N.A., and Toronto Dominion (New York) LLC (Incorporated by reference to Exhibit 10.1 to TVA's Current Report on Form 8-K filed on June 5, 2015, File No. 000-52313)

10.4 \$1,000,000,000 September 2020 Maturity Credit Agreement Dated as of September 30, 2015, Among TVA, Royal Bank of Canada, as Administrative Agent, Letter of Credit Issuer, and a Lender, Barclays Bank PLC, BNP Paribas, Branch Banking and Trust Company, Mizuho Bank Ltd, Regions Bank, SunTrust Bank, and Wells Fargo Bank, National Association (Incorporated by reference to Exhibit 10.1 to TVA's Current Report on Form 8-K filed on October 5, 2015, File No. 000-52313)

10.5 \$500,000,000 February 2020 Maturity Credit Agreement Dated as of August 7, 2015, Among TVA, Bank of America, N.A., as Administrative Agent, Letter of Credit Issuer, and a Lender, and the Other Lenders Party Thereto (Incorporated by reference to Exhibit 10.1 to TVA's Current Report on Form 8-K filed on August 7, 2015, File No. 000-52313)

10.6 First Amendment Dated as of February 28, 2017, to the \$500,000,000 February 2020 Maturity Credit Agreement Dated as of August 7, 2015, Among TVA, Bank of America, N.A., as Administrative Agent, Letter of Credit Issuer, and a Lender, and the Other Lenders Party Thereto (Incorporated by Reference to Exhibit 10.1 to TVA's Current Report on Form 8-K filed on March 3, 2017, File No. 000-52313)

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- 10.7 December 2019 Maturity Community Bank Credit Agreement Dated as of December 12, 2016, with SunTrust Bank as Administrative Agent and a Lender, Branch Banking and Trust Company as Letter of Credit Issuer and a Lender, First National Bank, First Tennessee Bank National Association, HomeTrust Bank, Pinnacle Bank, Regions Bank, Trustmark National Bank, and United Community Bank (Incorporated by Reference to Exhibit 10.1 to TVA's Current Report on Form 8-K filed on December 15, 2016, File No. 000-52313)
- 10.8 TVA Discount Notes Selling Group Agreement (Incorporated by reference to Exhibit 10.2 to TVA's Quarterly Report on Form 10-Q for the quarter ended June 30, 2008, File No. 000-52313)
- 10.9 Electronotes® Selling Agent Agreement Dated as of June 1, 2006, Among TVA, LaSalle Financial Services, Inc., A.G. Edwards & Sons, Inc., Citigroup Global Markets Inc., Edward D. Jones & Co., L.P., First Tennessee Bank National Association, J.J.B. Hilliard, W.L. Lyons, Inc., Merrill Lynch, Pierce, Fenner & Smith Incorporated, Morgan Stanley & Co. Incorporated, and Wachovia Securities, LLC (Incorporated by reference to Exhibit 10.4 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- 10.10 Amendment Dated as of December 4, 2013, to Electronotes® Selling Agent Agreement Dated as of June 1, 2006, Among TVA, LaSalle Financial Services, Inc., A.G. Edwards & Sons, Inc., Citigroup Global Markets Inc., Edward D. Jones & Co., L.P., First Tennessee Bank National Association, J.J.B. Hilliard, W.L. Lyons, Inc., Merrill Lynch, Pierce, Fenner & Smith Incorporated, Morgan Stanley & Co. Incorporated, and Wachovia Securities, LLC (Incorporated by reference to Exhibit 10.3 to TVA's Quarterly Report on Form 10-Q for the quarter ended March 31, 2014, File No. 000-52313)
- 10.11 Second Amendment Dated as of August 28, 2015, to Electronotes® Selling Agent Agreement Dated as of June 1, 2006, and Amended as of December 4, 2013, Among TVA, LaSalle Financial Services, Inc., A.G. Edwards & Sons, Inc., Citigroup Global Markets Inc., Edward D. Jones & Co., L.P., First Tennessee Bank National Association, J.J.B. Hilliard, W.L. Lyons, Inc., Merrill Lynch, Pierce, Fenner & Smith Incorporated, Morgan Stanley & Co. Incorporated, and Wachovia Securities, LLC (Incorporated by reference to Exhibit 10.9 to TVA's Annual Report on Form 10-K for the year ended September 30, 2015, File No. 000-52313)
- 10.12 Assumption Agreement Between TVA and Incapital LLC Dated as of February 29, 2008, Relating to the Electronotes® Selling Agent Agreement Dated as of June 1, 2006, Among TVA, LaSalle Financial Services, Inc., A.G. Edwards & Sons, Inc., Citigroup Global Markets Inc., Edward D. Jones & Co., L.P., First Tennessee Bank National Association, J.J.B. Hilliard, W.L. Lyons, Inc., Merrill Lynch, Pierce, Fenner & Smith Incorporated, Morgan Stanley & Co. Incorporated, and Wachovia Securities, LLC (Incorporated by reference to Exhibit 10.1 to TVA's Quarterly Report on Form 10-Q for the quarter ended March 31, 2008, File No. 000-52313)
- 10.13 Commitment Agreement Among Memphis Light, Gas and Water Division, the City of Memphis, Tennessee, and TVA Dated as of November 19, 2003 (Incorporated by reference to Exhibit 10.5 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- 10.14 Power Contract Supplement No. 95 Among Memphis Light, Gas and Water Division, the City of Memphis, Tennessee, and TVA Dated as of November 19, 2003 (Incorporated by reference to Exhibit 10.6 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- 10.15 Void Walk Away Agreement Among Memphis Light, Gas and Water Division, the City of Memphis, Tennessee, and TVA Dated as of November 20, 2003 (Incorporated by reference to Exhibit 10.7 to TVA's

