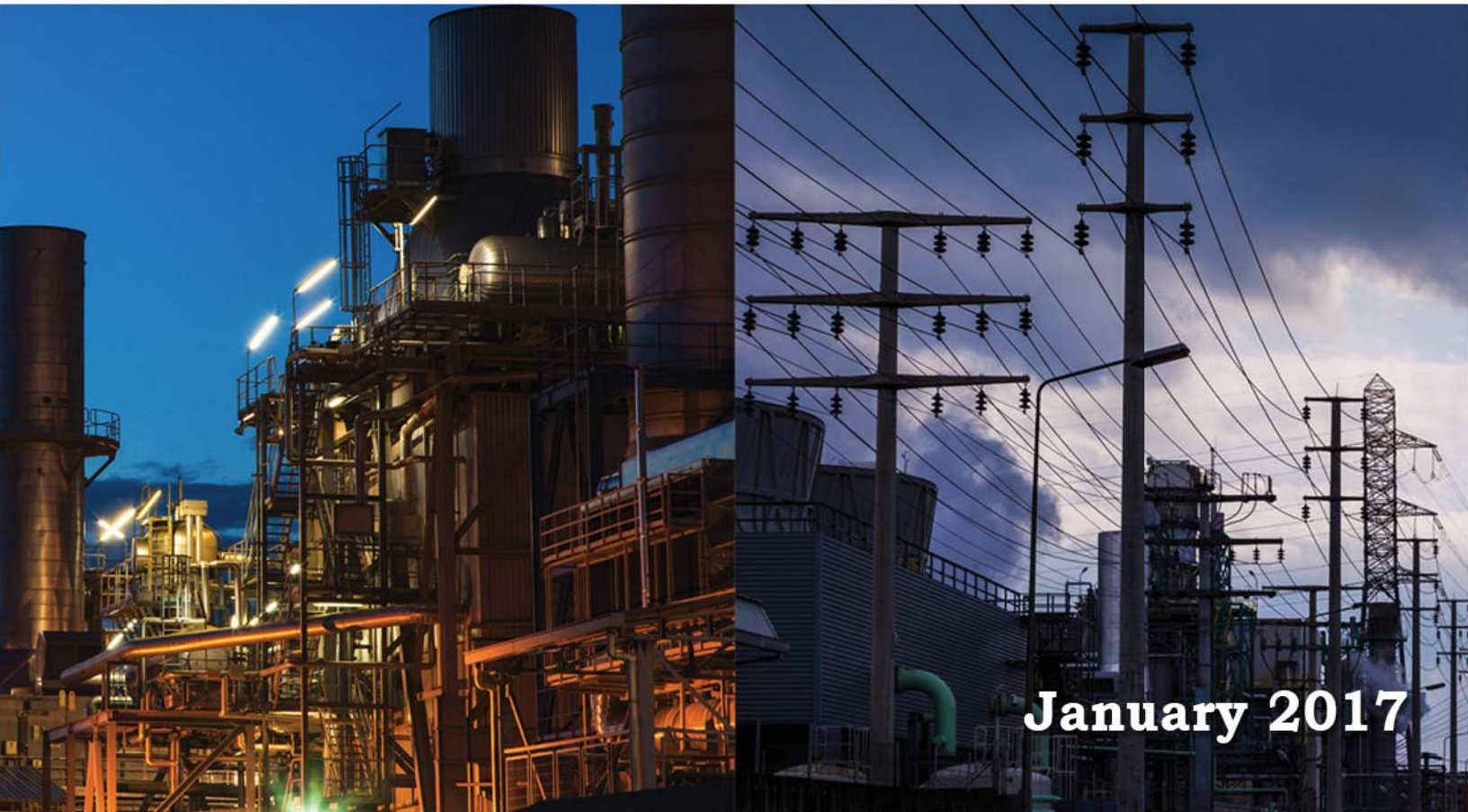
Report of the Tennessee Advisory Commission on Intergovernmental Relations

Tennessee Valley Authority's Payments in Lieu of Taxes

Annual Report to the Tennessee General Assembly



January 2017

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Report of the Tennessee Advisory Commission on Intergovernmental Relations

Tennessee Valley Authority's Payments in Lieu of Taxes

Annual Report to the Tennessee General Assembly

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January 26, 2017

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The Honorable Pat Marsh
Chair, House Business and Utilities Committee
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Dear Chairmen:

Transmitted herewith is the Commission's annual report evaluating the effect of Section 4 of Public Chapter 475, Acts of 2009, (the Electric Generation and Transmission Cooperative Act) as amended in Public Chapter 1035, Acts of 2010, on the Tennessee Valley Authority's payments in lieu of taxes with specific attention to changes in TVA's generating system. The report was approved January 26, 2017, and is hereby submitted for your consideration.

Respectfully yours,

Senator Mark Norris
Chairman

Cliff Lippard
Executive Director

The Tennessee Advisory Commission on Intergovernmental Relations

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MEMORANDUM

TO: Commission Members

FROM: Cliff Lippard
Executive Director

DATE: 26 January 2017

SUBJECT: Tennessee Valley Authority Payments in Lieu of Taxes–Annual Report for Approval

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The attached Commission report is submitted for your approval. The report responds to Public Chapter 475, Acts of 2009, which directed the Commission to monitor changes in the wholesale distribution of electric power by the Tennessee Valley Authority and its distributors for possible effects on the Authority's payments in lieu of taxes to the states in the Valley region and to Public Chapter 1035, Acts of 2010, which made the report an annual requirement. There are no recommended actions to be taken by the General Assembly in this year's report.

