

Tennessee Valley Authority  
Form 10-Q  
May 02, 2019  
Table of Contents

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

FORM 10-Q

(MARK ONE)

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

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

(IRS Employer Identification No.)

incorporation or organization)

400 W. Summit Hill Drive

Knoxville, Tennessee

37902

(Address of principal executive offices) (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  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

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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  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

Table of Contents

Table of Contents

GLOSSARY OF COMMON

<u>ACRONYMS</u> .....	3
<u>FORWARD-LOOKING</u>	
<u>INFORMATION</u> .....	5
<u>GENERAL</u>	
<u>INFORMATION</u> .....	6

PART I - FINANCIAL INFORMATION

ITEM 1. FINANCIAL

<u>STATEMENTS</u> .....	7
Consolidated <u>Statements of Operations (unaudited)</u> .....	7
Consolidated <u>Statements of Comprehensive Income (Loss) (unaudited)</u> .....	7
Consolidated <u>Balance Sheets (unaudited)</u> .....	8
Consolidated <u>Statements of Cash Flows (unaudited)</u> .....	10
Consolidated <u>Statements of Changes in Proprietary Capital (unaudited)</u> .....	11
<u>Notes to Consolidated Financial Statements (unaudited)</u> .....	12

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS..

<u>Executive Overview</u> .....	40
<u>Results of Operations</u> .....	41
<u>Liquidity and Capital Resources</u> .....	52
<u>Key Initiatives and Challenges</u> .....	52
<u>Environmental Matters</u> .....	60
<u>Legal Proceedings</u> .....	60
<u>Off-Balance Sheet Arrangements</u> .....	61
<u>Critical Accounting Policies and Estimates</u> .....	61
<u>New Accounting Standards and Interpretations</u> .....	61
<u>Legislative and Regulatory Matters</u> .....	61
<u>Other Matters</u> .....	61

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET

<u>RISK</u> .....	61
-------------------	----

ITEM 4. CONTROLS AND

<u>PROCEDURES</u> .....	61
<u>Disclosure Controls and Procedures</u> .....	62
<u>Changes in Internal Control over Financial Reporting</u> .....	62

PART II - OTHER INFORMATION

ITEM 1. LEGAL

<u>PROCEEDINGS</u> .....	62
--------------------------	----

ITEM 1A. RISK  
FACTORS.....

68

ITEM 6.  
EXHIBITS.....

69

SIGNATURES.....

70

2

---

Table of Contents

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 <sub>2</sub>	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

3

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Table of Contents

NDT	Nuclear Decommissioning Trust
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NO <sub>x</sub>	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 <sub>2</sub>	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

Table of Contents

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;

Table of Contents

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

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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](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 Quarterly Report. All TVA SEC reports are available to the public without charge from the website maintained by the SEC at [www.sec.gov](http://www.sec.gov).

Table of Contents

## 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.



Table of Contents

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

## ASSETS

	March 31, September 30,	
	2019	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.

Table of Contents

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.



Table of Contents

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 <sup>(1)</sup>	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.

10

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Table of Contents

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

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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.

Table of Contents

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

(Dollars in millions except where noted)

Note	Page
1 Nature of Operations and Summary of Significant Accounting Policies	<u>12</u>
2 Impact of New Accounting Standards and Interpretations	<u>15</u>
3 Accounts Receivable, Net	<u>18</u>
4 Inventories, Net	<u>18</u>
5 Plant Closures	<u>18</u>
6 Other Long-Term Assets	<u>19</u>
7 Regulatory Assets and Liabilities	<u>20</u>
8 Variable Interest Entities	<u>20</u>
9 Gallatin Coal Combustion Residual Facilities	<u>22</u>
10 Other Long-Term Liabilities	<u>23</u>
11 Asset Retirement Obligations	<u>24</u>
12 Debt and Other Obligations	<u>25</u>
13 Accumulated Other Comprehensive Income (Loss)	<u>26</u>
14 Risk Management Activities and Derivative Transactions	<u>27</u>
15 Fair Value Measurements	<u>33</u>
16 Revenue	<u>38</u>
17 Other Income (Expense), Net	<u>42</u>
18 Benefit Plans	<u>42</u>
19 Contingencies and Legal Proceedings	<u>43</u>

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.

## Table of Contents

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

Table of Contents

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.

Table of Contents

## 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	<p>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.</p>
Effective Date for TVA	<p>October 1, 2018</p>
Effect on the Financial Statements or Other Significant Matters	<p>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.</p>

Table of Contents

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

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.

**Effect on the Financial Statements or Other Significant Matters**

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

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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.

Table of Contents

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. 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.
Effect on the Financial Statements or Other Significant Matters	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
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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** TVA is currently evaluating the potential impact of these changes on its consolidated financial statements and related disclosures.

**Significant Matters**

### Financial Instruments - Credit Losses

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.

**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** TVA is currently evaluating the potential impact of these changes on its consolidated financial statements and related disclosures.

**Significant Matters**

Table of Contents

## 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.

Table of Contents

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 <sup>(1)</sup>	\$ 144	\$ 125
EnergyRight <sup>®</sup> receivables	86	90
Prepaid capacity payments	23	27
Restricted cash and cash equivalents <sup>(1)</sup>	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<sup>®</sup> 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.

Table of Contents

## 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

20

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Table of Contents

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.

Table of Contents

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.

Table of Contents

## 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 <sup>(1)</sup>	80	80
Accrued long-term service agreement <sup>(1)</sup>	71	74

Other <sup>(1)</sup>	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

Table of Contents

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<sup>(1)</sup>

	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.

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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.

Table of Contents

## 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 <sup>(1)</sup>	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 <sup>(1)</sup>	Interest Rate
Redemptions/Maturities			
electronotes <sup>®</sup>	First Quarter 2019	\$ 1	2.65 %
electronotes <sup>®</sup>	Second Quarter 2019	1	3.48 %
2013 Series A	October 2018	1,000	1.75 %
2009 Series B	December 2018	1	3.77 %
Total redemptions/maturities of power bonds		1,003	
Notes payable		21	0.84 %
Debt of variable interest entities		19	4.31 %
Total redemptions/maturities of debt		\$ 1,043	

## Note

(1) All redemptions were at 100 percent of par.

## 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 in 2018

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with a maturity date of September 30, 2019. 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 U.S. with maturities from date of issue of one year or less. There were no outstanding borrowings under the facility at March 31, 2019. The availability of this credit facility may be impacted by how the U.S. government addresses the possibility of approaching its debt limit.

