UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

(MARK ONE)
x QUARTERLY REPORT PURSUANT TO SECTION 13, 15(d), OR 37 OF THE SECURITIES EXCHANGE ACT OF 1934
For the quarterly period ended March 31, 2019
OR
o 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 (State or other jurisdiction of incorporation or organization)	62-0474417 (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)

None
(Former name, former address and former fiscal year, if changed since last report)

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 x No o

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 x No o

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.

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

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. o

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

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GLOSSARY OF COMMON ACRONYMS

Following are definitions of terms or acronyms that may be used in this Quarterly Report on Form 10-Q for the quarter ended March 31, 2019 (the "Quarterly 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
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CCR	Coal combustion residuals
CME	Chicago Mercantile Exchange
CO_2	Carbon dioxide
COL	Combined construction and operating license
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
EA	Environmental Assessments
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EPU	Extended Power Update
ESPA	Early Site Permit Application
FASB	Financial Accounting Standards Board
FCM	Futures Commission Merchant
FERC	Federal Energy Regulatory Commission
FTP	Financial Trading Program
GAAP	Accounting principles generally accepted in the United States of America
GHG	Greenhouse gas
GWh	Gigawatt hour(s)
HAP	Hazardous Air Pollutants
IRP	Integrated Resource Plan
JSCCG	John Sevier Combined Cycle Generation LLC
KOC	Knoxville Office Complex
kWh	Kilowatt hour(s)
LPC	TVA's local power company customer
MATS	Mercury and Air Toxics Standards
MD&A	Management's Discussion and Analysis of Financial Condition and Results of Operations
mmBtu	Million British thermal unit(s)
MtM	Mark-to-market
MW	Megawatt
NAAQS	National Ambient Air Quality Standards

NAV	Net asset value

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NDT	Nuclear Decommissioning Trust
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NO_x	Nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NSR	New Source Review
OCI	Other comprehensive income (loss)
OCIP	Owner Controlled Insurance Program
PARRS	Putable Automatic Rate Reset Securities
PM	Particulate matter
QER	Quadrennial Energy Review
QTE	Qualified technological equipment and software
REIT	Real Estate Investment Trust
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
SIPs	State implementation plans
SMR	Small modular reactor(s)
SO_2	Sulfur dioxide
TCWN	Tennessee Clean Water Network
TDEC	Tennessee Department of Environment & Conservation
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
VIE	Variable interest entity
XBRL	eXtensible Business Reporting Language

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FORWARD-LOOKING INFORMATION

This Quarterly 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," 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 or interpretations, including those related to environmental matters, and the costs of complying with these laws, regulations, or administrative orders or interpretations;
- 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 or result in their removal from service, perhaps permanently;
- Significant reductions in demand for electricity produced through non-renewable or centrally located generation sources that 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 or TVA debt ceiling or automatic spending cuts in government programs;
- Costs or 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 TVA's local power company customers ("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 amount or timing of funding obligations associated with TVA's pension plans, other post-retirement benefit plans, or health care plans;
- Increases in TVA's financial liabilities for decommissioning its nuclear facilities or retiring other assets;
- Risks associated with the operation of nuclear facilities, coal combustion residual ("CCR") facilities, or other 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 ("Gallatin") 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, or 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;
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Catastrophic events such as fires, earthquakes, explosions, solar events, electromagnetic pulses ("EMP"), geomagnetic disturbances ("GMDs"), droughts, floods, hurricanes, tornadoes, or other casualty events or pandemics, wars, national emergencies, terrorist activities, or other similar events, especially if these events occur in or near TVA's service area;

- 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;
- Inability to use regulatory accounting or loss of regulatory accounting approval for certain costs;
- The requirement or decision to make additional contributions to TVA's Nuclear Decommissioning Trust ("NDT"), Asset Retirement Trust ("ART") or pension plans;

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- 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”);
- An increase in TVA's cost of capital that 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 or creditworthiness of counterparties;
- Changes in the market price of commodities such as coal, uranium, natural gas, fuel oil, crude oil, construction materials, reagents, electricity, or emission allowances;
- Changes in the market price of equity securities, debt securities, or other investments;
- Changes in interest rates, currency exchange rates, or inflation rates;
- Ineffectiveness of TVA's disclosure controls and procedures or its internal control 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, or 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, or 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 priorities of the TVA Board or TVA senior management; or
- Other unforeseeable events.

See also Item 1A, Risk Factors, and Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations in TVA's Annual Report on Form 10-K for the year ended September 30, 2018 (the "Annual Report"), and Part I, Item 2, Management's Discussion and Analysis of Financial Condition and Results of Operations in this Quarterly Report for a discussion of factors that could cause actual results to differ materially from those in a forward-looking statement. New factors emerge from time to time, and it is not possible for TVA 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 (2019, 2018, etc.) in this Quarterly Report are to TVA's fiscal years ending September 30. Years that are preceded by "CY" are references to calendar years.

Notes

References to "Notes" are to the Notes to Consolidated Financial Statements contained in Part I, Item 1, Financial Statements in this Quarterly Report.