Contents

Tennessee Valley Authority's Payments in Lieu of Taxes 1

TVA's Payments in Lieu of Taxes Decline 3

TVA's Efforts to Meet Power Needs and Remain Within its Debt Limit 4

Short-Term System-Management Strategies 5

Long-Term System Management Strategies 5

TVA's Debt Limit and Financing Arrangements 6

Rebalancing Power Sources and Increasing Efficiency Could Affect PILOTs 9

The Shift Away from Coal: Environmental and Business Reasons 10

Fossil Plant Retirements for Business Reasons 12

New Environmental Regulations: EPA's Clean Power Plan 13

New Energy Sources to Meet the Region's Needs 13

References 17

Appendix A: Tennessee's Allocation Formula 21

Appendix B: Distribution of Counties' Share of TVA Payments in Lieu of Taxes to Tennessee by Tennessee Fiscal Year 23

Appendix C: Distribution of Cities' Share of TVA Payments in Lieu of Taxes to Tennessee by Tennessee Fiscal Year 25

Appendix D: TVA 2015 IRP Recommendations by Resource Type 31

Tennessee Valley Authority's Payments in Lieu of Taxes

The Tennessee Advisory Commission on Intergovernmental Relations was directed by the Electric Generation and Transmission Cooperative Act of 2009 (Section 4 of Public Chapter 475, Acts of 2009) to monitor changes in the wholesale distribution of electric power by the Tennessee Valley Authority (TVA) and its distributors for possible effects on the Authority's payments in lieu of taxes (PILOTs) to the states in the Valley region. The Commission's report was to "include recommendations, if any, on adjustments to the state tax system that would keep the state and local governments whole from such future changes." The Act authorized the creation of nonprofit membership cooperatives to generate and transmit electricity in Tennessee. At the time, one such co-op already owned a power-generating facility in Mississippi, and the legislature was concerned that, having authorized them, they had opened the door to a potential decline in TVA's payments to the states if the co-ops began selling electricity directly to distributors.

After considering a number of options, including those developed by the Commission,[1] the Tennessee General Assembly passed Public Chapter 1035, Acts of 2010, requiring payments equivalent to TVA's Tennessee PILOT from any other entity providing wholesale electric current for resale within the state, such as the electric generation and transmission cooperatives authorized in 2009. Public Chapter 1035 was designed to ensure that revenue from power sales in the TVA region would not depend on who produced that power or who sold it. The act also renewed the requirement that the Commission monitor the effects of the 2009 act and report to the General Assembly annually. This is the Commission's report for the 2017 legislative session.

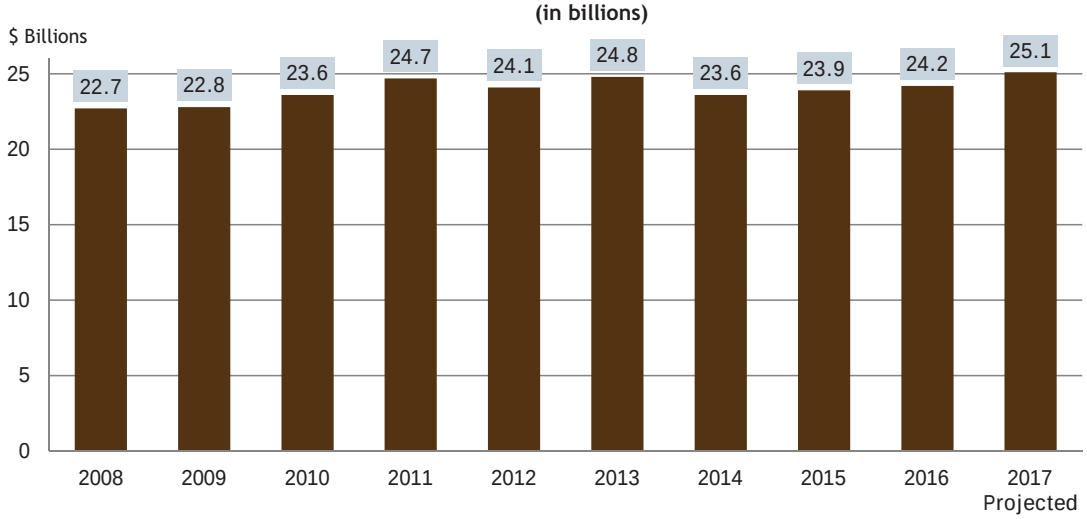
Although the 2010 law put to rest immediate concerns about the potential loss of TVA revenue created by the 2009 law, concerns about the problems created by the threat of privatization and by TVA's debt ceiling, which has not been raised since 1979,[2] continue to reappear from time to time. Both were among the reasons given by power distributors in the region for seeking authorization to form the generation and transmission co-operatives authorized by the 2009 Act. While the threat of privatization has diminished in recent years,[3] it is not known yet what, if any, new privatization policies the new federal administration might pursue. TVA's debt ceiling remains $30 billion, which because of inflation now has the buying power of about $11 billion.

TVA's payments in lieu of taxes to the eight states will decrease an estimated $18 million for federal fiscal year 2016-17 because of improved efficiencies within TVA and among its customers, relatively mild weather, and flat power demand.

[1] Tennessee Advisory Commission on Intergovernmental Relations 2010.
[2] 16 United States Code Section 831 n-4(a).
[3] Tennessee Valley Authority 2015h

In 2003, the US General Accounting Office (GAO) conducted a study of TVA's debt management strategies and concluded that TVA was in compliance with all applicable standards. But the GAO did say that Congress should consider amending the TVA Act to clarify whether the use of nontraditional financing arrangements such as lease-lease-back arrangements should be counted against the debt cap. Figure 1 shows the level of TVA's debt since 2008.[4]

Figure 1. Tennessee Valley Authority Statutory Debt at Year End (in billions)



Source: Tennessee Valley Authority 2014a; Tennessee Valley Authority 2015a; Tennessee Valley Authority 2016a; and email from Stephen Schoolfield, Program Manager-Taxes, Tennessee Valley Authority, October 20, 2016.

To manage within its $30 billion debt limit, TVA has adopted a number of innovative, but by its own account costly financing techniques, some of which can alter the amount of PILOT revenue paid directly to states. The lease-and-lease-back technique used so far to finance the expansion of power production in Tennessee does not affect the amount of the PILOT paid directly to Tennessee, but the sale-and-lease-back technique used at one of its plants in Mississippi reduced the amount paid directly to that state, and the potential for the same exists throughout the region. The difference is in who owns the property and whether it is subject to state and local taxes.

The management strategy laid out in TVA's 2015 Integrated Resource Plan (IRP) could also affect the balance of PILOTs across the region.[5] Changes in the supply system called for by the plan, brought about in part in response to economic factors and environmental mandates, include closing a number of old coal-fired generating plants, building or acquiring plants powered by natural gas, expanding nuclear-powered facilities, and relying more on renewable energy and energy efficiency. Demand management strategies

[4] United States General Accounting Office 2003.
[5] Tennessee Valley Authority 2015e.

in the plan, if successful, could reduce TVA revenues and ultimately the PILOT for all recipients.