Table of Contents

TVA also has funding available under four long-term revolving credit facilities totaling \$2.7 billion: a \$150 million credit facility that matures on December 11, 2021, a \$500 million credit facility that matures on February 1, 2022, a \$1.0 billion credit facility that matures on June 13, 2023, and a \$1.0 billion credit facility that matures on September 28, 2023. 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 March 31, 2019, and September 30, 2018, there were approximately \$932 million and \$921 million, respectively, of letters of credit outstanding under these facilities, and there were no borrowings outstanding. See Note 14 — 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 March 31, 2019

	Facility Limit	Letters of Credit Outstanding	Cash Borrowings	Availability
Maturity Date				
December 2021	\$ 150	\$ 38	\$ —	\$ 112
February 2022	500	500	—	—
June 2023	1,000	213	—	787
September 2023	1,000	181	—	819
Total	\$2,650	\$ 932	\$ —	\$ 1,718

## Lease/Leasebacks

TVA previously entered into leasing transactions to obtain third-party financing for 24 peaking combustion turbine units ("CTs") as well as certain qualified technological equipment and software (collectively, "QTE"). Due to TVA's continuing involvement with the combustion turbine facilities and the QTE during the leaseback term, TVA accounted for the lease proceeds as financing obligations. At March 31, 2019, and September 30, 2018, the outstanding leaseback obligations related to the remaining CTs and QTE were \$263 million and \$301 million, respectively. In March 2019, TVA made final rent payments under lease/leaseback transactions involving eight CTs, and TVA had previously acquired the equity interests related to these transactions. Final rent payments are scheduled to be made under the remaining CT lease/leaseback transactions on various dates from May 2020 to January 2022. TVA has already acquired the equity interests related to transactions involving eight of these CTs and will have the option to acquire the equity interests related to transactions involving remaining eight CTs for additional amounts.

## 13. Accumulated Other Comprehensive Income (Loss)

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 and any related accrued interest in net income and marks its currency swap assets and liabilities to market 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. During the three months ended March 31, 2019 and 2018, TVA reclassified \$14 million and \$28 million of gains, respectively, related to its cash flow hedges from AOCI to Interest expense. During the six months ended March 31, 2019 and 2018, TVA reclassified \$4 million of losses and \$31 million of gains, respectively, related to its cash flow hedges from AOCI to Interest expense.

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 statements of operations are recorded as regulatory assets or regulatory liabilities. See Note 7 for a schedule of regulatory assets and liabilities. See Note 14 for a discussion of the recognition in AOCI of gains and losses associated with certain derivative contracts. See Note 15 for a discussion of the recognition of certain investment fund gains and losses as regulatory assets and liabilities. See Note 18 for a discussion of the regulatory accounting related to components of TVA's benefit plans.

Table of Contents

## 14. 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 historically 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 Financial Trading Program ("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 Accumulated Other Comprehensive Income (Loss)

Derivatives in Cash Flow Hedging Relationship	Objective of Hedge Transaction	Accounting for Derivative Hedging Instrument	Amount of Mark-to-Market Gain (Loss) Recognized in Accumulated Other Comprehensive Income (Loss)	
			Three Months Ended March 31	Six Months Ended March 31
			2019	2018
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	\$23	\$83
			\$44	\$(29)

## Summary of Derivative Instruments That Receive Hedge Accounting Treatment (part 2)

Amount of Gain (Loss) Reclassified from Accumulated Other Comprehensive Income to Interest Expense<sup>(1)</sup>

Derivatives in Cash Flow Hedging Relationship	Amount of Gain (Loss) Reclassified from Accumulated Other Comprehensive Income to Interest Expense <sup>(1)</sup>	
	Three Months Ended March 31	Six Months Ended March 31
	2019	2018
Currency swaps	\$14	\$31
	\$28	\$(4)

## 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 \$40 million

of gains from AOCI to interest expense within the next 12 months to offset amounts anticipated to be recorded in interest expense related to net exchange gain on the debt.

27

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Table of ContentsSummary of Derivative Instruments That Do Not Receive Hedge Accounting Treatment  
Amount of Gain (Loss) Recognized in Income on Derivatives<sup>(1)</sup>

Derivative Type	Objective of Derivative	Accounting for Derivative Instrument	Three Months Ended March 31		Six Months Ended March 31	
			2019	2018	2019	2018
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	\$(19)	\$(23)	\$(39)	\$(47)
Commodity contract derivatives	To protect against fluctuations in market prices of purchased coal or natural gas (price risk)	Mark-to-market gains and losses are recorded as regulatory assets or liabilities  Realized gains and losses due to contract settlements are recognized in fuel expense as incurred	—	3	—	—
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	—	—	—	(8 )

## 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 three and six months ended March 31, 2019 and 2018.

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Table of Contents

Fair Values of TVA Derivatives

	At March 31, 2019		At September 30, 2018	
Derivatives That Receive Hedge Accounting Treatment:	Balance	Balance Sheet Presentation	Balance	Balance Sheet Presentation
<b>Currency swaps</b>				
£200 million Sterling	\$(72)	Accounts payable and accrued liabilities \$(5); Other long-term liabilities \$(67)	\$(67)	Accounts payable and accrued liabilities \$(5); Other long-term liabilities \$(62)
£250 million Sterling	(25)	Accounts payable and accrued liabilities \$(5); Other long-term liabilities \$(20)	(12)	Accounts payable and accrued liabilities \$(5); Other long-term liabilities \$(7)
£150 million Sterling	(26)	Accounts payable and accrued liabilities \$(3); Other long-term liabilities \$(23)	(15)	Accounts payable and accrued liabilities \$(3); Other long-term liabilities \$(12)
<b>Derivatives That Do Not Receive Hedge Accounting Treatment:</b>				
	Balance	Balance Sheet Presentation	Balance	Balance Sheet Presentation
<b>Interest rate swaps</b>				
\$1.0 billion notional	\$(1,020)	Accounts payable and accrued liabilities \$(56); Other long-term liabilities \$(964)	\$(878)	Accounts payable and accrued liabilities \$(56); Other long-term liabilities \$(822)
\$476 million notional	(383)	Accounts payable and accrued liabilities \$(20); Other long-term liabilities \$(363)	(317)	Accounts payable and accrued liabilities \$(20); Other long-term liabilities \$(297)
\$42 million notional	(5)	Accounts payable and accrued liabilities \$(2); Other long-term liabilities \$(3)	(4)	Accounts payable and accrued liabilities \$(1); Other long-term liabilities \$(3)
Commodity contract derivatives	28	Other current assets \$32; Other long-term assets \$10; Other long-term liabilities \$(7); Accounts payable and accrued liabilities \$(7)	60	Other current assets \$41; Other long-term assets \$31; Other long-term liabilities \$(8); Accounts payable and accrued liabilities \$(4)

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 three currency swaps outstanding as of March 31, 2019, with total currency exposure of £600 million and expiration dates ranging from 2021 to 2043.

When the dollar strengthens against the British pound sterling, the exchange gain on the Bond liability and related accrued interest 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 and related accrued interest 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 and related accrued interest are included in Long-term debt, net and Accounts payable and accrued liabilities, respectively. 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 mark-to-market ("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 three months ended March 31, 2019 and 2018, the changes in fair market value of the interest rate swaps resulted in the deferral of unrealized losses of \$99 million and unrealized gains of \$143 million, respectively. For the six months ended March 31, 2019 and 2018, the changes in fair market value of the interest rate swaps resulted in the deferral of unrealized losses of \$209 million and unrealized gains of \$171 million, respectively.

Table of Contents

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 market values as regulatory assets or liabilities on a gross basis. At March 31, 2019, TVA's coal contract derivatives had terms of up to two years, and TVA's natural gas contract derivatives had terms of up to three years.