Available Information

TVA's Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and all amendments to those reports, are available on TVA's website, free of charge, as soon as reasonably practicable after such reports are electronically filed with or furnished to the Securities and Exchange Commission ("SEC"). TVA's website is www.tva.gov. Information contained on TVA's website shall not be deemed to be incorporated into, or to be a part of, this Quarterly Report. All TVA SEC reports are available to the public without charge from the website maintained by the SEC at www.sec.gov.

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PART I - FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS

TENNESSEE VALLEY AUTHORITY
CONSOLIDATED STATEMENTS OF OPERATIONS (Unaudited)
(in millions)

	Three Months Ended March 31		Six Months Ended March 31	
	2019	2018	2019	2018
Operating revenues				
Revenue from sales of electricity	$2,712	$2,753	$5,393	$5,262
Other revenue	38	39	82	79
Total operating revenues	2,750	2,792	5,475	5,341
Operating expenses				
Fuel	501	495	942	970
Purchased power	255	273	552	493
Operating and maintenance	800	632	1,545	1,278
Depreciation and amortization	466	436	811	859
Tax equivalents	136	126	268	250
Total operating expenses	2,158	1,962	4,118	3,850
Operating income	592	830	1,357	1,491
Other income (expense), net	14	11	38	23
Other net periodic benefit cost	65	65	129	128
Interest expense	300	314	602	636
Net income (loss)	$241	$462	$664	$750

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

TENNESSEE VALLEY AUTHORITY
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS) (Unaudited)
(in millions)

	Three Months Ended March 31		Six Months Ended March 31	
	2019	2018	2019	2018
Net income (loss)	$241	$462	$664	$750
Other comprehensive income (loss)				
Net unrealized gain (loss) on cash flow hedges	23	44	(29)	83
Reclassification to earnings from cash flow hedges	(14)	(28)	4	(31)
Total other comprehensive income (loss)	9	16	(25)	52
Total comprehensive income (loss)	$250	$478	$639	$802

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

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TENNESSEE VALLEY AUTHORITY
CONSOLIDATED BALANCE SHEETS (Unaudited)
(in millions)
ASSETS

	March 31, 2019	September 30, 2018
Current assets		
Cash and cash equivalents	$ 300	$ 299
Accounts receivable, net	1,394	1,657
Inventories, net	1,016	961
Regulatory assets	241	414
Other current assets	93	86
Total current assets	3,044	3,417
Property, plant, and equipment		
Completed plant	61,712	61,114
Less accumulated depreciation	(29,803)	(29,335)
Net completed plant	31,909	31,779
Construction in progress	1,921	1,999
Nuclear fuel	1,444	1,487
Capital leases	143	149
Total property, plant, and equipment, net	35,417	35,414
Investment funds	2,835	2,862
Regulatory and other long-term assets		
Regulatory assets	6,822	6,612
Other long-term assets	347	362
Total regulatory and other long-term assets	7,169	6,974
Total assets	$ 48,465	$ 48,667

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

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TENNESSEE VALLEY AUTHORITY
CONSOLIDATED BALANCE SHEETS (Unaudited)
(in millions)
LIABILITIES AND PROPRIETARY CAPITAL

	March 31, 2019	September 30, 2018
Current liabilities		
Accounts payable and accrued liabilities	$ 1,597	$ 1,982
Accrued interest	307	305
Current portion of leaseback obligations	40	38
Current portion of energy prepayment obligations	—	10
Regulatory liabilities	195	187
Short-term debt, net	1,617	1,216
Current maturities of power bonds	1,032	1,032
Current maturities of long-term debt of variable interest entities	38	38
Current maturities of notes payable	26	46
Total current liabilities	4,852	4,854
Other liabilities		
Post-retirement and post-employment benefit obligations	4,318	4,476
Asset retirement obligations	4,875	4,665
Other long-term liabilities	2,914	2,715
Leaseback obligations	223	263
Regulatory liabilities	73	104
Total other liabilities	12,403	12,223
Long-term debt, net		
Long-term power bonds, net	19,161	20,157
Long-term debt of variable interest entities, net	1,108	1,127
Long-term notes payable	22	23
Total long-term debt, net	20,291	21,307
Total liabilities	37,546	38,384
Commitments and contingencies		
Proprietary capital		
Power program appropriation investment	258	258
Power program retained earnings	10,069	9,404
Total power program proprietary capital	10,327	9,662
Nonpower programs appropriation investment, net	560	564
Accumulated other comprehensive income (loss)	32	57
Total proprietary capital	10,919	10,283
Total liabilities and proprietary capital	$ 48,465	$ 48,667

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

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TENNESSEE VALLEY AUTHORITY
CONSOLIDATED STATEMENTS OF CASH FLOWS (Unaudited)
For the Six Months Ended March 31
(in millions)