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Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)

10.16 Power Contract Supplement No. 96 Among Memphis Light, Gas and Water Division, the City of Memphis, Tennessee, and TVA Dated as of November 20, 2003 (Incorporated by reference to Exhibit 10.8 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)

10.17 Overview of TVA's September 26, 2003, Lease and Leaseback of Control, Monitoring, and Data Analysis Network with Respect to TVA's Transmission System in Tennessee, Kentucky, Georgia, and Mississippi (Incorporated by reference to Exhibit 10.9 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)

10.18 Participation Agreement Dated as of September 22, 2003, Among (1) TVA, (2) NVG Network I Statutory Trust, (3) Wells Fargo Delaware Trust Company, Not in Its Individual Capacity, Except to the Extent Expressly Provided in the Participation Agreement, But as Owner Trustee, (4) Wachovia Mortgage Corporation, (5) Wilmington Trust Company, Not in Its Individual Capacity, Except to the Extent Expressly Provided in the Participation Agreement, But as Lease Indenture Trustee, and (6) Wilmington Trust Company, Not in Its Individual Capacity, Except to the Extent Expressly Provided in the Participation Agreement, But as Pass Through Trustee (Incorporated by reference to Exhibit 10.10 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)

10.19\* Network Lease Agreement Dated as of September 26, 2003, Between NVG Network I Statutory Trust, as Owner Lessor, and TVA, as Lessee (Incorporated by reference to Exhibit 10.11 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)

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- Head Lease Agreement Dated as of September 26, 2003, Between TVA, as Head Lessor, and NVG Network I  
10.20\* Statutory Trust, as Head Lessee (Incorporated by reference to Exhibit 10.12 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- Leasehold Security Agreement Dated as of September 26, 2003, Made by NVG Network I Statutory Trust to  
10.21\* TVA (Incorporated by reference to Exhibit 10.13 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- Facility Lease-Purchase Agreement Dated as of January 17, 2012, Between John Sevier Combined Cycle  
10.22 Generation LLC and TVA (Incorporated by reference to Exhibit 10.1 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2011, File No. 000-52313)
- Head Lease Agreement Dated as of January 17, 2012, Among the United States of America, TVA, and John  
10.23 Sevier Combined Cycle Generation LLC (Incorporated by reference to Exhibit 10.2 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2011, File No. 000-52313)
- Asset Purchase Agreement Dated as of August 6, 2013, Between TVA and Seven States Southaven, LLC  
10.24\* (Incorporated by reference to Exhibit 10.33 to TVA's Annual Report on Form 10-K for the year ended September 30, 2013, File No. 000-52313)
- Facility Lease-Purchase Agreement Dated as of August 9, 2013, Between Southaven Combined Cycle  
10.25 Generation LLC and TVA (Incorporated by reference to Exhibit 10.34 to TVA's Annual Report on Form 10-K for the year ended September 30, 2013, File No. 000-52313)
- Head Lease Agreement Dated as of August 9, 2013, Among the United States of America, TVA, and  
10.26 Southaven Combined Cycle Generation LLC (Incorporated by reference to Exhibit 10.35 to TVA's Annual Report on Form 10-K for the year ended September 30, 2013, File No. 000-52313)
- Federal Facilities Compliance Agreement Between the United States Environmental Protection Agency and  
10.27\* TVA (Incorporated by reference to Exhibit 10.2 to TVA's Quarterly Report on Form 10-Q for the quarter ended June 30, 2011, File No. 000-52313)
- Consent Decree Among Alabama, Kentucky, North Carolina, Tennessee, the Alabama Department of  
10.28\* Environmental Management, the National Parks Conservation Association, Inc., the Sierra Club, Our Children's Earth Foundation, and TVA (Incorporated by reference to Exhibit 10.3 to TVA's Quarterly Report on Form 10-Q for the quarter ended June 30, 2011, File No. 000-52313)
- TVA Compensation Plan Approved by the TVA Board on May 31, 2007, as Amended on August 25, 2016  
10.29† (Incorporated by Reference to Exhibit 10.28 to TVA's Annual Report on Form 10-K for the year ended September 30, 2016, File No. 000-52313)
- Amended and Restated Supplemental Executive Retirement Plan Effective as of May 1, 2015 (Incorporated by  
10.30† reference to Exhibit 10.1 to TVA's Quarterly Report on Form 10-Q for the quarter ended June 30, 2015, File No. 000-52313)
- Amended and Restated Executive Annual Incentive Plan Effective as of October 1, 2015 (Incorporated by  
10.31† reference to Exhibit 10.1 to TVA's Current Report on Form 8-K filed on October 1, 2015, File No. 000-52313)
- 10.32†