## Commodity Contract Derivatives

	At March 31, 2019			At September 30, 2018		
	Number of Contracts	Notional Amount	Fair Value (MtM)	Number of Contracts	Notional Amount	Fair Value (MtM)
Coal contract derivatives	16	15 million tons	\$ 38	13	20 million tons	\$ 58
Natural gas contract derivatives	42	360 million mmBtu	\$(10 )	61	359 million mmBtu	\$ 2

Derivatives Under FTP. TVA has suspended its FTP and no longer uses financial instruments to hedge risks related to commodity prices. Prior to the suspension of the FTP, TVA deferred all FTP unrealized gains (losses) as regulatory liabilities (assets) and recorded only realized gains or losses to match the delivery period of the underlying commodity. TVA did not experience any unrealized gains and losses related to the FTP at March 31, 2019 or September 30, 2018. TVA experienced the following realized losses related to the FTP during the periods set forth in the table below:

## Financial Trading Program Realized Gains (Losses)

	Three Months Ended March 31 2019	2018	Six Months Ended March 31 2018
Decrease (increase) in fuel expense			
Natural gas	\$ —	\$ —	\$(6 )
Decrease (increase) in purchased power expense			
Natural gas	—	—	(2 )

Table of Contents

## Offsetting of Derivative Assets and Liabilities

The amounts of TVA's derivative instruments as reported in the Consolidated Balance Sheets at March 31, 2019, and September 30, 2018, are shown in the table below:

## Derivative Assets and Liabilities

	At March 31, 2019		
	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>
Assets			
Commodity derivatives not subject to master netting or similar arrangement	\$42	\$ —	—\$ 42
Liabilities			
Currency swaps <sup>(3)</sup>	\$123	\$ —	—\$ 123
Interest rate swaps <sup>(3)</sup>	1,408	—	1,408
Total derivatives subject to master netting or similar arrangement	1,531	—	1,531
Commodity derivatives not subject to master netting or similar arrangement	14	—	14
Total liabilities	\$1,545	\$ —	—\$ 1,545

	At September 30, 2018		
	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>
Assets			
Commodity derivatives not subject to master netting or similar arrangement	\$72	\$ —	—\$ 72
Liabilities			
Currency swaps <sup>(3)</sup>	\$94	\$ —	—\$ 94
Interest rate swaps <sup>(3)</sup>	1,199	—	1,199
Total derivatives subject to master netting or similar arrangement	1,293	—	1,293
Commodity derivatives not subject to master netting or similar arrangement	12	—	12
Total liabilities	\$1,305	\$ —	—\$ 1,305

## 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 that are not offset in the Consolidated Balance Sheets.

(3) Letters of credit of approximately \$932 million and \$921 million were posted as collateral at March 31, 2019, and September 30, 2018, 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 Nuclear Decommissioning Trust ("NDT"), the Asset Retirement Trust ("ART"), the Supplemental Executive Retirement Plan ("SERP"), and the TVA Deferred Compensation Plan ("DCP"). See Note 15 — Investment Funds for a discussion of the trusts, plans, and types of investments. The NDT and ART may invest in derivative instruments which may include swaps, futures, options, forwards, and other instruments. At March 31, 2019, and September 30, 2018, the NDT held investments in forward contracts to purchase debt securities. The fair values of these derivatives were in net asset positions totaling \$59 million and \$45 million at March 31, 2019, and September 30, 2018, respectively.

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 March 31, 2019, the aggregate fair value of all derivative instruments with credit-risk related contingent features that were in a liability position was \$1.5 billion. TVA's collateral obligations at March 31, 2019, under these arrangements were approximately \$1.0 billion, for which TVA had posted approximately \$932 million in letters of credit. These letters of credit reduce

## Table of Contents

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. 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. See Note 1 — Allowance for Uncollectible Accounts and Note 3.

**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 March 31, 2019. 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, restructuring, 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.

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.

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 the physical or financial derivative transactions defaults, TVA might incur substantial costs in connection with entering into a replacement 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 March 31, 2019, all of TVA's 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 March 31, 2019, 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 Baa2. At March 31, 2019, 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 March 31, 2019, was approximately \$42 million.

Table of Contents

15. 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. These
- 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.  
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
- Level 3— 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.

Investment Funds

At March 31, 2019, Investment funds were composed of \$2.8 billion of equity securities and debt securities classified as trading measured at fair value. Equity and trading debt 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 \$2.1 billion and \$698 million, respectively, at March 31, 2019.

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. 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 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, private real estate investments, and private credit 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 \$142 million, unfunded commitments related to private real estate

Table of Contents

of \$26 million, and unfunded commitments related to private credit of \$11 million at March 31, 2019. The ART had unfunded commitments related to private equity limited partnerships of \$59 million, unfunded commitments related to private real estate of \$11 million, and unfunded commitments related to private credit of \$6 million at March 31, 2019. These investments have no redemption or limited redemption options and may also impose restrictions on the NDT's and ART's ability to liquidate their investments. There are no readily available quoted exchange prices for these investments. During the second quarter of 2019, TVA transitioned its valuation methodology for determining the fair value of these investments. The fair value of the investments is now based on TVA's ownership percentage of the fair value of the underlying investments and estimated by TVA utilizing public market equivalent benchmarks. The fair value of these investments were previously based on information provided by the investment managers. These investments are typically valued on a quarterly basis. TVA's private equity limited partnerships, private real estate investments, and private credit 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 equity and trading debt 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 equity and trading debt securities held during each period as follows:

## Unrealized Investment Gains (Losses)

		Three Months Ended March 31	Six Months Ended March 31	
Fund	Financial Statement Presentation	2019	2018	2019
SERP	Other income (expense)	\$5	\$(2)	\$(1)
DCP	Other income (expense)	1	(1)	(2)
NDT	Regulatory asset	154	(75)	(47)
ART	Regulatory asset	52	(14)	(52)
				6

## Currency and Interest Rate Derivatives

See Note 14 — 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.

## 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.

#### 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

Table of Contents

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 2017) 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 March 31, 2019.

## 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 as of March 31, 2019, and September 30, 2018. 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 March 31, 2019

	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	\$ 258	\$ —	\$ —	\$258
Government debt securities	219	50	—	269
Corporate debt securities	—	504	—	504
Mortgage and asset-backed securities	—	34	—	34
Institutional mutual funds	224	—	—	224
Forward debt securities contracts	—	59	—	59
Private credit measured at net asset value <sup>(1)</sup>	—	—	—	19
Private equity funds measured at net asset value <sup>(1)</sup>	—	—	—	140
Private real estate funds measured at net asset value <sup>(1)</sup>	—	—	—	128
Commingled funds measured at net asset value <sup>(1)</sup>	—	—	—	1,200
Total investments	701	647	—	2,835
Commodity contract derivatives	—	2	40	42
Total	\$ 701	\$ 649	\$ 40	\$2,877

	Quoted Prices in Active Markets for Identical Liabilities (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
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Liabilities

Currency swaps <sup>(2)</sup>	\$ —	\$ 123	\$ —	\$ 123
Interest rate swaps	—	1,408	—	1,408
Commodity contract derivatives	—	12	2	14
Total	\$ —	\$ 1,543	\$ 2	\$ 1,545

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) 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 14 — Offsetting of Derivative Assets and Liabilities.