	2019	2018
Cash flows from operating activities		
Net income (loss)	$664	$750
Adjustments to reconcile net income (loss) to net cash provided by operating activities		
Depreciation and amortization[1]	821	875
Amortization of nuclear fuel cost	179	189
Non-cash retirement benefit expense	157	162
Prepayment credits applied to revenue	(10)	(50)
Other regulatory amortization and deferrals	184	(26)
Changes in current assets and liabilities		
Accounts receivable, net	269	230
Inventories and other current assets, net	(83)	19
Accounts payable and accrued liabilities	(274)	(111)
Accrued interest	6	4
Pension contributions	(155)	(154)
Other, net	(11)	(30)
Net cash provided by operating activities	1,747	1,858
Cash flows from investing activities		
Construction expenditures	(862)	(958)
Nuclear fuel expenditures	(172)	(177)
Loans and other receivables		
Advances	(4)	(10)
Repayments	4	2
Other, net	(6)	2
Net cash used in investing activities	(1,040)	(1,141)
Cash flows from financing activities		
Long-term debt		
Issues of power bonds	—	998
Redemptions and repurchases of power bonds	(1,003)	(700)
Redemptions of notes payable	(21)	(18)
Redemptions of debt of variable interest entities	(19)	(29)
Short-term debt issues (redemptions), net	378	(13)
Payments on leases and leasebacks	(40)	(39)
Financing costs, net	—	(3)
Other, net	(1)	(4)
Net cash provided by (used in) financing activities	(706)	192
Net change in cash, cash equivalents, and restricted cash	1	909
Cash, cash equivalents, and restricted cash at beginning of period	322	311
Cash, cash equivalents, and restricted cash at end of period	$323	$1,220
Supplemental disclosures		
Significant non-cash transactions		
Accrued capital and nuclear fuel expenditures	$281	$294

The accompanying notes are an integral part of these consolidated financial statements.
Note
(1) Includes amortization of debt issuance costs and premiums/discounts.

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TENNESSEE VALLEY AUTHORITY
CONSOLIDATED STATEMENTS OF CHANGES IN PROPRIETARY CAPITAL (Unaudited)
For the Three Months Ended March 31, 2019 and 2018
(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 December 31, 2017	$ 258	$ 8,571	$ 570	$ 57	$ 9,456
Net income (loss)	—	464	(2)	—	462
Total other comprehensive income (loss)	—	—	—	16	16
Return on power program appropriation investment	—	(2)	—	—	(2)
Balance at March 31, 2018	$ 258	$ 9,033	$ 568	$ 73	$ 9,932
Balance at December 31, 2018	$ 258	$ 9,827	$ 562	$ 23	$ 10,670
Net income (loss)	—	243	(2)	—	241
Total other comprehensive income (loss)	—	—	—	9	9
Return on power program appropriation investment	—	(1)	—	—	(1)
Balance at March 31, 2019	$ 258	$ 10,069	$ 560	$ 32	$ 10,919

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

TENNESSEE VALLEY AUTHORITY
CONSOLIDATED STATEMENTS OF CHANGES IN PROPRIETARY CAPITAL (Unaudited)
For the Six Months Ended March 31, 2019 and 2018
(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, 2017	$ 258	$ 8,282	$ 572	$ 21	$ 9,133
Net income (loss)	—	754	(4)	—	750
Total other comprehensive income (loss)	—	—	—	52	52
Return on power program appropriation investment	—	(3)	—	—	(3)
Balance at March 31, 2018	$ 258	$ 9,033	$ 568	$ 73	$ 9,932

Balance at September 30, 2018	$ 258	$9,404	$ 564	$ 57	$10,283
Net income (loss)	—	668	(4)	—	664
Total other comprehensive income (loss)	—	—	—	(25)	(25)
Return on power program appropriation investment	—	(3)	—	—	(3)
Balance at March 31, 2019	$ 258	$10,069	$ 560	$ 32	$10,919

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

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)
(Dollars in millions except where noted)

1. Nature of Operations and Summary of Significant Accounting Policies

General

The Tennessee Valley Authority ("TVA") is a corporate agency and instrumentality of the United States ("U.S.") that was created in 1933 by federal legislation in response to a proposal 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 U.S., 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 nearly 10 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 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.

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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 (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. TVA fulfilled its obligation under the TVA Act to repay $1.0 billion of the Power Program Appropriation Investment with the 2014 payment, and therefore this item is no longer a component of rate setting. 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 (2019, 2018, 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

TVA prepares its consolidated interim financial statements in conformity with GAAP for consolidated interim financial information. Accordingly, TVA's consolidated interim financial statements do not include all of the information and notes required by GAAP for annual financial statements. As such, they should be read in conjunction with the audited financial statements for the year ended September 30, 2018, and the notes thereto, which are contained in TVA's Annual Report on Form 10-K for the year ended September 30, 2018 (the "Annual Report"). In the opinion of management, all adjustments (consisting of items of a normal recurring nature) considered necessary for fair presentation are included in the consolidated interim financial statements.

The accompanying consolidated interim 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 8. 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

Certain historical amounts have been reclassified in the accompanying consolidated financial statements to the current presentation. TVA reclassified $65 million and $128 million of net periodic benefit cost from Operating and maintenance expense to Other net periodic benefit cost in the Consolidated Statements of Operations for the three and six months ended March 31, 2018, respectively, as a result of the retrospective presentation of financing costs due to the implementation of the

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new accounting standard for defined benefit plan cost effective for TVA October 1, 2018. TVA also reclassified $13 million from Restricted cash and cash equivalents to Other long-term assets on the Consolidated Balance Sheet at September 30, 2018.