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Executive Long-Term Incentive Plan (Incorporated by reference to Exhibit 10.4 to TVA's Current Report on Form 8-K filed on January 6, 2009, File No. 000-52313)

10.33† Long-Term Deferred Compensation Plan (Incorporated by reference to Exhibit 10.5 to TVA's Current Report on Form 8-K filed on January 6, 2009, File No. 000-52313)

10.34† Deferred Compensation Plan (Incorporated by reference to Exhibit 10.2 to TVA's Current Report on Form 8-K filed on January 6, 2009, File No. 000-52313)

10.35† Long-Term Retention Incentive Plan (Incorporated by reference to Exhibit 10.1 to TVA's Quarterly Report on Form 10-Q for the quarter ended March 31, 2014, File No. 000-52313)

10.36† Long-Term Incentive Plan Effective as of October 1, 2015 (Incorporated by reference to Exhibit 10.3 to TVA's Current Report on Form 8-K filed on October 1, 2015, File No. 000-52313)

10.37† Retention Incentive Plan Effective as of October 1, 2015 (Incorporated by reference to Exhibit 10.2 to TVA's Current Report on Form 8-K filed on October 1, 2015, File No. 000-52313)

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- 10.38† Offer Letter to William D. Johnson Approved as of November 1, 2012 (Incorporated by reference to Exhibit 99.1 to TVA's Current Report on Form 8-K filed on November 7, 2012, File No. 000-52313)
- 10.39† Offer Letter to Joseph P. Grimes, Jr., Accepted as of June 18, 2013 (Incorporated by reference to Exhibit 10.37 to TVA's Annual Report on Form 10-K for the year ended September 30, 2014, File No. 000-52313)
- 10.40 Offer Letter to Sherry A. Quirk Accepted as of December 29, 2014
- 10.41 Deferral Agreement Between TVA and William D. Johnson Dated as of January 1, 2013 (Incorporated by reference to Exhibit 10.38 to TVA's Annual Report on Form 10-K for the year ended September 30, 2014, File No. 000-52313)
- 10.42 Deferral Agreement Between TVA and John M. Thomas, III, Dated as of September 27, 2010 (Incorporated by reference to Exhibit 10.40 to TVA's Annual Report on Form 10-K for the year ended September 30, 2010, File No. 000-52313)
- 10.43 Deferral Agreement Between TVA and John M. Thomas, III, Dated as of January 4, 2012 (Incorporated by reference to Exhibit 10.45 to TVA's Annual Report on Form 10-K for the year ended September 30, 2012, File No. 000-52313)
- 10.44 Deferral Agreement Between TVA and John M. Thomas, III, Dated as of April 22, 2013 (Incorporated by reference to Exhibit 10.4 to TVA's Quarterly Report on Form 10-Q for the quarter ended June 30, 2013, File No. 000-52313)
- 10.45 Deferral Agreement Between TVA and John M. Thomas, III, Dated as of February 27, 2014 (Incorporated by reference to Exhibit 10.43 to TVA's Annual Report on Form 10-K for the year ended September 30, 2014, File No. 000-52313)
- 10.46 Deferral Agreement Between TVA and Joseph P. Grimes, Jr., Dated as of September 5, 2013 (Incorporated by reference to Exhibit 10.45 to TVA's Annual Report on Form 10-K for the year ended September 30, 2014, File No. 000-52313)
- 10.47 Deferral Agreement Between TVA and Michael D. Skaggs Dated as of March 1, 2010 (Incorporated by reference to Exhibit 10.61 to TVA's Annual Report on Form 10-K for the year ended September 30, 2013, File No. 000-52313)
- 10.48 Deferral Agreement Between TVA and Michael D. Skaggs Dated as of March 20, 2013 (Incorporated by reference to Exhibit 10.62 to TVA's Annual Report on Form 10-K for the year ended September 30, 2013, File No. 000-52313)
- 10.49† Long-Term Retention Incentive Plan Award Notice for William D. Johnson for Award Granted as of November 10, 2014 (Incorporated by reference to Exhibit 10.1 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2014, File No. 000-52313)
- 10.50† Long-Term Retention Incentive Plan Award Notice for John M. Thomas, III, for First Award Granted as of January 1, 2015 (Incorporated by reference to Exhibit 10.2 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2014, File No. 000-52313)
- 10.51†