Table of Contents

## Fair Value Measurements

At September 30, 2018

	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	\$ 220	\$ —	\$ —	\$220
Government debt securities	199	37	—	236
Corporate debt securities	—	499	—	499
Mortgage and asset-backed securities	—	50	—	50
Institutional mutual funds	126	—	—	126
Forward debt securities contracts	—	45	—	45
Private equity funds measured at net asset value <sup>(1)</sup>	—	—	—	132
Private real estate funds measured at net asset value <sup>(1)</sup>	—	—	—	124
Commingled funds measured at net asset value <sup>(1)</sup>	—	—	—	1,430
Total investments	545	631	—	2,862
Commodity contract derivatives	—	13	59	72
Total	\$ 545	\$ 644	\$ 59	\$2,934

	Quoted Prices in Active Markets for Identical Liabilities (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
Liabilities				
Currency swaps <sup>(2)</sup>	\$ —	\$ 94	\$ —	\$94
Interest rate swaps	—	1,199	—	1,199
Commodity contract derivatives	—	11	1	12
Total	\$ —	\$ 1,304	\$ 1	\$1,305

## 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) 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 14 — Offsetting of Derivative Assets and Liabilities.

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.

Table of Contents

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	
	Three Months Ended March 31	Six Months Ended March 31
Balance at beginning of period	\$(73)	\$(67 )
Change in net unrealized gains (losses) deferred as regulatory assets and liabilities	21	15
Balance at March 31, 2018	\$(52)	\$(52 )
Balance at beginning of period	\$63	\$58
Change in net unrealized gains (losses) deferred as regulatory assets and liabilities	(25 )	(20 )
Balance at March 31, 2019	\$38	\$38

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 March 31, 2019	Valuation Technique(s)	Unobservable Inputs	Range
<b>Assets</b>				
Commodity contract derivatives	\$ 40	Pricing model	Coal supply and demand Long-term market prices	0.6 - 0.8 billion tons/year \$12.30 - \$106.21/ton
<b>Liabilities</b>				
Commodity contract derivatives	\$( 2 )	Pricing model	Coal supply and demand Long-term market prices	0.6 - 0.8 billion tons/year \$12.30 - \$106.21/ton

Quantitative Information about Level 3 Fair Value Measurements

	Fair Value at September 30, 2018	Valuation Technique(s)	Unobservable Inputs	Range
<b>Assets</b>				
Commodity contract derivatives	\$ 59	Pricing model	Coal supply and demand Long-term market prices	0.7 - 0.8 billion tons/year \$12.25 - \$112.24/ton
<b>Liabilities</b>				
Commodity contract derivatives	\$ 1	Pricing model	Coal supply and demand	0.7 - 0.8 billion tons/year \$12.25 - \$112.24/ton

Long-term market  
prices

Table of Contents

## Other Financial Instruments Not Recorded at Fair Value

TVA uses the methods and assumptions described below to estimate the fair value of each significant class of financial instrument. The fair value of the financial instruments held at March 31, 2019, and September 30, 2018, 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 March 31, 2019, and September 30, 2018, were as follows:

## Estimated Values of Financial Instruments Not Recorded at Fair Value

	Valuation Classification	At March 31, 2019		At September 30, 2018	
		Carrying Amount	Fair Value	Carrying Amount	Fair Value
EnergyRight® receivables (including current portion)	Level 2	\$107	\$106	\$112	\$112
Loans and other long-term receivables, net (including current portion)	Level 2	\$151	\$136	\$138	\$123
EnergyRight® financing obligation (including current portion)	Level 2	\$120	\$135	\$127	\$143
Unfunded loan commitments	Level 2	\$—	\$5	\$—	\$3
Membership interest of variable interest entities subject to mandatory redemption (including current portion)	Level 2	\$29	\$36	\$30	\$37
Long-term outstanding power bonds (including current maturities), net	Level 2	\$20,193	\$24,180	\$21,189	\$23,896
Long-term debt of variable interest entities (including current maturities), net	Level 2	\$1,146	\$1,299	\$1,165	\$1,256
Long-term notes payable (including current maturities)	Level 2	\$48	\$47	\$69	\$68

The carrying value of Cash and cash equivalents, Restricted cash and cash equivalents, and Short-term debt, net 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 and membership interests of VIE 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.

## 16. Revenue

As described in Note 2, TVA adopted Revenue from Contracts with Customers effective October 1, 2018, using the modified retrospective method of adoption, which does not require restatement of prior year reported results. As a result of the adoption of this standard, no cumulative effect adjustment was recorded. Additionally, comparative disclosures for 2018 operating results with the previous revenue recognition rules are not applicable as TVA's revenue recognition has not materially changed as a result of the new standard.

Revenue from Sales of Electricity

TVA's revenue from contracts with customers is primarily derived from the generation and sale of electricity to its customers and is included in Revenue from sales of electricity on the Consolidated Statements of Operations. Electricity is sold primarily to LPCs for distribution to their end-use customers. In addition, TVA sells electricity to directly served industrial companies, federal agencies, and others.

Table of Contents

LPC sales

Approximately 93 percent of TVA's revenue from sales of electricity is to LPCs, which then distribute the power to their customers using their own distribution systems. Power is delivered to each LPC at delivery points within the LPC's service territory. TVA recognizes revenue when the customer takes possession of the power at the delivery point. For power sales, the performance obligation to deliver power is satisfied in a series over time because the sales of electricity over the term of the customer contract are a series of distinct goods that are substantially the same and have the same pattern of transfer to the customer. TVA has no continuing performance obligations subsequent to delivery. Using the output method for revenue recognition provides a faithful depiction of the transfer of electricity as customers obtain control of the power and benefit from its use at delivery. Additionally, TVA has an enforceable right to consideration for energy delivered at any discrete point in time and will recognize revenue at an amount that reflects the consideration to which TVA is entitled for the energy delivered.

The amount of revenue is based on contractual prices approved by the TVA Board. Customers are invoiced monthly for power delivered as measured by meters located at the delivery points. The net transaction price is offset by certain credits available to customers that are known at the time of billing. Credits are designed to achieve objectives of the TVA Act and include items such as hydro preference credits for residential customers of LPCs, economic development credits to promote growth in the Tennessee Valley, and interruptible credits allowing TVA to reduce industrial customer usage in periods of peak demand to balance system demand. Payments are typically due within approximately one month of invoice issuance.

Directly served customers

Directly served customers, including industrial customers, federal agencies, and other customers, take power for their own consumption. Similar to LPCs, power is delivered to a delivery point, at which time the customer takes possession and TVA recognizes revenue. For all power sales, the performance obligation to deliver power is satisfied in a series over time since the sales of electricity over the term of the customer contract are a series of distinct goods that are substantially the same and have the same pattern of transfer to the customer. TVA has no continuing performance obligations subsequent to delivery. Using the output method for revenue recognition provides a faithful depiction of the transfer of electricity as customers obtain control of the power and benefit from its use at delivery. Additionally, TVA has an enforceable right to consideration for energy delivered at any discrete point in time and will recognize revenue at an amount that reflects the consideration to which TVA is entitled for the energy delivered.