Other changes may reduce TVA's PILOT to Tennessee as well. For example, six coal-fired units at the Johnsonville plant in Humphreys County were retired on December 31, 2015, and there are plans to retire the other four before December 2017.[6] This could reduce the value of power-producing property in Tennessee, one of two factors determining its share of the PILOT, unless the reduction is offset by an increase in the value of TVA property elsewhere in Tennessee or by net reductions in other states. Moreover, the demand management strategies in the Authority's plan, if successful, could reduce TVA revenues and ultimately the PILOT for all recipients, as could other factors, such as the economy and the weather. None of these changes appear to warrant legislative action at this time but should continue to be monitored.

Tennessee governments will receive an estimated $342.8 million in TVA PILOTs in federal fiscal year 2016-17.

TVA's Payments in Lieu of Taxes Decline

According to a press release issued in November 2016, TVA's actual payments in lieu of taxes for federal fiscal year 2015-16 amounted to $535 million, of which $351.8 million was paid to Tennessee governments, including $3.4 million[7] in direct payments to counties. This was a decrease of $7 million over payments to all states in the previous fiscal year. Payments for the current fiscal year, federal fiscal year 2016-17, are estimated to decrease by $18 million because of improved efficiencies within TVA and among its customers, relatively mild weather, and flat power demand.[8]

Tennessee governments will receive an estimated $342.8 million, of which $3.4 million will again be paid directly to counties. Table 1 approximates these payments; however, values in table 1 are reduced by 2% for consistency with past TVA estimates which allowed 2% for end of the year adjustments. Tennessee's percentage of the Authority's overall payments increased slightly, in part because TVA retired the last two coal-fired units at its Widows Creek facility, and five coal-fired units at Colbert, all located in Alabama, reducing that state's percentage of the PILOT relative to other states. Improvements to Watts Barr Unit 2, the Gallatin steam plant, Boone Dam, and the Allen combined-cycle plant increased the value of power-producing property in Tennessee, which offset decreases in value from the retirement of coal-fired units at Johnsonville.[9] Total payments are based

[6] Tennessee Valley Authority 2016c.
[7] Tennessee Valley Authority 2016h.
[8] Ibid.
[9] Email from Stephen Schoolfield, Program Manager-Taxes, Tennessee Valley Authority, December 8, 2016.

on five percent of prior-year gross proceeds[10] from power sales, and funds are divided among the eight states in which TVA owns power-producing properties based both on revenues from power sold by TVA and on the value of TVA power property located in each state. Although TVA buys power from other sources, those purchases have no effect on the amount each state receives from its PILOTs.

Tennessee receives more than 66% of the total distributed through this formula, a percentage that has been increasing steadily since 2008-09. Those increases helped offset what would have otherwise been larger decreases in TVA's payments to Tennessee in federal fiscal years 2016 and 2017. See table 1.

Table 1. Tennessee Valley Authority Revenue Sharing
Distribution Estimates by Federal Fiscal Year (in millions)*

		2016-17	2015-16	2014-15	2013-14	2012-13	2011-12
TVA Payment to States		$506.8	$524.2	$531.2	$522.4	$536.5	$567.4
Tennessee's Percent	X	66.56%	65.77%	65.30%	62.84%	61.69%	61.21%
Tennessee's Amount		$337.3	$344.8	$346.9	$328.3	$330.9	$347.3
Direct Payment to Counties	—	3.4	3.4	3.4	3.4	3.4	3.4
Tennessee's Share		$333.9	$341.4	$343.5	$324.9	$327.6	$343.9

*TVA estimates payments in lieu of taxes each year based on unaudited prior-year gross receipts, distributes these estimated payments monthly from October through August, then makes a final payment for the year in September based on audited revenue figures for the previous fiscal year. It is not unusual for the final payment to be adjusted upward from the original estimated amount. Tennessee's share minus payments to counties may not sum to the net to state because of rounding.

Source: Tennessee Valley Authority

Tennessee's local governments receive around 45% of the amount allocated to Tennessee, and they are directly affected by the decreasing total payments to Tennessee in federal fiscal year 2016-17. On a state fiscal year basis, the 2016-17 allocations will decrease by $1.9 million for counties, by $1.3 million for cities, and by $3 million for the state's own agencies. These amounts declined for the state fiscal year as well as for the federal fiscal year. See appendix A for an explanation of Tennessee's allocation formula and appendixes B and C for the distribution to local governments within the state by county and city since state fiscal year 2009-10.

TVA's Efforts to Meet Power Needs and Remain Within its Debt Limit

To meet the region's power demand, TVA must plan for both short-term and long-term fluctuations in the use of electricity while staying within its statutory debt limit of $30 billion. The Authority has developed a number of strategies for managing its system to meet demand within these constraints. These strategies have and will continue to affect TVA's payments to Tennessee.

[10] TVA interprets "gross proceeds" as the proceeds from the sale of power to municipalities, cooperatives, and industries. The TVA Act specifically excludes sales to federal agencies from the PILOT calculation.

Short-Term System-Management Strategies

TVA meets short-term-demand increases that result from extreme weather by operating additional facilities that are used only in times of high demand, purchasing power from other utilities, and cutting off power to customers with interruptible contracts. These strategies enabled TVA to meet record power demands on January 8, 2015, when demand hit the third highest winter peak in TVA's history at 32,723 megawatts[11] and again on February 19, 2015, when demand set a record for that month at 32,109 megawatts.[12] According to the Authority, "Meeting the demand required the combined effort of TVA's employees and generating facilities, coordination with the Valley's 155 local power companies and large industrial customers, and the cooperation of businesses and households to conserve."[13] TVA used natural gas plants to supplement the power provided by its coal-fired, nuclear, and hydroelectric facilities and purchased additional power from the open market to manage a similar period of peak demand in 2014.[14] But managing peak demand can require temporarily cutting off power to customers who agreed to allow TVA and its distributors to interrupt service to them during emergencies[15] in exchange for credits on their power bills[16] as happened at Murray State University in 2014.[17] Although extreme weather could affect the amount and distribution of TVA's payments to the states, these events were too short-lived to have a noticeable effect.

TVA must plan for both short-term and long-term fluctuations in the use of electricity while staying within its statutory debt limit of $30 billion.

Long-Term System Management Strategies

TVA's long-term management strategies are laid out in its updated Integrated Resource Plan, which was approved by the TVA Board in August 2015. The update, a response to changes in the utility industry including lower-cost natural gas and renewables as well as decreased demand caused by economic changes and energy efficiency efforts,[18] analyzed five strategies for meeting demand.