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Long-Term Retention Incentive Plan Award Notice for John M. Thomas, III, for Second Award Granted as of January 1, 2015 (Incorporated by reference to Exhibit 10.3 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2014, File No. 000-52313)

Long-Term Retention Incentive Plan Award Notice for Joseph P. Grimes, Jr., for Award Granted as of June 1, 2014 (Incorporated by reference to Exhibit 10.56 to TVA's Annual Report on Form 10-K for the year ended September 30, 2015, File No. 000-52313)

Long-Term Retention Incentive Plan Award Notice for Joseph P. Grimes, Jr., for Award Granted as of January 1, 2015 (Incorporated by reference to Exhibit 10.5 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2014, File No. 000-52313)

Long-Term Retention Incentive Plan Award Notice for Michael D. Skaggs for Award Granted as of January 1, 2015 (Incorporated by reference to Exhibit 10.6 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2014, File No. 000-52313)

Retention Incentive Arrangement Between TVA and John M. Thomas, III, Dated as of January 1, 2015 (Incorporated by reference to Exhibit 10.7 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2014, File No. 000-52313)

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14.1	Disclosure and Financial Ethics Code (Incorporated by reference to Exhibit 14 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
14.2	TVA Conflict of Interest Policy, as amended (Incorporated by reference to Exhibit 14.2 to TVA's Annual Report on Form 10-K for the year ended September 30, 2014, File No. 000-52313)
31.1	Rule 13a-14(a)/15d-14(a) Certification Executed by the Chief Executive Officer
31.2	Rule 13a-14(a)/15d-14(a) Certification Executed by the Chief Financial Officer
32.1	Section 1350 Certification Executed by the Chief Executive Officer
32.2	Section 1350 Certification Executed by the Chief Financial Officer
101.INS	TVA XBRL Instance Document
101.SCH	TVA XBRL Taxonomy Extension Schema
101.CAL	TVA XBRL Taxonomy Extension Calculation Linkbase
101.DEF	TVA XBRL Taxonomy Extension Definition Linkbase
101.LAB	TVA XBRL Taxonomy Extension Label Linkbase
101.PRE	TVA XBRL Taxonomy Extension Presentation Linkbase

† Management contract or compensatory arrangement.

\* Certain schedule(s) and/or exhibit(s) have been omitted. TVA hereby undertakes to furnish supplementally copies of any of the omitted schedules and/or exhibits upon request by the Securities and Exchange Commission.





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Signature	Title	Date
/s/ William D. Johnson William D. Johnson	President and Chief Executive Officer (Principal Executive Officer)	November 14, 2017
/s/ John M. Thomas, III John M. Thomas, III	Executive Vice President and Chief Financial Officer (Principal Financial Officer)	November 14, 2017
/s/ Diane Wear Diane Wear	Vice President and Controller (Principal Accounting Officer)	November 14, 2017
/s/ Marilyn A. Brown Marilyn A. Brown	Director	November 14, 2017
/s/ V. Lynn Evans V. Lynn Evans	Director	November 14, 2017
/s/ Richard C. Howorth Richard C. Howorth	Director	November 14, 2017
/s/ Virginia T. Lodge Virginia T. Lodge	Director	November 14, 2017
/s/ Eric M. Satz Eric M. Satz	Director	November 14, 2017
/s/ Ronald A. Walter Ronald A. Walter	Director	November 14, 2017