In the March 31, 2018 Consolidated Statements of Cash Flows, amounts previously reported as $(39) million Fuel cost adjustment deferral, $(6) million Fuel cost tax equivalents, and $19 million Other, net were consolidated and presented as $(26) million Other regulatory amortization and deferrals. Additionally, $(17) million in cash flows from operating activities previously recorded as $(12) million Accounts payable and accrued liabilities and $(5) million Regulatory asset costs were reclassified to Other, net.

Cash, Cash Equivalents, and Restricted Cash

Cash includes cash on hand, non-interest bearing cash, and deposit accounts. All highly liquid investments with original maturities of three months or less are considered cash equivalents. Cash and cash equivalents that are restricted, as to withdrawal or use under the terms of certain contractual agreements, are recorded in Other long-term assets in the Consolidated Balance Sheets. Restricted cash and cash equivalents includes cash held in trusts that are currently restricted for TVA economic development loans and for certain TVA environmental programs in accordance with agreements related to compliance with certain environmental regulations. See Note 19 — Legal Proceedings —Environmental Agreements.

The following table provides a reconciliation of cash, cash equivalents, and restricted cash reported in the Consolidated Balance Sheets and Consolidated Statements of Cash Flows:
Cash, Cash Equivalents, and Restricted Cash

	At March 31, 2019	At September 30, 2018
Cash and cash equivalents	$ 300	$ 299
Restricted cash and cash equivalents included in Other long-term assets	23	23
Total Cash, cash equivalents, and restricted cash	$ 323	$ 322

Revenues

TVA recognizes revenue from contracts with customers to depict the transfer of goods or services to customers in an amount to which the entity expects to be entitled in exchange for those goods or services. For the generation and transmission of electricity, this is generally at the time the power is delivered to a metered customer delivery point for the customer's consumption or distribution. As a result, 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 five 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. TVA engages in other arrangements in addition to power sales. Revenue from activities related to TVA’s overall mission (e.g., generation and transmission of power and stewardship of TVA-owned or controlled property) are recorded in Other revenue. Revenues that are not related to the overall mission are recorded in Other income (expense), net.

From time to time, TVA may transfer fiber optic capacity on TVA’s network to telecommunications service carriers and TVA's local power company customers ("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 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.

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 at both March 31, 2019, and September 30, 2018, for accounts receivable. Additionally, loans receivable of $151 million and $138 million at March 31, 2019, and September 30, 2018, respectively, are included in Accounts receivable, net and Other long-term assets and are reported net of allowances for uncollectible accounts of less than $1 million at both March 31, 2019, and September 30, 2018.

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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. The Allen Combined Cycle Plant ("Allen CC") began pre-commercial operations in September 2017, and began commercial operations in April 2018. Cogeneration capability at Johnsonville Combustion Turbine Unit 20 commenced pre-commercial plant operations in September 2017, and was placed in service during December 2017. Estimated revenue of $10 million and $11 million related to these projects was capitalized to offset project costs for the three and six months ended March 31, 2018, respectively. TVA also capitalized related fuel costs for these construction projects of approximately $11 million and $14 million during the three and six months ended March 31, 2018, respectively. No such amounts were capitalized during the three and six months ended March 31, 2019.

Depreciation

TVA accounts for depreciation of its properties using the composite depreciation convention of accounting. Under the composite method, assets with similar economic characteristics are grouped and depreciated as one asset. Depreciation is generally computed on a straight-line basis over the estimated service lives of the various classes of assets. The estimation of asset useful lives requires management judgment, supported by external depreciation studies of historical asset retirement experience. Depreciation rates are determined based on external depreciation studies. These studies are updated at least every five years. Depreciation expense was $424 million and $331 million for the three months ended March 31, 2019 and 2018, respectively. Depreciation expense was $732 million and $649 million for the six months ended March 31, 2019 and 2018, respectively. See Note 5 — Financial Impact for a discussion of the impact of plant closures.

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 2019:

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 post-retirement 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 non-operating expenses. Additionally, the guidance stipulates that only the service cost component of net benefit cost is eligible for capitalization in assets. The guidance requires retrospective presentation of the service and non-service cost components in the Consolidated Statements of Operations.
Effective Date for TVA	October 1, 2018
Effect on the Financial Statements or Other Significant Matters	TVA adopted this standard on a retrospective basis for the prior period presented resulting in lower operating expenses and higher non-operating expenses in the Consolidated Statements of Operations of $129 million and $128 million for the six months ended March 31, 2019 and 2018, respectively. There was no impact on the Consolidated Balance Sheets because TVA has historically capitalized only the service cost component, which is consistent with the new guidance.

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	October 1, 2018
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, unless regulatory accounting is applied. 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. The adoption of this standard did not have a material impact on TVA's financial condition, results of operations, or cash flows because changes in fair value accounting are recognized through regulatory accounting.