- Traditional utility approaches for optimizing cost
- Planning to meet demand while also meeting an emissions target
- Purchasing additional power from other utilities to meet most demand increases
- Maximizing energy efficiency
- Maximizing renewables[19]

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[11] Tennessee Valley Authority 2015b.
[12] Tennessee Valley Authority 2015g.
[13] Ibid.
[14] Tennessee Valley Authority 2014c.
[15] Flessner 2014.
[16] Tennessee Valley Authority 2011.
[17] Canning, Lampe, and Null 2014.
[18] Tennessee Valley Authority 2015i.
[19] Tennessee Valley Authority 2015e.

These strategies could affect the amount and distribution of the Authority's payments to the states in the future. TVA has been continually updating its generating system to meet the needs of the region's growing economy and tighter air-quality standards. As early as the 1960s and 1970s, TVA was investing heavily in nuclear power for both of these reasons. More recently, the Authority has invested in natural gas-powered facilities to meet periodic surges in demand caused by the weather. TVA's implementation of its long-term management strategies, which will affect the distribution of the Authority's PILOTs, will be affected by the economics of power production and the requirements of the Clean Air Act (CAA) and other environmental regulations as well as the Authority's debt limit.

The sale-and-lease-back technique used at one of TVA's plants in Mississippi reduced the amount paid to that state, and the potential exists throughout the region.

TVA's Debt Limit and Financing Arrangements

Earlier concerns about TVA's financing arrangements for new generating capacity in the region and their potential effects on PILOTs in the region and across the state have diminished as the Authority has modified its strategies. In order to stay within the $30 billion debt ceiling imposed on it by the Congress in 1979,[20] TVA began using new financing methods that affected the distribution of PILOT funds for some states, including the amount they had available to allocate to their counties and cities. One technique is the leasing of some generating facilities, an approach TVA has no current plans to expand.[21]

Shortly before the Electric Generation and Transmission Cooperative Act was passed in 2009, TVA entered into an agreement with a group of its distributors organized as the Seven States Power Corporation, a non-profit company.[22] Seven States purchased an interest in TVA's Southaven, Mississippi, power plant with the agreement that TVA would continue to operate it.[23] TVA later bought back all of Seven States' interest in the plant.[24] The source of power generation does not affect the PILOT; therefore, the sale-and-lease-back arrangement at Southaven did not affect PILOT because all sales were accounted for as TVA revenues and subject to the PILOT allocation to states.

Leasing arrangements such as the one used in Southaven during this agreement do not change the total amount of the PILOT under the TVA formula, nor do they change the allocation across states. Section 15d(g) of the Tennessee Valley Authority Act of 1933 says that

[20] 16 United States Code Section 831 n-4(a).
[21] For details on these arrangements see Tennessee Valley Authority 2014b.
[22] Tennessee Valley Authority 2009.
[23] More information about the plant can be found on TVA's website at https://www.tva.gov/Energy/Our-Power-System/Natural-Gas/Southaven-Combined-Cycle-Plant.
[24] Tennessee Valley Authority 2013a.

> *…power generating and related facilities operated by the Corporation under lease and lease-purchase agreements shall constitute power property held by the Corporation within the meaning of section 13 of this Act…*

This provision causes facilities qualifying for Section 15d(g) treatment to be included in the calculation of the value of power-producing property under Section 13, which means that the value of TVA property in the lease-holding state would be included in the PILOT calculation.

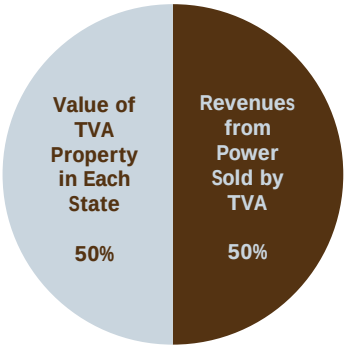
The amount of the TVA PILOT that goes through any particular state's allocation formula is decreased to the extent that TVA reimburses the new plant owners for taxes they must pay to the state or local governments. Section 15d(g) of the 1933 act goes on to say

> *…that portion of the payment due for any fiscal year under said section 13 to a state where such facilities are located which is determined or estimated by the Board to result from holding such facilities or selling electric energy generated thereby shall be reduced by the amount of any taxes or tax equivalents applicable to such fiscal year paid by the owners or others on account of said facilities to said state and to local taxing jurisdictions therein.*

The initial sale-and-lease-back arrangement at the Southaven plant and the Authority's current lease arrangement at the privately owned Caledonia plant, also in Mississippi, illustrate the effect of this second provision. Privately owned plants are, of course, subject to state and local taxes. Consequently, the portion of the TVA PILOT paid directly to Mississippi, related to Caledonia, was reduced by approximately $800 thousand in 2015-16 and will be reduced by an estimated $1 million in 2016-17.[25] This works much like the $3+ million in direct payments TVA makes to counties in Tennessee. Direct payments are taken off the top of TVA's PILOT to each state, reducing the amount allocated through the state's statutory formula.

The amount allocated through Tennessee's formula, including the amount retained by the state in its general fund, would be reduced by any taxes paid on account of any plant operated through a sale-and-lease-back arrangement if that were to occur. Tennessee might want to mitigate that reduction by modifying its allocation formula to offset the direct payments of taxes by, for example, reducing the allocation to any particular jurisdiction by the amount of the reimbursement TVA made to the plant owners. It is possible, of course, that the reimbursement amount to those jurisdictions could be greater than the allocation through the state

5% of TVA's Gross Proceeds is Distributed to States Based on



[25] Email from Stephen Schoolfield, Program Manager-Taxes, Tennessee Valley Authority, November 29, 2016.

formula, so considerable thought would need to go into making such a change.

The following statement included in TVA's 2013 Form 10-K filed with the United States Securities and Exchange Commission suggests that the sale-and-lease-back strategy has not been taken off the table:

> TVA may seek to enter into similar arrangements for other assets in the future, potentially including assets under construction. While such leasing transactions allow TVA to diversify its asset financing program, financing an asset by using the proceeds of leasing transactions is typically more costly to TVA than financing an asset with the proceeds of Bonds.[26]

TVA has no current plans for any sale-lease-back arrangements in Tennessee that would affect the state's share of the Authority's PILOT.