The amount of revenue is based on contractual prices approved by the TVA Board. Customers are invoiced monthly for power delivered as measured by meters located at the delivery points. The net transaction price is offset by certain credits available to customers that are known at the time of billing. Examples of credits include items such as economic development credits to promote growth in the Tennessee Valley and interruptible credits allowing TVA to reduce industrial customer usage in periods of peak demand to balance system demand. Payments are typically due within approximately one month of invoice issuance.

Other Revenue

Other revenue consists primarily of wheeling and network transmission charges, sales of excess steam that is a by-product of power production, delivery point charges for interconnection points between TVA and the customer, and certain other ancillary goods or services.



Table of Contents

## Disaggregated Revenue

During the three and six months ended March 31, 2019, revenues generated from TVA's electricity sales were \$2.7 billion and \$5.4 billion, respectively, and accounted for virtually all of TVA's revenues. TVA's revenues by state for the three and six months ended March 31, 2019 and 2018 are detailed in the table below:

## Operating Revenues By State

(in millions)

	Three Months		Six Months	
	Ended		Ended	
	March 31		March 31	
	2019	2018	2019	2018
Alabama	\$387	\$406	\$779	\$767
Georgia	70	73	137	136
Kentucky	173	174	341	333
Mississippi	249	252	501	489
North Carolina	21	20	41	36
Tennessee	1,799	1,822	3,568	3,482
Virginia	13	14	25	26
Subtotal	2,712	2,761	5,392	5,269
Off-system sales	—	2	1	4
Revenue capitalized during pre-commercial plant operations <sup>(1)</sup>	—	(10 )	—	(11 )
Revenue from sales of electricity	2,712	2,753	5,393	5,262
Other revenues	38	39	82	79
Total operating revenues	\$2,750	\$2,792	\$5,475	\$5,341

## Note

(1) Represents revenue capitalized during pre-commercial operations of \$10 million and \$11 million for the three and six months ended March 31, 2018, respectively. See Note 1 — Pre-Commercial Plant Operations.

TVA's revenues by customer type for the three and six months ended March 31, 2019 and 2018 are detailed in the table below:

## Operating Revenues by Customer Type

(in millions)

	Three Months		Six Months	
	Ended		Ended	
	March 31		March 31	
	2019	2018	2019	2018
Revenue from sales of electricity				
Local power companies	\$2,514	\$2,564	\$4,981	\$4,880
Industries directly served	168	168	353	333
Federal agencies and other	30	31	59	60
Revenue capitalized during pre-commercial plant operations <sup>(1)</sup>	—	(10 )	—	(11 )
Revenue from sales of electricity	2,712	2,753	5,393	5,262
Other revenues	38	39	82	79
Total operating revenues	\$2,750	\$2,792	\$5,475	\$5,341

## Note

(1) Represents revenue capitalized during pre-commercial operations of \$10 million and \$11 million for the three and six months ended March 31, 2018, respectively. See Note 1 — Pre-Commercial Plant Operations.



Table of Contents

The number of LPCs with the contract arrangements described below, the revenues derived from such arrangements for the three and six months ended March 31, 2019, and the percentage of TVA's total operating revenues for the three and six months ended March 31, 2019 represented by these revenues are summarized in the tables below:

## TVA Local Power Company Contracts

At March 31, 2019

Contract Arrangements <sup>(1)</sup>	Number of LPCs	Sales to LPCs in the Three Months Ended March 31, 2019 (in millions)	Percentage of Total Operating Revenues in the Three Months Ended March 31, 2019
20-year termination notice	3	\$ 34	1.2 %
15-year termination notice	11	127	4.6 %
12-year termination notice	1	6	0.2 %
10-year termination notice	52	862	31.3 %
6-year termination notice	1	13	0.5 %
5-year termination notice	86	1,472	53.5 %
Total	154	\$ 2,514	91.3 %

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.

## TVA Local Power Company Contracts

At March 31, 2019

Contract Arrangements <sup>(1)</sup>	Number of LPCs	Sales to LPCs in the Six Months Ended March 31, 2019 (in millions)	Percentage of Total Operating Revenues in the Six Months Ended March 31, 2019
20-year termination notice	3	\$ 67	1.2 %
15-year termination notice	11	251	4.6 %
12-year termination notice	1	12	0.2 %
10-year termination notice	52	1,714	31.3 %
6-year termination notice	1	25	0.5 %
5-year termination notice	86	2,912	53.2 %
Total	154	\$ 4,981	91.0 %

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.

TVA's two largest LPCs — Memphis Light, Gas and Water Division ("MLGW") and Nashville Electric Service ("NES") — have contracts with a five-year and a 10-year termination notice period, respectively. Sales to MLGW and NES both accounted for eight percent of TVA's total operating revenues during the six months ending March 31, 2019.

#### Contract Balances

Contract assets represent an entity's right to consideration in exchange for goods and services that the entity has transferred to customers. TVA does not have any material contract assets as of March 31, 2019.

Contract liabilities represent an entity's obligations to transfer goods or services to customers for which the entity has received consideration (or an amount of consideration is due) from the customers. These contract liabilities are primarily related to upfront consideration received prior to the satisfaction of the performance obligation.

**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 15 years. TVA accounted for the prepayment as unearned revenue and reported the obligation to deliver power under this arrangement as Energy prepayment obligations and Current portion of energy prepayment obligations on the September 30, 2018 Consolidated Balance Sheet. TVA recognized approximately \$100 million of noncash revenue in each year of the arrangement as electricity was delivered to MLGW based on the ratio of units of kilowatt hours delivered to total units of kilowatt hours under contract. At March 31, 2019, \$1.5 billion had been recognized as

Table of Contents

noncash revenue on a cumulative basis during the life of the agreement, \$25 million of which was recognized as noncash revenue and a corresponding reduction in the balance of Energy prepayment obligations during the three months ended March 31, 2018. There was no recognized noncash revenue during the three months ended March 31, 2019. During the six months ended March 31, 2019 and 2018, \$10 million and \$50 million, respectively, were recognized as noncash revenue and a corresponding reduction in the balance of Energy prepayment obligations. Discounts to account for the time value of money, which were recorded as a reduction to electricity sales, amounted to \$12 million for the three months ended March 31, 2018. There were no discounts to account for the time value of money during the three months ended March 31, 2019. Discounts to account for the time value of money, which were recorded as a reduction to electricity sales, amounted to \$4 million and \$23 million for the six months ended March 31, 2019 and 2018, respectively.

Economic Development Incentives. Under certain economic development programs, TVA offers incentives to existing and potential power customers in certain business sectors that make multi-year commitments to invest in the Tennessee Valley. TVA records those incentives as reductions of revenue. Incentives recorded as a reduction to revenue were \$89 million and \$71 million during the three months ended March 31, 2019, and 2018, respectively. Incentives recorded as a reduction to revenue were \$156 million and \$136 million during the six months ended March 31, 2019, and 2018, respectively. Incentives that have been approved but have not been paid are recorded in Accounts payable and accrued liabilities and Other long-term liabilities in the Consolidated Balance Sheets. At March 31, 2019 and September 30, 2018, the outstanding unpaid incentives were \$154 million and \$145 million, respectively. These incentives may be subject to clawback provisions if the customers fail to meet certain program requirements.