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EXHIBIT INDEX

Exhibit No. Description

- 3.1 Tennessee Valley Authority Act of 1933, as amended, 16 U.S.C. §§ 831-831ee (Incorporated by reference to Exhibit 3.1 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2016, File No. 000-52313)
- 3.2 Bylaws of the Tennessee Valley Authority Adopted by the TVA Board of Directors on May 18, 2006, as amended on April 3, 2008, May 19, 2008, June 10, 2010, February 13, 2014, August 21, 2014, and November 6, 2014 (Incorporated by reference to Exhibit 3.2 to TVA's Annual Report on Form 10-K for the year ended September 30, 2014, File No. 000-52313)
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- 10.3 Second Amendment Dated as of June 2, 2015, to \$1,000,000,000 Spring Maturity Credit Agreement Dated as of June 25, 2012, and amended as of December 12, 2012, Among TVA, The Bank of New York Mellon as Administrative Agent, Letter of Credit Issuer, and a Lender, Bank of America, N.A., Canadian Imperial Bank of Commerce, New York Agency, First Tennessee Bank National Association, Morgan Stanley Bank, N.A., and Toronto Dominion (New York) LLC (Incorporated by reference to Exhibit 10.1 to TVA's Current Report on Form 8-K filed on June 5, 2015, File No. 000-52313)
- 10.4 \$1,000,000,000 September 2020 Maturity Credit Agreement Dated as of September 30, 2015, Among TVA, Royal Bank of Canada, as Administrative Agent, Letter of Credit Issuer, and a Lender, Barclays Bank PLC, BNP Paribas, Branch Banking and Trust Company, Mizuho Bank Ltd, Regions Bank, SunTrust Bank, and Wells Fargo Bank, National Association (Incorporated by reference to Exhibit 10.1 to TVA's Current Report on Form 8-K filed on October 5, 2015, File No. 000-52313)
- 10.5 \$500,000,000 February 2020 Maturity Credit Agreement Dated as of August 7, 2015, Among TVA, Bank of America, N.A., as Administrative Agent, Letter of Credit Issuer, and a Lender, and the Other Lenders Party Thereto (Incorporated by reference to Exhibit 10.1 to TVA's Current Report on Form 8-K filed on August 7, 2015, File No. 000-52313)
- 10.6

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First Amendment Dated as of February 28, 2017, to the \$500,000,000 February 2020 Maturity Credit Agreement Dated as of August 7, 2015, Among TVA, Bank of America, N.A., as Administrative Agent, Letter of Credit Issuer, and a Lender, and the Other Lenders Party Thereto (Incorporated by Reference to Exhibit 10.1 to TVA's Current Report on Form 8-K filed on March 3, 2017, File No. 000-52313)

10.7 December 2019 Maturity Community Bank Credit Agreement Dated as of December 12, 2016, with SunTrust Bank as Administrative Agent and a Lender, Branch Banking and Trust Company as Letter of Credit Issuer and a Lender, First National Bank, First Tennessee Bank National Association, HomeTrust Bank, Pinnacle Bank, Regions Bank, Trustmark National Bank, and United Community Bank (Incorporated by Reference to Exhibit 10.1 to TVA's Current Report on Form 8-K filed on December 15, 2016, File No. 000-52313)

10.8 TVA Discount Notes Selling Group Agreement (Incorporated by reference to Exhibit 10.2 to TVA's Quarterly Report on Form 10-Q for the quarter ended June 30, 2008, File No. 000-52313)

10.9 Electronotes® Selling Agent Agreement Dated as of June 1, 2006, Among TVA, LaSalle Financial Services, Inc., A.G. Edwards & Sons, Inc., Citigroup Global Markets Inc., Edward D. Jones & Co., L.P., First Tennessee Bank National Association, J.J.B. Hilliard, W.L. Lyons, Inc., Merrill Lynch, Pierce, Fenner & Smith Incorporated, Morgan Stanley & Co. Incorporated, and Wachovia Securities, LLC (Incorporated by reference to Exhibit 10.4 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)

10.10 Amendment Dated as of December 4, 2013, to Electronotes® Selling Agent Agreement Dated as of June 1, 2006, Among TVA, LaSalle Financial Services, Inc., A.G. Edwards & Sons, Inc., Citigroup Global Markets Inc., Edward D. Jones & Co., L.P., First Tennessee Bank National Association, J.J.B. Hilliard, W.L. Lyons, Inc., Merrill Lynch, Pierce, Fenner & Smith Incorporated, Morgan Stanley & Co. Incorporated, and Wachovia Securities, LLC (Incorporated by reference to Exhibit 10.3 to TVA's Quarterly Report on Form 10-Q for the quarter ended March 31, 2014, File No. 000-52313)