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Revenue from Contracts with Customers

Description	This 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 related to 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 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.
Effective Date for TVA	October 1, 2018
Effect on the Financial Statements or Other Significant Matters	TVA adopted this standard using the modified retrospective method with no material changes to the amount or timing of revenue recognition. In accordance with the modified retrospective method, TVA’s previously issued financial statements have not been restated to comply the new accounting standard. TVA recognizes revenue when it satisfies a performance obligation by transferring control to the customer. For the generation and transmission of electricity, this is generally at the time the power is delivered to a metered customer delivery point for a customer's consumption or distribution. As a result, revenues from power sales are recorded as electricity is delivered to customers. TVA utilized certain practical expedients including applying the guidance to open contracts at the date of adoption, applying the guidance to a portfolio of contracts with similar characteristics, and recognizing revenue in the amount for which it has the right to invoice. As a result of adoption of the standard, TVA did not have a cumulative-effect adjustment to proprietary capital.

Statement of Cash Flows - Classification of Certain Cash Receipts and Cash Payments

Description	This standard adds or clarifies guidance on the classification of certain cash receipts and payments on the statement of cash flows as follows: debt prepayment or extinguishment costs, settlement of zero-coupon bonds, contingent consideration payments made after a business combination, proceeds from the settlement of insurance claims, proceeds from the settlement of corporate-owned life insurance policies and bank-owned life insurance policies, distributions received from equity method investees, beneficial interest in securitization transactions, and the application of the predominance principle to separately identifiable cash flows.
Effective Date for TVA	October 1, 2018
Effect on the Financial Statements or Other Significant Matters	TVA's previous treatment of the classification of certain cash receipts and cash payments is consistent with the new standard, and adoption of the standard had no impact on TVA's financial condition, results of operations, or presentation or disclosure of cash flows.

Statement of Cash Flows - Restricted Cash

Description	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.
Effective Date for TVA	October 1, 2018
Effect on the Financial Statements or Other Significant Matters	Adoption of this standard resulted in a change to the beginning-of-period and end-of-period cash and cash equivalents and restricted cash amounts shown on the Consolidated Statements of Cash Flows. TVA applied this standard on a retrospective basis for the prior periods presented.

The following accounting standards have been issued but as of March 31, 2019, were not effective and had not been adopted by TVA:

Derivatives and Hedging - Improvements to Accounting for Hedging Activities

Description	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.
Effective Date for TVA	The new standard is effective for TVA's interim and annual reporting periods beginning October 1, 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 does not expect the adoption of this standard to have a material impact on TVA's financial condition, results of operations, or cash flows.

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Lease Accounting

Description	This guidance changes the provisions of recognition in both the lessee and lessor accounting models. The standard requires entities that lease assets ("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 financing 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 ("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 the fiscal year of adoption and will be required to be applied using a modified retrospective transition.
Effective Date for TVA	The new standard is effective for TVA's interim and annual reporting periods beginning October 1, 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. The standard is expected to impact financial position as adoption will increase the amount of assets and liabilities recognized on TVA's Consolidated Balance Sheets. The standard is not expected to have a material impact on results of operations or cash flows as expense recognition is intended to be substantially the same as the existing standard. TVA plans to elect certain of the practical expedients included in the new standard. TVA has selected a lease system solution and continues to evaluate the completeness of the lease population, the effectiveness of internal control related to leases, and appropriate financial statement disclosure. TVA is also continuing to monitor unresolved industry implementation issues and will analyze the related impacts to lease accounting.

Defined Benefit Plans - Disclosure Requirements

Description	This guidance applies to all employers that sponsor defined benefit pension or other post-retirement plans and modifies or clarifies the disclosure requirements for those plans. The amendments in this update remove disclosures that no longer are considered cost-beneficial, clarify the specific requirements of disclosures, and add disclosure requirements identified as relevant. Entities are required to apply the amendments retrospectively.
Effective Date for TVA	The new standard is effective for TVA's annual reporting periods beginning October 1, 2021. 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.

Customer's Accounting for Implementation Costs in a Cloud Arrangement That Is a Service Contract

Description	This guidance relates to the accounting for a customer's implementation costs in a hosting arrangement that is a service contract. The amendments align the requirements for capitalizing those implementation costs with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software and hosting arrangements that include an internal-use software license. The

	amendments also provide requirements for the classification of the capitalized costs and related expense and cash flows in the financial statements, the application of impairment guidance to the capitalized costs, and the application of abandonment guidance to the capitalized costs. Entities are required to apply the amendments either retrospectively or prospectively to all implementation costs incurred after the adoption date.
Effective Date for TVA	The new standard is effective for TVA's interim and annual reporting periods beginning October 1, 2020. Early adoption is permitted, and TVA is currently evaluating its adoption options.
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.