## 17. Other Income (Expense), Net

Income and expenses not related to TVA's operating activities are summarized in the following table:

## Other Income (Expense), Net

	Three Months Ended March 31 2019		Six Months Ended March 31 2018	
Bellefonte deposit	\$—	\$—	\$21	\$—
Interest income	6	6	12	11
External services	2	4	6	8
Miscellaneous	—	1	—	1
Gains (losses) on investments	6	—	(1)	3
Total other income (expense), net	\$14	\$11	\$38	\$23

During the three months ended March 31, 2019, other income (expense), net increased \$3 million primarily driven by \$6 million of unrealized gains on the SERP and DCP investments during the quarter. During the six months ended March 31, 2019, other income (expense), net increased \$15 million primarily driven by \$21 million of other income related to a deposit liability received by TVA as a down payment on the sale of Bellefonte. The purchaser, Nuclear Development, LLC, failed to fulfill the requirements of the sales contract with respect to obtaining NRC approval of the transfer of required nuclear licenses and payment of the remainder of the selling price before the November 30, 2018, closing date.

## 18. Benefit Plans

TVA sponsors a qualified defined benefit plan ("pension plan") that covers most of its full-time employees hired before July 1, 2014, a qualified defined contribution plan ("401(k) plan") that covers most of its full-time employees,

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two unfunded post-retirement health care plans that provide for non-vested contributions toward the cost of eligible retirees' medical coverage, other post-employment 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.

Table of Contents

The components of net periodic benefit cost and other amounts recognized as changes in regulatory assets for the three and six months ended March 31, 2019 and 2018, were as follows:

Components of TVA's Benefit Plans<sup>(1)</sup>

	For the Three Months Ended March 31				For the Six Months Ended March 31			
	Pension Benefits		Other Post-Retirement Benefits		Pension Benefits		Other Post-Retirement Benefits	
	2019	2018	2019	2018	2019	2018	2019	2018
Service cost	\$10	\$13	\$ 3	\$ 3	\$22	\$27	\$ 6	\$ 7
Interest cost	126	119	5	4	249	237	9	9
Expected return on plan assets	(120)	(119)	—	—	(239 )	(239 )	—	—
Amortization of prior service credit	(24 )	(24 )	(6 )	(5 )	(49 )	(49 )	(12 )	(11 )
Recognized net actuarial loss	86	101	1	2	168	204	2	4
Total net periodic benefit cost as actuarially determined	78	90	3	4	151	180	5	9
Amount expensed (capitalized) due to actions of regulator	(2 )	(13 )	—	—	1	(27 )	—	—
Total net periodic benefit cost	\$76	\$77	\$ 3	\$ 4	\$152	\$153	\$ 5	\$ 9

Note

(1) The components of net benefit cost other than the service cost component are included in Other net periodic benefit cost in the Consolidated Statements of Operations.

TVA's minimum required pension plan contribution for 2019 is \$300 million. TVA contributes \$25 million per month to TVARS and as of March 31, 2019, had contributed \$150 million. The remaining \$150 million will be contributed by September 30, 2019. For the six months ended March 31, 2019, TVA also contributed \$44 million to the 401(k) plan and \$20 million (net of \$2 million in rebates) to the other post-retirement plans. TVA has contributed \$5 million to the SERP for the six months ended March 31, 2019, and expects to contribute an additional \$1 million in 2019.

## 19. Contingencies and Legal Proceedings

### 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 U.S. This protection consists of two layers of coverage:

The primary level is private insurance underwritten by American Nuclear Insurers ("ANI") and provides public liability insurance coverage of \$450 million for each operating reactor. If this amount is not sufficient to cover claims arising from an accident, the second level, Secondary Financial Protection, applies.

Within the Secondary Financial Protection level, the owner of each nuclear reactor has a contingent obligation to pay a retrospective premium, equal to its proportionate share of the loss in excess of the primary level, regardless of proximity to the incident of fault, up to a maximum of approximately \$138 million per reactor per incident. With TVA's seven reactors, the maximum total contingent obligation per incident is \$963 million. This retrospective premium is payable at a rate currently set at approximately \$20 million per year per incident per reactor. Currently, 99 reactors are participating in the Secondary Financial Protection program.

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In the event that a nuclear power plant event results in third-party damages, the primary level provided by ANI combined with the Secondary Financial Protection would provide approximately \$14.1 billion in coverage.

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 \$128 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 \$44 million.

Workers' Compensation. The Federal Employees' Compensation Act ("FECA") governs liability to TVA employees for service-connected injuries. TVA purchases insurance that compensates TVA for certain FECA costs. In addition, TVA sponsors an Owner Controlled Insurance Program ("OCIP") that provides workers' compensation and liability insurance for a select group

Table of Contents

of contractors performing maintenance, modifications, outage, and new construction activities at TVA facilities. The insurance and OCIP are subject to the terms and conditions of the relevant policies including deductibles and 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.

**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 11.

**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 March 31, 2019, the estimated future decommissioning cost of \$3.1 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 15 — Investment Funds. 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 various dates between 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.

**Non-Nuclear Decommissioning.** The estimated future non-nuclear decommissioning ARO was \$1.9 billion at March 31, 2019. 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 selected closure methodology, changes in available 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 15. 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.

**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.

TVA estimates that compliance with existing and future Clean Air Act ("CAA") requirements (excluding greenhouse gas ("GHG") requirements) could lead to costs of approximately \$153 million from 2019 to 2023, which include future clean air controls, existing controls capital projects, and air operations and maintenance projects. TVA also estimates additional expenditures of \$1.2 billion from 2019 to 2023 relating to TVA's CCR conversion program, not including costs related to any new requirements related to the Gallatin CCR facilities lawsuits, as well as expenditures of approximately \$313 million from 2019 to 2025 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, 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

## Table of Contents

some facilities have resulted in contamination that TVA is addressing. At March 31, 2019, and September 30, 2018, 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 \$16 million and \$12 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.

**Potential Liability Associated with Workers' Exposure to CCR Materials.** In response to the 2008 ash spill at Kingston, TVA hired Jacobs Engineering Group, Inc. ("Jacobs") to oversee certain aspects of the cleanup. After the cleanup was completed, Jacobs was sued in the United States District Court for the Eastern District of Tennessee ("Eastern District") by employees of a contractor involved in the cleanup and family members of some of the employees. The plaintiffs alleged that Jacobs had failed to take or provide proper health precautions and misled workers about the health risks associated with exposure to coal fly ash, which is a CCR material. The plaintiffs alleged that exposure to the fly ash caused a variety of significant health issues and illnesses, including in some cases death. The case was split into two phases, with the first phase considering, among other issues, general causation and the second determining specific causation and damages. On November 7, 2018, a jury hearing the first phase returned a verdict in favor of the plaintiffs, including determinations that Jacobs failed to adhere to its contract with TVA or the Site Wide Safety and Health Plan in place; Jacobs failed to provide reasonable care to the plaintiffs; and Jacobs's failures were capable of causing a list of medical conditions, ranging from hypertension to cancer. On January 11, 2019, the district court referred the parties to mediation. Depending on the outcome of mediation, the litigation will proceed to the second phase on the question of whether Jacobs's failures did in fact cause the plaintiffs' alleged injuries and damages. While TVA is not a party to this litigation, TVA could be contractually obligated to reimburse Jacobs for some amounts that Jacobs is required to pay as a result of this litigation. Further, TVA will continue monitoring this litigation to determine whether this or similar cases could have broader implications for the utility industry.