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- 10.11 Second Amendment Dated as of August 28, 2015, to Electronotes® Selling Agent Agreement Dated as of June 1, 2006, and Amended as of December 4, 2013, Among TVA, LaSalle Financial Services, Inc., A.G. Edwards & Sons, Inc., Citigroup Global Markets Inc., Edward D. Jones & Co., L.P., First Tennessee Bank National Association, J.J.B. Hilliard, W.L. Lyons, Inc., Merrill Lynch, Pierce, Fenner & Smith Incorporated, Morgan Stanley & Co. Incorporated, and Wachovia Securities, LLC (Incorporated by reference to Exhibit 10.9 to TVA's Annual Report on Form 10-K for the year ended September 30, 2015, File No. 000-52313)
- 10.12 Assumption Agreement Between TVA and Incapital LLC Dated as of February 29, 2008, Relating to the Electronotes® Selling Agent Agreement Dated as of June 1, 2006, Among TVA, LaSalle Financial Services, Inc., A.G. Edwards & Sons, Inc., Citigroup Global Markets Inc., Edward D. Jones & Co., L.P., First Tennessee Bank National Association, J.J.B. Hilliard, W.L. Lyons, Inc., Merrill Lynch, Pierce, Fenner & Smith Incorporated, Morgan Stanley & Co. Incorporated, and Wachovia Securities, LLC (Incorporated by reference to Exhibit 10.1 to TVA's Quarterly Report on Form 10-Q for the quarter ended March 31, 2008, File No. 000-52313)
- 10.13 Commitment Agreement Among Memphis Light, Gas and Water Division, the City of Memphis, Tennessee, and TVA Dated as of November 19, 2003 (Incorporated by reference to Exhibit 10.5 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- 10.14 Power Contract Supplement No. 95 Among Memphis Light, Gas and Water Division, the City of Memphis, Tennessee, and TVA Dated as of November 19, 2003 (Incorporated by reference to Exhibit 10.6 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- 10.15 Void Walk Away Agreement Among Memphis Light, Gas and Water Division, the City of Memphis, Tennessee, and TVA Dated as of November 20, 2003 (Incorporated by reference to Exhibit 10.7 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- 10.16 Power Contract Supplement No. 96 Among Memphis Light, Gas and Water Division, the City of Memphis, Tennessee, and TVA Dated as of November 20, 2003 (Incorporated by reference to Exhibit 10.8 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- 10.17 Overview of TVA's September 26, 2003, Lease and Leaseback of Control, Monitoring, and Data Analysis Network with Respect to TVA's Transmission System in Tennessee, Kentucky, Georgia, and Mississippi (Incorporated by reference to Exhibit 10.9 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- 10.18 Participation Agreement Dated as of September 22, 2003, Among (1) TVA, (2) NVG Network I Statutory Trust, (3) Wells Fargo Delaware Trust Company, Not in Its Individual Capacity, Except to the Extent Expressly Provided in the Participation Agreement, But as Owner Trustee, (4) Wachovia Mortgage Corporation, (5) Wilmington Trust Company, Not in Its Individual Capacity, Except to the Extent Expressly Provided in the Participation Agreement, But as Lease Indenture Trustee, and (6) Wilmington Trust Company, Not in Its Individual Capacity, Except to the Extent Expressly Provided in the Participation Agreement, But as Pass Through Trustee (Incorporated by reference to Exhibit 10.10 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- 10.19\* Network Lease Agreement Dated as of September 26, 2003, Between NVG Network I Statutory Trust, as Owner Lessor, and TVA, as Lessee (Incorporated by reference to Exhibit 10.11 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)

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- 10.20\* Head Lease Agreement Dated as of September 26, 2003, Between TVA, as Head Lessor, and NVG Network I Statutory Trust, as Head Lessee (Incorporated by reference to Exhibit 10.12 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- 10.21\* Leasehold Security Agreement Dated as of September 26, 2003, Made by NVG Network I Statutory Trust to TVA (Incorporated by reference to Exhibit 10.13 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- 10.22 Facility Lease-Purchase Agreement Dated as of January 17, 2012, Between John Sevier Combined Cycle Generation LLC and TVA (Incorporated by reference to Exhibit 10.1 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2011, File No. 000-52313)
- 10.23 Head Lease Agreement Dated as of January 17, 2012, Among the United States of America, TVA, and John Sevier Combined Cycle Generation LLC (Incorporated by reference to Exhibit 10.2 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2011, File No. 000-52313)
- 10.24\* Asset Purchase Agreement Dated as of August 6, 2013, Between TVA and Seven States Southaven, LLC (Incorporated by reference to Exhibit 10.33 to TVA's Annual Report on Form 10-K for the year ended September 30, 2013, File No. 000-52313)
- 10.25 Facility Lease-Purchase Agreement Dated as of August 9, 2013, Between Southaven Combined Cycle Generation LLC and TVA (Incorporated by reference to Exhibit 10.34 to TVA's Annual Report on Form 10-K for the year ended September 30, 2013, File No. 000-52313)