Financial Instruments - Credit Losses

Description	This guidance eliminates the probable initial recognition threshold in current GAAP and, instead, requires an allowance to be recorded for all expected credit losses for certain financial assets that are not measured at fair value. The allowance for credit losses is based on historical information, current conditions, and reasonable and supportable forecasts. The new standard also makes revisions to the other than temporary impairment model for available-for-sale debt securities. Disclosures of credit quality indicators in relation to the amortized cost of financing receivables are further disaggregated by year of origination.
Effective Date for TVA	The new standard is effective for TVA's interim and annual reporting periods beginning October 1, 2020. 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.

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Fair Value Measurement Disclosure

Description	The guidance changes certain disclosure requirements for fair value measurements. It removes certain disclosure requirements, such as the amount of and reasons for transfers between Level 1 and Level 2 of the fair value hierarchy; the policy for timing of the transfers between levels; and the valuation processes for Level 3 fair value measurements. Some disclosure requirements are added, such as the change in unrealized gains and losses included in other comprehensive income for recurring Level 3 fair value measurements and the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements.
Effective Date for TVA	The new standard is effective for TVA's interim and annual reporting periods beginning October 1, 2020. 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 does not expect the adoption of this standard to have a material impact on TVA's financial condition, results of operations or cash flows. TVA is currently evaluating the potential impact on related disclosures.

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 March 31, 2019	At September 30, 2018
Power receivables	$1,322	$ 1,570
Other receivables	72	87
Accounts receivable, net	$1,394	$ 1,657

Note

Allowance for uncollectible accounts was less than $1 million at March 31, 2019 and September 30, 2018, and therefore is not represented in the table above.

4. Inventories, Net

The table below summarizes the types and amounts of TVA's inventories:

Inventories, Net

	At March 31, 2019	At September 30, 2018
Materials and supplies inventory	$734	$ 725
Fuel inventory	318	266
Renewable energy certificates/emission allowance inventory, net	16	14
Allowance for inventory obsolescence	(52)	(44)
Inventories, net	$1,016	$ 961

5. Plant Closures

Background

TVA must continuously evaluate all generating assets to ensure an optimum energy portfolio that provides safe, clean, and reliable power while maintaining flexibility and fiscal responsibility to the people of the Tennessee Valley. During its August 2018 meeting, the TVA Board approved a plan to perform assessments of Bull Run Fossil Plant ("Bull Run") and Paradise Fossil Plant ("Paradise"). These assessments included resiliency studies for fuel and transmission and financial considerations. TVA also prepared Environmental Assessments ("EAs") pursuant to National Environmental Policy Act ("NEPA"). Results of these assessments were presented to the TVA Board at its February 2019 meeting, and the Board approved the retirement of Paradise Unit 3 by December 2020 and Bull Run by December 2023. Subsequent to the Board approval, TVA determined that Paradise would not be restarted after January 2020 due to the plant's material condition.

Financial Impact

As a result of TVA's decision to accelerate the retirements of Paradise and Bull Run, certain construction projects at these locations were identified as probable of abandonment or were no longer expected to be in service for greater than one year prior to the plants' retirement dates. The write-off of these projects resulted in $124 million of Operating and maintenance expense during the three months ended March 31, 2019. TVA also recognized losses of $11 million in Operating and maintenance expense related to additional materials and supplies inventory reserves and write-offs identified at Paradise during the three months ended March 31, 2019.

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TVA’s policy is to adjust depreciation rates to reflect the most current assumptions, ensuring units will be fully depreciated by the applicable retirement dates. As a result of TVA's decision to accelerate the retirement of Paradise and Bull Run, TVA recognized an additional $115 million of accelerated depreciation for the three months ended March 31, 2019.

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 March 31, 2019	At September 30, 2018
Loans and other long-term receivables, net[1]	$ 144	$ 125
EnergyRight® receivables	86	90
Prepaid capacity payments	23	27
Restricted cash and cash equivalents[1]	23	23
Commodity contract derivative assets	10	31
Other	61	66
Other long-term assets	$ 347	$ 362

Note

(1) Certain historical amounts have been reclassified to conform with current year presentation of Restricted cash and cash equivalents.

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 10 years. TVA purchases the resulting loans receivable from LPCs. The loans receivable are then transferred to a third-party bank with which TVA has agreed to repay in full any loans receivable that have been in default for 180 days or more or that TVA has determined are 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 March 31, 2019, and September 30, 2018, the carrying amount of the loans receivable, net of discount, reported in Accounts receivable, net was approximately $21 million and $22 million, respectively. See Note 10 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 March 31, 2019	At September 30, 2018
Current regulatory assets		
Gallatin coal combustion residual facilities	$26	$ 38
Unrealized losses on interest rate derivatives	78	73
Environmental agreements	—	3
Unrealized losses on commodity contracts	7	4
Environmental cleanup costs – Kingston ash spill	130	266
Fuel cost adjustment receivable	—	30
Total current regulatory assets	241	414
Non-current regulatory assets		
Deferred pension costs and other post-retirement benefits costs	3,000	3,119
Non-nuclear decommissioning costs	1,054	1,019
Nuclear decommissioning costs	856	784
Gallatin coal combustion residual facilities	864	861
Unrealized losses on interest rate derivatives	897	692
Environmental agreements	12	11
Unrealized losses on commodity contracts	7	8
Other non-current regulatory assets	132	118
Total non-current regulatory assets	6,822	6,612
Total regulatory assets	$7,063	$ 7,026
Current regulatory liabilities		
Fuel cost adjustment tax equivalents	$144	$ 146
Fuel cost adjustment	19	—
Unrealized gains on commodity derivatives	32	41
Total current regulatory liabilities	195	187
Non-current regulatory liabilities		
Deferred other post-retirement benefits cost	63	73
Unrealized gains on commodity derivatives	10	31
Total non-current regulatory liabilities	73	104
Total regulatory liabilities	$268	$ 291

8. 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

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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 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.