## 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 March 31, 2019, TVA had accrued \$14 million of probable losses with respect to Legal Proceedings. Of the accrued amount, \$12 million is included in Other long-term liabilities and \$2 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 Environmental Protection Agency ("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 sulfur dioxide ("SO<sub>2</sub>") and nitrogen oxide, (4) invest \$290 million in certain TVA environmental projects (of which TVA had spent approximately \$278 million as of March 31, 2019), (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 March 31, 2019, 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 March 31, 2019, Consolidated Balance Sheet and will be recovered in rates in future periods. TVA has substantially completed the requirements in the Environmental Agreements related to retiring coal-fired units or installing controls on such units.

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 9 — Background — Lawsuit Brought by TDEC and — Lawsuit Brought by TSRA and TCWN.

Consent Decree Involving Colbert Fossil Plant. In May 2013, the Alabama Department of Environmental Management ("ADEM") and TVA entered into a consent decree concerning alleged violations of the Alabama Water Pollution Control Act. The consent decree required, among other things, that TVA continue remediation efforts TVA had begun prior to the suit being filed and stop using an unlined landfill after a lined landfill is approved and constructed. TVA also paid \$150,000 to Alabama under this 2013 consent decree. In August 2018, the parties agreed to amend the consent decree to deal with groundwater issues

## Table of Contents

identified after TVA published groundwater monitoring reports in accordance with the EPA's CCR rule. The amended consent decree requires TVA to investigate the nature and extent of any groundwater contamination, develop and implement a remedy, provide semiannual status reports to ADEM, and remedy any seeps identified during inspections. TVA also paid \$100,000 to Alabama under the amended consent decree.

**Case Involving Tennessee River Boat Accident.** On July 23, 2015, plaintiffs filed suit in the United States District Court for the Northern District of Alabama, seeking recovery for personal injuries sustained when the plaintiffs' boat struck a TVA transmission line which was being raised from the Tennessee River during a repair operation. The district court dismissed the case, finding that TVA's exercise of its discretion as a governmental entity in deciding how to carry out the operation barred any liability for negligence. In August 2017, the United States Court of Appeals for the Eleventh Circuit ("Eleventh Circuit") affirmed the decision. The plaintiffs petitioned the U.S. Supreme Court ("Supreme Court") for review of the decision, arguing that the provision of the TVA Act which allows suit to be brought against TVA does not allow TVA to claim immunity for discretionary actions. The Supreme Court granted the plaintiffs' petition to review the case on September 27, 2018, and heard oral arguments on January 14, 2019. On April 29, 2019, the Supreme Court issued its opinion reversing the judgment of the Eleventh Circuit and remanding the case for further proceedings consistent with the opinion.

**Case Involving Bellefonte Nuclear Plant.** On November 30, 2018, Nuclear Development, LLC filed suit against TVA in the United States District Court for the Northern District of Alabama. The plaintiff alleges that TVA breached its agreement to sell Bellefonte to the plaintiff. The plaintiff seeks, among other things, (1) an injunction requiring TVA to maintain Bellefonte and the associated NRC permits until the case is concluded, (2) an order compelling TVA to complete the sale of Bellefonte to the plaintiff, and (3) if the court does not order TVA to complete the sale, monetary damages in excess of \$30 million. On December 26, 2018, Nuclear Development, LLC and TVA filed a joint stipulation with the court. Under the stipulation, Nuclear Development, LLC withdrew its request for an expedited hearing on its injunction in exchange for TVA's agreement to continue to maintain Bellefonte in accordance with the NRC permits and to give Nuclear Development, LLC and the court five days prior notice of any filing by TVA to terminate the permits or sell the site. TVA filed a motion to dismiss the case on February 4, 2019. A hearing on TVA's motion is scheduled for May 13, 2019.

## ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

(Dollars in millions except where noted)

Management's Discussion and Analysis of Financial Condition and Results of Operations ("MD&A") explains the results of operations and general financial condition of the Tennessee Valley Authority ("TVA"). The MD&A should be read in conjunction with the accompanying unaudited consolidated financial statements and TVA's Annual Report on Form 10-K for the fiscal year ended September 30, 2018 (the "Annual Report").

### Executive Overview

TVA's net income for the three and six months ended March 31, 2019, was \$241 million and \$664 million, respectively, as compared with net income of \$462 million and \$750 million for the same periods of the prior year. Despite record setting cold weather experienced in the month of November 2018, TVA's service territory experienced overall milder than normal weather during the six months ended March 31, 2019, driven by milder than normal weather during the months of January 2019 and February 2019. This milder weather drove lower energy sales. However, revenue from sales of electricity increased \$131 million for the six months ended March 31, 2019, as compared to the same period of the prior year primarily driven by the base rate adjustment that became effective October 1, 2018.

Fuel and purchased power expense increased \$31 million for the six months ended March 31, 2019, as compared to the same period of the prior year. This was primarily due to an increase in purchased power utilized to meet increased demand during the first quarter of 2019, partially offset by a significant increase in hydroelectric generation resulting from significant rainfall. Operating and maintenance expense increased \$267 million for the six months ended March 31, 2019, as compared to the same period of the prior year. This was primarily driven by accelerated recovery of the regulatory asset for Environmental cleanup costs related to the Kingston ash spill in accordance with the TVA Board's ratemaking authority, an increase in project write-offs and materials and supplies inventory reserves and write-offs associated with the anticipated retirement of Paradise Fossil Plant ("Paradise") and Bull Run Fossil Plant ("Bull Run"), and increased outage expense driven by additional planned nuclear outage days.

TVA remains committed to planning its system in a way that ensures evolving resource portfolios remain reliable and provide the most value to all customers. TVA utilizes an Integrated Resource Plan ("IRP") to provide direction on how to best meet future electricity demand. TVA continues to update the IRP, which will consider many views of the future to determine how TVA can continue to provide low-cost, reliable electricity, support environmental stewardship, and spur economic development in the Tennessee Valley over the next 20 years. TVA has also conducted economic analyses of its generating assets, considering load outlook, economic benefits and costs, performance, and environmental and social impacts. TVA also prepared Environmental Assessments ("EAs") pursuant to the National Environmental Policy Act ("NEPA") at certain plants, which are informing plans for future power supply.

Table of Contents

Additionally, during its August 2018 meeting, the TVA Board approved a plan to perform assessments of Bull Run and Paradise. These assessments included transmission resiliency, fuel security, financial considerations, and EAs. During its February 2019 meeting, the TVA Board approved the retirement of Paradise Unit 3 by December 2020 and Bull Run by December 2023. Subsequent to the Board approval, TVA determined Paradise would not be restarted after January 2020 due to the plant's material condition.