TVA chose a somewhat different strategy to raise funds for generating expansions in Tennessee without approaching its debt ceiling. Thus far, arrangements in Tennessee have been lease-and-lease-back agreements, which do not jeopardize the amount of the PILOT controlled by Tennessee's allocation formula. An example is the natural gas combined cycle plant built between 2010 and 2012 in Hawkins County next to the John Sevier fossil plant and leased to a private company in January 2012. The company paid TVA $1 billion for the lease and then leased the plant back to TVA for 30 years.[27] This lease arrangement changes neither the ownership of the property nor TVA revenues and thus has no effect on the PILOT across states or within Tennessee. Similarly, in August 2013, TVA repurchased the 90% share of the Southaven plant that Seven States had purchased. TVA then entered into a leasing arrangement with Southaven Combined Cycle Generation LLC in which the facility is leased to the company and, in turn, the facility is leased back to TVA.[28]

Currently, TVA has no plans for any sale-lease-back arrangements in Tennessee that would affect the state's share of the Authority's PILOT in the short-term.[29] However, the possibility exists that TVA could utilize this strategy in the future to finance new construction if its debt limit remains capped at $30 billion. TVA's 2014 Form 10-K acknowledges its use of these innovative financing techniques but mentions no plans for additional arrangements at the present time. TVA may seek to enter into similar arrangements in the future, but has no immediate plans to do so.[30]

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[26] Tennessee Valley Authority 2013a.
[27] More information about the plant can be found on TVA's website at https://www.tva.com/Energy/Our-Power-System/Natural-Gas/John-Sevier-Combined-Cycle-Plant and in Tennessee Valley Authority 2013a.
[28] Tennessee Valley Authority 2013c.
[29] Telephone interview with Stephen Schoolfield, Program Manager-Taxes, Tennessee Valley Authority, November 29, 2016.
[30] Tennessee Valley Authority 2014b.

In April 2015, TVA purchased Quantum Utility Generation's Choctaw combined-cycle natural gas plant near Ackerman, Mississippi. Although the purchase used traditional forms of financing, the acquisition allows for future ownership by Seven States Power Corporation, which could affect the PILOT depending on the type of sale or lease arrangement adopted.[31]

Rebalancing Power Sources and Increasing Efficiency Could Affect PILOTs

As TVA continues to rebalance its generation fleet consistent with the recommendations in its 2015 IRP, these changes could cause shifts in the value of power-producing property from state to state and from county to county and change each state and county's share of TVA's PILOTs. Some of the changes so far, including the changes at the John Sevier plant in Hawkins County, which were part of a set of agreements to settle a series of legal challenges, have occurred mostly at existing sites and have not had an adverse effect on the PILOT because retired coal-fired units were replaced with natural gas units. Similar changes are underway at plants in Memphis and Muhlenberg County, Kentucky. Other changes, however, could cause a shift in payments. For example, the completion of the second unit at the Watts Bar nuclear plant in Rhea County increases Tennessee's share of the PILOTs to the extent that it increases the value of the Watts Bar property, [32] but, the upcoming elimination of all of the coal-fired units at the Johnsonville plant in Humphreys County could decrease Tennessee's share. The retirement of coal-fired units in Alabama and Kentucky in the last three years could also affect the distribution of payments across states.[33] Because retired units are no longer used to produce power, TVA accelerates their depreciation so that only their residual value is included in the PILOT distribution formula.[34]

TVA continues to rebalance its generation fleet, which could cause shifts in the value of power-producing property from state to state in each state's share of TVA's PILOT.

On November 14, 2016, TVA announced the sale of the Bellefonte property near Hollywood, Alabama. The Bellefonte facility was never operational while owned by TVA; however, the value of this property did count toward Alabama's PILOT, so the sale of Bellefonte will decrease Alabama's share of the PILOT in the future.[35]

[31] Tennessee Valley Authority 2015f.
[32] Email from Stephen Schoolfield, Program Manager-Taxes, Tennessee Valley Authority, December 8, 2016.
[33] Tennessee Valley Authority 2013b.
[34] Email from Stephen Schoolfield, Program Manager-Taxes, Tennessee Valley Authority, January 6, 2016.
[35] Tennessee Valley Authority 2016g; Telephone interview with Stephen Schoolfield, Program Manager-Taxes, Tennessee Valley Authority, November 29, 2016.

The 2015 IRP calls for energy efficiency savings of between 900 and 1,300 megawatts by 2023 and between 2,000 and 2,800 megawatts by 2033.[36] Some of that improved efficiency will occur through upgrading power transmission and distribution systems; some will occur in private homes and businesses. As customers update their homes, commercial and industrial facilities, and electrical appliances and equipment, those changes reduce existing power demand, which could reduce TVA revenues and ultimately the PILOT for all recipients if demand does not continue to grow with the population and the economy.

The Shift Away from Coal: Environmental and Business Reasons

TVA is gradually moving from coal to other power sources because of the age of its coal-fired plants and changing air quality requirements.

Since the 1950s, coal-fired plants have been TVA's largest single source of power, but because of their age and changing air quality requirements, the Authority is shifting emphasis from coal to other power sources (see figure 2 from the 2015 IRP). As the Authority's coal-fired power plants age, TVA must either retire them or install costly upgrades to meet new air-quality standards that tighten restrictions on the emission of particulates, sulfur dioxide, nitrogen oxides, mercury, lead, and carbon—the major byproducts of burning coal. To resolve a series of legal challenges brought under the Clean Air Act by several states, including Tennessee, and environmental groups, TVA entered into two settlement agreements in April 2011:

> The first agreement is a Federal Facilities Compliance Agreement with the Environmental Protection Agency. The second agreement is with Alabama, Kentucky, North Carolina, Tennessee, and three environmental advocacy groups: the Sierra Club, National Parks Conservation Association, and Our Children's Earth Foundation. Under the Environmental Agreements, TVA agreed to retire 18 of its 59 coal-fired units by the end of 2017.[37]

Because the cost of upgrading existing coal-fired facilities, the relative cleanliness of other fuels, and the decreasing cost of natural gas that have resulted in a competitive advantage for other methods of generating electricity, the Authority has retired 24 coal-fired units since 2012 and will retire an additional 9 in the coming years.[38]