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- 10.26 Head Lease Agreement Dated as of August 9, 2013, Among the United States of America, TVA, and Southaven Combined Cycle Generation LLC (Incorporated by reference to Exhibit 10.35 to TVA's Annual Report on Form 10-K for the year ended September 30, 2013, File No. 000-52313)
- 10.27\* Federal Facilities Compliance Agreement Between the United States Environmental Protection Agency and TVA (Incorporated by reference to Exhibit 10.2 to TVA's Quarterly Report on Form 10-Q for the quarter ended June 30, 2011, File No. 000-52313)
- 10.28\* Consent Decree Among Alabama, Kentucky, North Carolina, Tennessee, the Alabama Department of Environmental Management, the National Parks Conservation Association, Inc., the Sierra Club, Our Children's Earth Foundation, and TVA (Incorporated by reference to Exhibit 10.3 to TVA's Quarterly Report on Form 10-Q for the quarter ended June 30, 2011, File No. 000-52313)
- 10.29† TVA Compensation Plan Approved by the TVA Board on May 31, 2007, as Amended on August 25, 2016 (Incorporated by Reference to Exhibit 10.28 to TVA's Annual Report on Form 10-K for the year ended September 30, 2016, File No. 000-52313)
- 10.30† Amended and Restated Supplemental Executive Retirement Plan Effective as of May 1, 2015 (Incorporated by reference to Exhibit 10.1 to TVA's Quarterly Report on Form 10-Q for the quarter ended June 30, 2015, File No. 000-52313)
- 10.31† Amended and Restated Executive Annual Incentive Plan Effective as of October 1, 2015 (Incorporated by reference to Exhibit 10.1 to TVA's Current Report on Form 8-K filed on October 1, 2015, File No. 000-52313)
- 10.32† Executive Long-Term Incentive Plan (Incorporated by reference to Exhibit 10.4 to TVA's Current Report on Form 8-K filed on January 6, 2009, File No. 000-52313)
- 10.33† Long-Term Deferred Compensation Plan (Incorporated by reference to Exhibit 10.5 to TVA's Current Report on Form 8-K filed on January 6, 2009, File No. 000-52313)
- 10.34† Deferred Compensation Plan (Incorporated by reference to Exhibit 10.2 to TVA's Current Report on Form 8-K filed on January 6, 2009, File No. 000-52313)
- 10.35† Long-Term Retention Incentive Plan (Incorporated by reference to Exhibit 10.1 to TVA's Quarterly Report on Form 10-Q for the quarter ended March 31, 2014, File No. 000-52313)
- 10.36† Long-Term Incentive Plan Effective as of October 1, 2015 (Incorporated by reference to Exhibit 10.3 to TVA's Current Report on Form 8-K filed on October 1, 2015, File No. 000-52313)
- 10.37† Retention Incentive Plan Effective as of October 1, 2015 (Incorporated by reference to Exhibit 10.2 to TVA's Current Report on Form 8-K filed on October 1, 2015, File No. 000-52313)
- 10.38† Offer Letter to William D. Johnson Approved as of November 1, 2012 (Incorporated by reference to Exhibit 99.1 to TVA's Current Report on Form 8-K filed on November 7, 2012, File No. 000-52313)
- 10.39† Offer Letter to Joseph P. Grimes, Jr., Accepted as of June 18, 2013 (Incorporated by reference to Exhibit 10.37 to TVA's Annual Report on Form 10-K for the year ended September 30, 2014, File No. 000-52313)

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10.40† Offer Letter to Sherry A. Quirk Accepted as of December 29, 2014

10.41† Deferral Agreement Between TVA and William D. Johnson Dated as of January 1, 2013 (Incorporated by reference to Exhibit 10.38 to TVA's Annual Report on Form 10-K for the year ended September 30, 2014, File No. 000-52313)

10.42† Deferral Agreement Between TVA and John M. Thomas, III, Dated as of September 27, 2010 (Incorporated by reference to Exhibit 10.40 to TVA's Annual Report on Form 10-K for the year ended September 30, 2010, File No. 000-52313)