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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 March 31, 2019, and September 30, 2018, as reflected in the Consolidated Balance Sheets are as follows:
Summary of Impact of VIEs on Consolidated Balance Sheets

	At March 31, 2019	At September 30, 2018
Current liabilities		
Accrued interest	$11	$ 11
Accounts payable and accrued liabilities	2	2
Current maturities of long-term debt of variable interest entities	38	38
Total current liabilities	51	51
Other liabilities		
Other long-term liabilities	27	28
Long-term debt, net		
Long-term debt of variable interest entities, net	1,108	1,127
Total liabilities	$1,186	$ 1,206

Interest expense of $14 million for both the three months ended March 31, 2019 and 2018, and $28 million and $29 million for the six months ended March 31, 2019 and 2018, respectively, is included in the Consolidated Statements of Operations related to debt of VIEs and membership interests of VIEs subject to mandatory redemption.

Creditors of the VIEs have no 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.

9. Gallatin Coal Combustion Residual Facilities

Background

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, alleging that pollutants from Gallatin have been discharged 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, and civil penalties of up to $17,000 per day for each day TVA is found to have violated the statutes. The Tennessee Scenic Rivers Association ("TSRA") and Tennessee Clean Water Network ("TCWN") are also plaintiffs. Trial in this action is scheduled to begin in October 2019.

Lawsuit Brought by TSRA and TCWN. In April 2015, TSRA and TCWN filed a lawsuit against TVA in the U.S. 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 sought 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.

On August 4, 2017, the court issued a decision (the "August 2017 Order") that found 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 did not assess any monetary penalties against TVA for the CWA violations, citing the fact that its order to relocate the CCR materials would cause TVA to incur significant costs.

On October 2, 2017, TVA appealed the court's decision to the United States Court of Appeals for the Sixth Circuit ("Sixth Circuit"). On September 24, 2018, a panel of the Sixth Circuit reversed the district court decision and held that the district court erred by imposing CWA liability against TVA and that, therefore, the imposition of injunctive relief was an abuse of discretion. On October 22, 2018, the plaintiffs filed a petition requesting that the full Sixth Circuit rehear the case. On January 17, 2019, the Sixth Circuit denied the petition. On February 1, 2019, the Sixth Circuit issued its mandate, which made its September 24, 2018, decision final. On April 15, 2019, the plaintiffs requested review by the United States Supreme Court.

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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 facilities project (excluding post-closure care), that began on October 1, 2018, as project costs are incurred. 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 permitting activities for the new facility, design and construction of the new facility onsite at Gallatin, 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 over the 24 year expected 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 plans on completing a capital project related to construction of a permanent bottom ash dewatering facility. This capital project, which is not included in the estimate for cleanup costs above, is estimated to cost approximately $71 million and be completed by 2020.

It is reasonably possible that TVA will be required to move the CCR materials offsite, which would materially increase both the cost and the time to complete the project. 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. It is estimated that the process of obtaining the necessary permits for offsite disposal, locating or constructing an offsite facility, and moving all of the CCR materials offsite would take approximately 40 years.

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.

At March 31, 2019, related liabilities of $864 million and $22 million were recorded in Other long-term liabilities and Accounts payable and accrued liabilities, respectively.

10. Other Long-Term Liabilities

Other long-term liabilities consist primarily of liabilities related to certain derivative agreements, liabilities for environmental remediation, and liabilities under agreements related to compliance with certain environmental regulations. The table below summarizes the types and amounts of Other long-term liabilities:

Other Long-Term Liabilities

	At March 31, 2019	At September 30, 2018
Interest rate swap liabilities	$1,330	$ 1,122
Gallatin coal combustion residual facilities liability	864	862
Capital lease obligations	176	178
Currency swap liabilities	110	81
EnergyRight® financing obligation	96	102
Paradise pipeline financing obligation(1)	80	80
Accrued long-term service agreement(1)	71	74

Other[1]	187	216
Total other long-term liabilities	$2,914	$ 2,715

Note
(1) Certain amounts have been reclassified to conform with current year presentation.

Interest Rate Swap Liabilities. TVA uses interest rate swaps to fix variable short-term debt to a fixed rate. The values of these derivatives are included in Accounts payable and accrued liabilities and Other long-term liabilities on the Consolidated Balance Sheets. As of March 31, 2019, and September 30, 2018, the carrying amount of the interest rate swap liabilities reported in Accounts payable and accrued liabilities was approximately $78 million and $77 million, respectively. See Note 14 —Derivatives Not Receiving Hedge Accounting Treatment — Interest Rate Derivatives for information regarding the interest rate swap liabilities. As of March 31, 2019, Interest rate swap liabilities increased $208 million as compared to September 30, 2018, primarily due to large decreases in interest rates resulting in higher mark-to-market values on future expected net cash flows.