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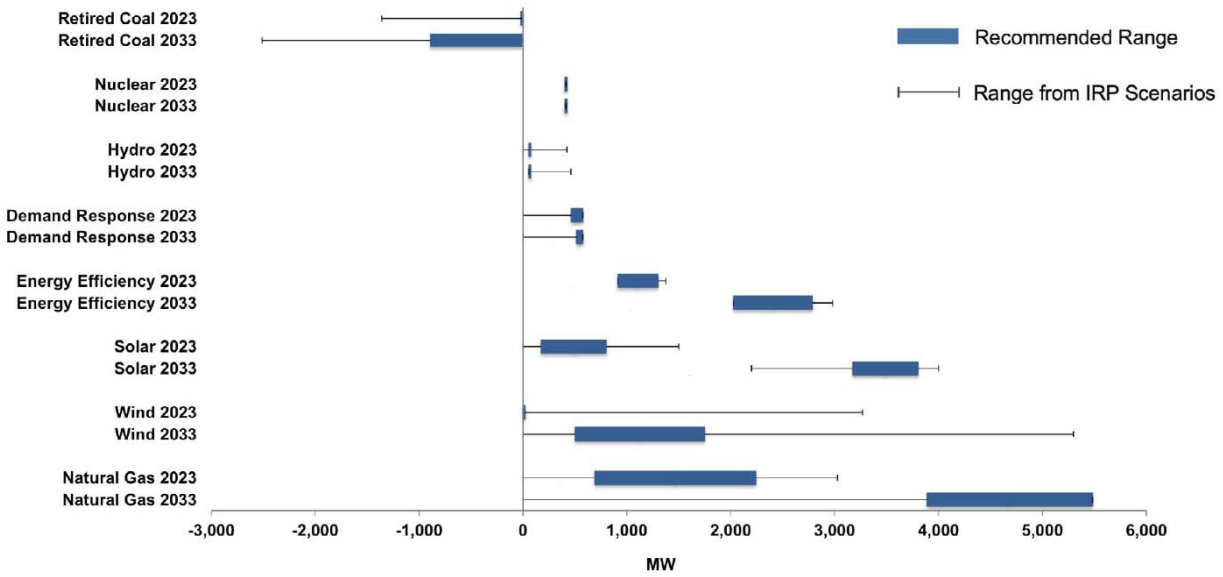
[36] Tennessee Valley Authority 2015e. By way of comparison, TVA's newest combined-cycle natural gas plant in Ackerman, Mississippi is capable of producing 700 megawatts of electricity. (https://www.tva.gov/Energy/Our-Power-System/Natural-Gas/Ackerman-Combined-Cycle-Plant).
[37] Tennessee Valley Authority 2016c.
[38] Ibid.

Figure 2. TVA Capacity Changes in Megawatts by 2023 and 2033



Source: Tennessee Valley Authority 2015d.

Fossil Plant Retirements Required by Environmental Agreements

As a result of the settlement agreements, TVA has already retired 14 of 59 coal-fired units and will retire the remaining four coal-fired units at the Johnsonville Fossil plant before 2018. Those already retired include two of four coal-fired units at its John Sevier plant in Hawkins County, which as noted above were replaced by a combined-cycle gas plant on an adjacent site, six coal-fired units at its Johnsonville plant in Humphreys County, and six of eight units at the Widows Creek Fossil Plant in Alabama.[39] See table 2.

Table 2. Tennessee Valley Authority Coal-Fired Units to be Retired Under Environmental Agreements

Fossil Plant	Total Units	Existing Scrubbers and SCRs*	Requirements Under Environmental Agreements	Retirements Implemented or Planned to be Implemented by TVA as a Result of Environmental Agreements
John Sevier	2	None	• Retire two units no later than December 31, 2012	• Retired Units 1 and 2 on December 31, 2012
Johnsonville	10	None	• Retire six units no later than December 31, 2015 • Retire four units no later than December 31, 2017	• Retire Units 5-10 by December 31, 2015 • Retire Units 1-4 by December 31, 2017
Widows Creek	6	Scrubbers and SCRs on Units 7 and 8	• Retire two of Units 1-6 no later than July 31, 2013 • Retire two of Units 1-6 no later than July 31, 2014 • Retire two of Units 1-6 no later than July 31, 2015	• Retired Units 3 and 5 on July 31, 2013 • Retired Units 1, 2, 4, and 6 on July 31, 2014

* Selective catalytic reduction systems ("SCR")

Source: Tennessee Valley Authority 2014b; Tennessee Valley Authority 2015d; and Tennessee Valley Authority 2016c.

[39] Ibid.

Fossil Plant Retirements for Business Reasons

Because of the competitive advantage over coal of other methods of generating electricity, TVA has already retired the two coal-fired units at the John Sevier Fossil Plant and one of the ten units at the Shawnee Fossil Plant in Kentucky. The Authority decided to add pollution control devices to two of the remaining coal- fired units at Shawnee rather than retire them. It retired the last two units at the Widows Creek Fossil Plant in Alabama in 2015 and sold the property.[40] The Authority will retire all three units at the Allen Fossil Plant in Memphis and replace them with gas-fired units on the same site by September 2018. Similarly, TVA plans to close two of three coal-fired units at the Paradise Fossil Plant in Kentucky and replace them with gas-fired units on the same site. The Authority also retired all five coal-fired units at its Colbert plant in Alabama in April 2016.[41] See table 3.

Table 3. Actions to be Taken at Tennessee Valley Authority Coal-Fired Units for Business Reasons