10.43† Deferral Agreement Between TVA and John M. Thomas, III, Dated as of January 4, 2012 (Incorporated by reference to Exhibit 10.45 to TVA's Annual Report on Form 10-K for the year ended September 30, 2012, File No. 000-52313)

10.44† Deferral Agreement Between TVA and John M. Thomas, III, Dated as of April 22, 2013 (Incorporated by reference to Exhibit 10.4 to TVA's Quarterly Report on Form 10-Q for the quarter ended June 30, 2013, File No. 000-52313)



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- 10.45† Deferral Agreement Between TVA and John M. Thomas, III, Dated as of February 27, 2014 (Incorporated by reference to Exhibit 10.43 to TVA's Annual Report on Form 10-K for the year ended September 30, 2014, File No. 000-52313)
- 10.46† Deferral Agreement Between TVA and Joseph P. Grimes, Jr., Dated as of September 5, 2013 (Incorporated by reference to Exhibit 10.45 to TVA's Annual Report on Form 10-K for the year ended September 30, 2014, File No. 000-52313)
- 10.47† Deferral Agreement Between TVA and Michael D. Skaggs Dated as of March 1, 2010 (Incorporated by reference to Exhibit 10.61 to TVA's Annual Report on Form 10-K for the year ended September 30, 2013, File No. 000-52313)
- 10.48† Deferral Agreement Between TVA and Michael D. Skaggs Dated as of March 20, 2013 (Incorporated by reference to Exhibit 10.62 to TVA's Annual Report on Form 10-K for the year ended September 30, 2013, File No. 000-52313)
- 10.49† Long-Term Retention Incentive Plan Award Notice for William D. Johnson for Award Granted as of November 10, 2014 (Incorporated by reference to Exhibit 10.1 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2014, File No. 000-52313)
- 10.50† Long-Term Retention Incentive Plan Award Notice for John M. Thomas, III, for First Award Granted as of January 1, 2015 (Incorporated by reference to Exhibit 10.2 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2014, File No. 000-52313)
- 10.51† Long-Term Retention Incentive Plan Award Notice for John M. Thomas, III, for Second Award Granted as of January 1, 2015 (Incorporated by reference to Exhibit 10.3 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2014, File No. 000-52313)
- 10.52† Long-Term Retention Incentive Plan Award Notice for Joseph P. Grimes, Jr., for Award Granted as of June 1, 2014 (Incorporated by reference to Exhibit 10.56 to TVA's Annual Report on Form 10-K for the year ended September 30, 2015, File No. 000-52313)
- 10.53† Long-Term Retention Incentive Plan Award Notice for Joseph P. Grimes, Jr., for Award Granted as of January 1, 2015 (Incorporated by reference to Exhibit 10.5 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2014, File No. 000-52313)
- 10.54† Long-Term Retention Incentive Plan Award Notice for Michael D. Skaggs for Award Granted as of January 1, 2015 (Incorporated by reference to Exhibit 10.6 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2014, File No. 000-52313)
- 10.55† Retention Incentive Arrangement Between TVA and John M. Thomas, III, Dated as of January 1, 2015 (Incorporated by reference to Exhibit 10.7 to TVA's Quarterly Report on Form 10-Q for the quarter ended December 31, 2014, File No. 000-52313)
- 14.1 Disclosure and Financial Ethics Code (Incorporated by reference to Exhibit 14 to TVA's Annual Report on Form 10-K for the year ended September 30, 2006, File No. 000-52313)
- 14.2 TVA Conflict of Interest Policy, as amended (Incorporated by reference to Exhibit 14.2 to TVA's Annual Report on Form 10-K for the year ended September 30, 2014, File No. 000-52313)

31.1 Rule 13a-14(a)/15d-14(a) Certification Executed by the Chief Executive Officer

31.2 Rule 13a-14(a)/15d-14(a) Certification Executed by the Chief Financial Officer

32.1 Section 1350 Certification Executed by the Chief Executive Officer

32.2 Section 1350 Certification Executed by the Chief Financial Officer

101.INS TVA XBRL Instance Document

101.SCHTVA XBRL Taxonomy Extension Schema

101.CALTVA XBRL Taxonomy Extension Calculation Linkbase

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101.DEF TVA XBRL Taxonomy Extension Definition Linkbase

101.LAB TVA XBRL Taxonomy Extension Label Linkbase

101.PRE TVA XBRL Taxonomy Extension Presentation Linkbase

† Management contract or compensatory arrangement.

\* Certain schedule(s) and/or exhibit(s) have been omitted. TVA hereby undertakes to furnish supplementally copies of any of the omitted schedules and/or exhibits upon request by the Securities and Exchange Commission.