The Tennessee Valley experienced significant rainfall during the second quarter of 2019, setting a new record for the most rainfall in a month during the month of February 2019. Despite significant rainfall, runoff, and flooding during the second quarter of 2019, TVA continued to generate low-cost hydroelectric power while meeting its river system commitments, including flood mitigation which prevented approximately \$1.6 billion in damages across the Tennessee Valley.

During the second quarter of 2019, TVA completed power ascension testing on the second phase of the extended power uprate ("EPU") project at Browns Ferry Nuclear Plant ("Browns Ferry"). Physical work on the third and final phase was completed in April 2019. Power ascension testing is currently underway and is estimated to be completed in June 2019.

TVA continues to work with its local power company customers to provide flexibility to meet future changing needs of consumers. During its February 2019 meeting, the TVA Board approved a joint project with TVA's local power company customers ("LPCs") to explore options for aggregated procurement of utility-scale and mid-scale renewable generation. In addition, TVA issued a request for proposal in April 2019 for up to 200 MW of new renewable energy, aligning with customer demand.

TVA also continues to achieve 99.999 percent reliability in delivering energy to its customers. TVA's reliability and economic development efforts continued to attract and encourage the expansion of business and industries in the Tennessee Valley, with over \$6.3 billion in investments and more than 46,000 jobs created or retained through the second quarter of 2019.

Results of Operations

Sales of Electricity

The following charts compare TVA's sales of electricity for the three and six months ended March 31, 2019 and 2018:

Sales of Electricity  
Three Months Ended  
March 31  
(millions of kWh)

Sales of Electricity  
Six Months Ended  
March 31  
(millions of kWh)

Notes

(1) Includes approximately 411 million kilowatt hours ("kWh") of pre-commercial generation for the three months ended March 31, 2018. See Note 1 — Pre-Commercial Plant Operations.

(2) Includes approximately 431 million kWh of pre-commercial generation for the six months ended March 31, 2018. See Note 1 — Pre-Commercial Plant Operations.

Table of Contents

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 the TVA system 23-station average temperatures vary from 65 degrees Fahrenheit. During 2019, TVA transitioned degree day calculation methodologies, moving from the average temperatures of the five largest cities in TVA's service area to the average temperatures of 23 stations throughout TVA's service area. This transition provides TVA with increased geographic granularity throughout its service territory and improved modeling accuracy.

	Degree Days						Variation from Prior Period	
	Variation from Normal						Percent Change	
	2019 Actual	Normal	Percent Variation	2018 Actual <sup>(1)</sup>	Normal <sup>(1)</sup>	Percent Variation		
<b>Heating Degree Days</b>								
Three Months Ended March 31	1,696	1,870	(9.3 )%	1,774	1,870	(5.1 )%	(4.4 )%	
Six Months Ended March 31	3,080	3,159	(2.5 )%	3,089	3,159	(2.2 )%	(0.3 )%	
<b>Cooling Degree Days</b>								
Three Months Ended March 31	2	9	(77.8 )%	11	9	22.2 %	(81.8 )%	
Six Months Ended March 31	118	52	126.9 %	103	52	98.1 %	14.6 %	
<b>Total Degree Days</b>								
Three Months Ended March 31	1,698	1,879	(9.6 )%	1,785	1,879	(5.0 )%	(4.9 )%	
Six Months Ended March 31	3,198	3,211	(0.4 )%	3,192	3,211	(0.6 )%	0.2 %	

Note  
 (1) The prior period degree day information has been adjusted in order to incorporate a change in TVA's current calculation of this information. Every five years this calculation is updated in order to incorporate the current 15-year period of weather history. The most recent update, to incorporate weather history for CYs 2001-2015, occurred during the first quarter of 2019.

Sales of electricity decreased approximately four percent for the three months ended March 31, 2019, as compared to the same period of the prior year, primarily due to decreased sales volume for LPCs driven by a four percent decrease in heating degree days. TVA's service territory experienced milder than normal weather during the months of January 2019 and February 2019. Partially offsetting the decreased sales volume for LPCs, sales to industries directly served increased slightly, particularly in the polysilicon sector.

Sales of electricity decreased approximately one percent for the six months ended March 31, 2019, as compared to the same period of the prior year, primarily due to decreased sales volume for LPCs. Milder than normal weather during the months of January 2019 and February 2019 offset record-setting cold experienced during November 2018, where TVA recorded its second highest peak power demand for the month of November. Partially offsetting the decreased sales volume for LPCs, sales to industries directly served increased slightly, particularly in the polysilicon sector.

**Financial Results**

The following table compares operating results for the three and six months ended March 31, 2019 and 2018:  
 Summary Consolidated Statements of Operations

Three Months Ended		Six Months Ended	
March 31		March 31	
2019	2018	2019	2018

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			Percent Change			Percent Change
Operating revenues	\$2,750	\$2,792	(1.5 )%	\$5,475	\$5,341	2.5 %
Operating expenses	2,158	1,962	10.0 %	4,118	3,850	7.0 %
Operating income	592	830	(28.7)%	1,357	1,491	(9.0 )%
Other income, net	14	11	27.3 %	38	23	65.2 %
Other net periodic benefit cost	65	65	— %	129	128	0.8 %
Interest expense, net	300	314	(4.5 )%	602	636	(5.3 )%
Net income	\$241	\$462	(47.8)%	\$664	\$750	(11.5)%

48

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Table of Contents

Operating Revenues. Operating revenues for the three and six months ended March 31, 2019 and 2018, consisted of the following:

Operating Revenues

Three Months Ended

March 31

Operating Revenues

Six Months Ended

March 31

Notes

(1) Excludes a contra-revenue amount of approximately \$10 million representing revenue capitalized during pre-commercial operations for the three months ended March 31, 2018. See Note 1 — Pre-Commercial Plant Operations.

(2) Excludes a contra-revenue amount of approximately \$11 million representing revenue capitalized during pre-commercial operations for the six months ended March 31, 2018. See Note 1 — Pre-Commercial Plant Operations.

Table of Contents

TVA's current rate structure provides pricing signals intended to signal higher cost periods to serve its customers and capture a portion of TVA's fixed costs in fixed charges. The structure includes three base revenue components: time of use demand charges, time of use energy charges, and a grid access charge ("GAC"). The demand charges are based upon the customer's peak monthly usage and increases as the peak increases, and the energy charges are based on time differentiated kWh used by the customer. Both of these components can be significantly impacted by weather. The GAC, which was implemented in October 2018, captures a portion of fixed costs and will be offset by a corresponding reduction to the energy rates. The GAC will also reduce the impact of weather variability to the overall rate structure. Recognizing the need for flexibility, all LPCs were presented with the option to implement the GAC in October 2018 or defer the implementation until October 2019. Seventy-nine LPCs elected to implement in October 2018, while the remaining 75 have elected to implement wholesale changes in October 2019. In addition to base revenues, 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 payments to states and counties in lieu of taxes ("tax equivalents") associated with the fuel cost adjustments.

The changes in revenue components for the three and six months ended March 31, 2019, compared to the three and six months ended March 31, 2018, are summarized below:

Changes in Revenue Components

	Three Months Ended		Six Months Ended	
	March 31		March 31	
	2019	2018	2019	2018
		Change		Change
Base revenue				