Fossil Plant	Units Affected	Existing Scrubbers and SCRs	Requirements Under Environmental Agreements	Other Actions Taken or Planned
Allen	3	SCRs on all three units	• Install scrubbers or retire no later than December 31, 2018.	• The Board approved the construction of a gas-fired plant at the current location of the Allen coal-fired site. • Retire Units 1-3 after completion of the gas fired plant before December 31, 2018.
Bull Run	1	Scrubber and SCRs on unit	• Continuously operate current and any new emission control equipment.	• Continuously operate existing emission control equipment.
Colbert	5	SCR on Unit 5	• Remove from service, control, convert, or retire Units 1-4 no later than June 30, 2016. • Remove from service, control, or retire Unit 5 no later than December 31, 2015. • Control or retire removed from service units within three years.	• Retired Units 1-5 on April 16, 2016
Cumberland	2	Scrubbers and SCRs on both units	• Continuously operate existing emission control equipment.	• Continuously operate existing emission control equipment.
Gallatin	4	None	• Control, convert, or retire all four units no later than December 31, 2017.	• Add scrubbers and SCRs on all four units by December 31, 2017.
John Sevier	2	None	• Remove from service two units no later than December 31, 2012 and control, convert, or retire those units no later than December 31, 2015.	• Retired Units 3 and 4 on June 25, 2014.
Kingston	9	Scrubbers and SCRs on all nine units	• Continuously operate existing emission control equipment	• Continuously operate existing emission control equipment
Paradise	3	Scrubbers and SCRs on all three units	• Upgrade scrubbers on Units 1 and 2 no later than December 31, 2012. • Continuously operate emission control equipment on Units 1-3.	• The Board approved the construction of a gas-fired plant at the current location of the Paradise coal-fired plant. • Upgraded scrubbers on Units 1 and 2 • Retire Units 1 and 2 after completion of the gas-fired plant by September 30, 2017 • Continuously operate existing emission control equipment on Unit 3
Shawnee	10	None	• Control, convert, or retire Units 1 and 4 no later than December 31, 2017.	• Retired Unit 10 on June 30, 2014. • Add scrubbers and SCRs on Units 1 and 4 by December 31, 2017.
Widows Creek	2	Scrubbers and SCRs on Units 7 and 8	• Continuously operate existing emissions control equipment on Units 7 and 8.	• Retired Units 7 and 8 on September 30, 2015.

Note: Selective catalytic reduction systems ("SCR")
Source: Tennessee Valley Authority 2014b; Tennessee Valley Authority 2015d; and Tennessee Valley Authority 2016c.

[40] Telephone interview with Neil Placer, Senior Manager, Renewable Energy Solutions, TVA, February 20, 2015.
[41] Tennessee Valley Authority 2016c.

New Environmental Regulations: EPA's Clean Power Plan

In its Clean Power Plan (CPP), finalized in August 2015, the US Environmental Protection Agency (EPA) set carbon-pollution reduction goals for each state. The CPP rule establishes interim and final carbon dioxide (CO2) emission performance rates for two subcategories of fossil fuel-fired electric generating units (EGUs): fossil fuel-fired electric steam generating units (generally, coal- and oil-fired power plants) and natural gas-fired combined cycle generating units. The rule requires states to develop and implement plans that ensure the power plants in their state—either individually, together, or in combination with other measures—achieve the equivalent in terms of either rate or mass of the interim CO2 performance rates between 2022 and 2029, and the final CO2 emission performance rates by 2030. It allows each state to select the measures it prefers and "to shape their emissions reduction pathways over the 2022-29 period."

The rule would have required states to submit a final plan or an initial submittal with an extension request by September 6, 2016, and a complete state plan no later than September 6, 2018.[42] But in October 2015, West Virginia et al. sued the EPA to block the CPP requirements. In February 2016, the US Supreme Court granted a request to freeze implementation of the CPP during the litigation process. The US Court of Appeals for the DC Circuit is expected to issue a decision by early 2017. Regardless of the outcome, the losing side is likely to appeal to the US Supreme Court. Because of the litigation, the EPA said it did not expect states to comply with the September 6, 2016, deadline to submit an implementation plan.[43]

If the CPP becomes effective, then complying with it may result in further shifts away from coal-fired power in TVA's generating network. However, it is too early to tell whether the Authority will have to retire coal-fired units in addition to those already scheduled to be retired for environmental or business reasons. According to TVA, "The impact of these rules on TVA and the states in TVA's service territory cannot be determined until the state plans are developed and approved by the EPA, but the impact on TVA could be significant."[44]

"We will look at [the EPA's Clean Power Plan] final rule more specifically to understand how the Integrated Resource Plan (IRP) can inform TVA's compliance plans but feel the study recommendations point us in a direction to meet whatever requirements are included in that rule."

Tennessee Valley Authority
2015 Integrated Resource Plan

New Energy Sources to Meet the Region's Needs

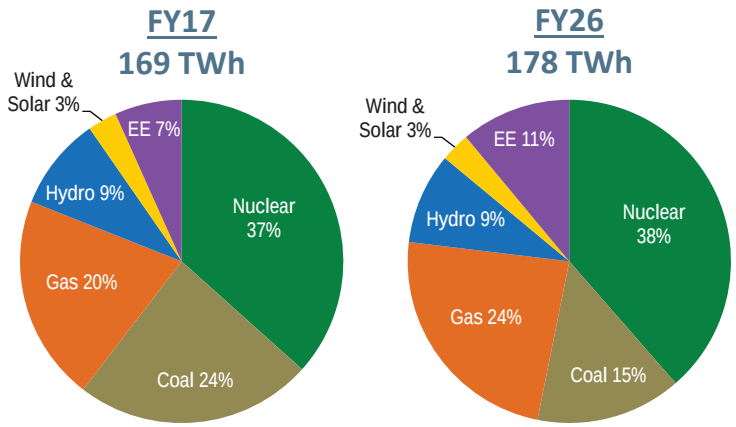
As TVA retires existing coal-fired units, new energy sources are being developed to meet the region's electricity needs, including natural gas, solar, wind, and nuclear options. TVA is implementing energy efficiency (EE)

[42] US Environmental Protection Agency 2015.
[43] Email from Kendra Abkowitz, Director of Policy and Planning, Tennessee Department of Environment and Conservation, October 25, 2016.
[44] Tennessee Valley Authority 2015d.

initiatives as well. The second nuclear reactor at Watts Bar Nuclear Plant in Rhea County became commercially operational on October 19, 2016.[45] Figure 3 shows the current and future balance of TVA's power generating sources and the shift to more energy efficiency.

Natural gas and nuclear power, along with energy efficiency strategies, are expected to play a growing role in the region's energy future.

Figure 3. TVA's Power Generating Sources



Note: A terawatt hour (TWh) is equal to a sustained power of approximately 114 megawatts for a period of one year.

Source: "Fiscal Year 2016 Conference Call." TVA Investor Relations, November 15, 2016, accessed December 13, 2016, http://www.snl.com/Cache/1500093347.PDF?O=PDF&T=&Y=&D=&FID=1500093347&iid=

As noted in past reports, TVA continues to modify its renewable energy programs within the changing market for renewables such as wind, solar, and hydroelectric power. TVA will continue to rebalance its power generating system to meet demand. These programs have no effect on TVA's gross revenues, nor do they affect power sales in any state, and so have little to no effect on PILOTs to the several states. Participants continue to buy power from their local power companies and sell all of the power they generate through a system called dual metering to TVA. Their only potential effect would be the extent to which they reduce the Authority's acquisition of new power-producing property in any particular state.