Gallatin Coal Combustion Residual Facilities Liability. The estimated cost of the potential Gallatin CCR project is approximately $900 million. The current and long-term portions of the resulting obligation are reported in Accounts payable and

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accrued liabilities and Other long-term liabilities, respectively, on TVA's Consolidated Balance Sheets. As of March 31, 2019, and September 30, 2018, related liabilities of $22 million and $30 million, respectively, were recorded in Accounts payable and accrued liabilities. See Note 9 for information regarding the Gallatin CCR facilities.

EnergyRight® Financing Obligation. TVA purchases certain loans receivable from 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. The carrying amount of the financing obligation reported in Accounts payable and accrued liabilities for March 31, 2019, and September 30, 2018, was approximately $24 million and $25 million, respectively. See Note 6 for information regarding the associated loans receivable.

Paradise Pipeline Financing Obligation. TVA reserves firm pipeline capacity on an approximately 19 mile pipeline owned by Texas Gas, which serves TVA's Paradise Combined Cycle Plant. The capacity contract contains a lease component due to TVA's exclusive right to use the pipeline. TVA accounts for this lease component as a financing transaction. 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 both March 31, 2019, and September 30, 2018, related liabilities of less than $1 million were recorded in Accounts payable and accrued liabilities.

Accrued Long-Term Service Agreement. TVA has entered into various long-term service agreements for major maintenance activities at certain of its combined cycle plants. TVA uses the direct expense method of accounting for these arrangements. TVA accrues for parts when it takes ownership and for contractor services when they are rendered. Under certain of these agreements, parts received and services rendered exceed payments made. The current and long-term portions of the resulting obligation are reported in Accounts payable and accrued liabilities and Other long-term liabilities, respectively, on TVA's Consolidated Balance Sheets. As of March 31, 2019, and September 30, 2018, related liabilities of $15 million and $30 million, respectively, were recorded in Accounts payable and accrued liabilities.

11. Asset Retirement Obligations

During the six months ended March 31, 2019, TVA's total asset retirement obligations ("ARO") liability increased $198 million as a result of revisions in estimates and periodic accretion, partially offset by settlement activity from ongoing ARO projects at TVA facilities. The nuclear and non-nuclear accretion amounts were deferred as regulatory assets. During the six months ended March 31, 2019, $72 million of the related non-nuclear 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 15 — Investment Funds and Note 19 — Contingencies — Decommissioning Costs for a discussion of the trusts' objectives and the current balances of the trusts.

Asset Retirement Obligation Activity(1)

	Nuclear	Non-Nuclear	Total
Balance at September 30, 2018	$2,989	$ 1,790	$4,779
Settlements	—	(42)	(42)
Revisions in estimate	—	136	136
Additional Obligation	14	—	14
Accretion (recorded as regulatory asset)	67	23	90
Balance at March 31, 2019	$3,070	$ 1,907	$4,977

Note

(1) The current portion of ARO in the amount of $102 million and $115 million is included in Accounts payable and accrued liabilities at March 31, 2019, and September 30, 2018, respectively.

As a result of recent experience in completing settlements at certain facilities, the revisions in non-nuclear estimates increased $103 million primarily due to expected costs for asbestos abatement activities across TVA's fossil fleet. In addition, TVA approved a change in the preferred closure method for the Allen West Impoundment from closure in place to closure by removal, which resulted in a cost increase of $33 million.

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12. Debt and Other Obligations

Debt Outstanding

Total debt outstanding at March 31, 2019, and September 30, 2018, consisted of the following:

Debt Outstanding

	At March 31, 2019	At September 30, 2018
Short-term debt		
Short-term debt, net	$1,617	$ 1,216
Current maturities of power bonds	1,032	1,032
Current maturities of long-term debt of variable interest entities	38	38
Current maturities of notes payable	26	46
Total current debt outstanding, net	2,713	2,332
Long-term debt		
Long-term power bonds[1]	19,298	20,300
Long-term debt of variable interest entities, net	1,108	1,127
Long-term notes payable	22	23
Unamortized discounts, premiums, issue costs, and other	(137)	(143)
Total long-term debt, net	20,291	21,307
Total outstanding debt	$23,004	$ 23,639

Note

(1) Includes net exchange gain from currency transactions of $146 million and $147 million at March 31, 2019, and September 30, 2018, respectively.

Debt Securities Activity

The table below summarizes the long-term debt securities activity for the period from October 1, 2018, to March 31, 2019:

Debt Securities Activity

	Date	Amount[1]	Interest Rate
Redemptions/Maturities			
electronotes®	First Quarter 2019	$ 1	2.65 %
electronotes®	Second Quarter 2019	1	3.48 %
2013 Series A	October 2018	1,000	1.75 %
2009 Series B			