As it implements its new IRP, TVA is making substantial changes in these incentive programs. The Authority has said in the past that,

> as renewable energy system costs continue to decrease and become more affordable, there is less need for subsidies for small-scale renewable generation. TVA wants to promote sustainable growth in small-scale renewable generation while continuing to support local industry and provide a smooth path to grid parity.[46]

[45] Tennessee Valley Authority 2016i.
[46] Tennessee Valley Authority "Green Power Providers: Frequently Asked Questions."

TVA has been encouraging the private sector to develop small and medium renewable energy projects by buying electricity from participants in two major programs. Small projects are those with a capacity of 50 kilowatts or less;[47] medium-sized projects are those with a capacity of more than 50 kilowatts but no more than 20 megawatts.[48] A 50-kilowatt solar installation can provide enough power for approximately five average-sized homes in Tennessee.[49] The Green Power Providers program buys power from homeowners and businesses who install small renewable energy projects, including solar, wind, biomass, and hydro.[50] The Green Power Providers program will continue adding new projects in 2017.[51] The Renewable Standard Offer (RSO) program buys power from owners of medium-sized solar, wind, biomass, or methane projects.[52] The RSO offering was sunset in 2015, but the program remains open to projects that have existing capacity allocations and are in the process of being completed.[53]

The Dispersed Power Production program, which replaces the RSO program, is open to both residential and non-residential customers. It allows customers to connect solar, wind, hydroelectric, biomass, waste, or geothermal generation systems to TVA power lines so that any unused power may be sold to TVA. These generation systems are limited to a gross output of 50 kilowatts or less, but in 2016 Distributed Solar Solutions was created as a pilot program to encourage projects that are directed by local power companies and that have individual capacities greater than 50 kilowatts but no more than five megawatts.[54]

TVA has controlled the cost of its renewable energy programs by limiting participation and capacity and by reducing subsidies over time. The Authority limited the RSO to 100 megawatts of new capacity per year from 2011 when it began through 2015;[55] it increased its annual limit on the Solar Solutions Initiative to 20 megawatts of new capacity in 2015 up from 10 megawatts when the program began in 2012;[56] and it limited its new Distributed Solar Solutions program to a total of 10 megawatts in 2016.[57] The Authority has limited Green Power Providers to 10 megawatts of new capacity per year since it first placed a cap on the program in 2012.[58] The

TVA has controlled the cost of its renewable energy programs by limiting participation and capacity and by reducing subsidies over time.

[47] Tennessee Valley Authority "Green Power Providers Program Participation Guidelines (2016)."
[48] Tennessee Valley Authority "Guidelines for Renewable Standard Offer."
[49] Email from Grace Robertson, Marketing Manager, Lightwave Solar, February 23, 2015.
[50] Tennessee Valley Authority "Green Power Providers Program Participation Guidelines (2016)."
[51] Tennessee Valley Authority "Green Power Providers."
[52] Tennessee Valley Authority "Guidelines for Renewable Standard Offer."
[53] Tennessee Valley Authority 2016c.
[54] Tennessee Valley Authority "Guidelines for Distributed Solar Solutions."
[55] Tennessee Valley Authority "Guidelines for Renewable Standard Offer."
[56] Tennessee Valley Authority "Solar Solutions Initiative: Frequently Asked Questions."
[57] Tennessee Valley Authority "Guidelines for Distributed Solar Solutions."
[58] Telephone interview with Neil Placer, Senior Manager, Renewable Energy Solutions, TVA, February 20, 2015.

program's total allocation of 10 megawatts will be split equally between residential and non-residential customers in 2016.[59]

TVA pays RSO participants a base rate that varies seasonally and with time of day from less than three cents per kilowatt-hour to more than five cents per kilowatt-hour.[60] Within the RSO program, participants who generate no more than one megawatt of solar power may earn a premium of four cents per kilowatt-hour through the Solar Solutions Initiative,[61] down from eight cents when the program began in 2012.[62] Similar to its RSO participants, the Authority pays participants in its Distributed Solar Solutions program a base rate that varies seasonally and with time of day from less than four cents per kilowatt-hour to almost seven cents per kilowatt-hour.[63] It will no longer pay new residential Green Power Providers a premium above the retail rate,[64] which had already declined to two cents per kilowatt-hour[65] from its original twelve cents in 2012.[66]

According to TVA's October 2015 report on efforts to develop a method for assessing the benefits and costs associated with various forms of distributed power-generation like the ones supported by these programs, the average value for solar generation for TVA is just over seven cents per kilowatt-hour, which is less than the average retail rate charged in 2015.[67] In order to develop the method, TVA assembled a cross-section of participants from the Tennessee Valley region, including local power companies, the Tennessee Valley Public Power Association, various environmentally focused non-governmental entities, solar industry representatives, academia, state governments, and national research institutions. Response to the report has been mixed. Among participants who were critical of the report, while generally complimentary of the process and the effort, the Southern Environmental Law Center said the analysis did not properly consider solar power's environmental and health benefits,[68] and the Southern Alliance for Clean Energy, agreeing with that assessment, expressed concern that TVA already "lags behind neighboring states like Georgia and North Carolina in developing a strong solar market."[69] But others urged TVA to pursue the least cost source of power to keep its electric rates as low and competitive as possible.[70]

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[59] Tennessee Valley Authority "Green Power Providers."
[60] Tennessee Valley Authority "Renewable Standard Offer Contract."
[61] Tennessee Valley Authority "Solar Solutions Initiative: Frequently Asked Questions."
[62] Roy 2013.
[63] Tennessee Valley Authority "Distributed Solar Solutions Contract."
[64] Tennessee Valley Authority "Green Power Providers Program Participation Guidelines (2016)."
[65] Tennessee Valley Authority "Green Power Providers Program Participation Guidelines (2015)."
[66] Coggeshall 2013.
[67] Flessner 2015; and Tennessee Valley Authority 2015c.
[68] Southern Environmental Law Center 2015.
[69] Nelson 2015.
[70] Flessner 2015.

References

Canning, Rob, Chad Lampe, and John Null. 2014. "Damage to at Least 40% of MSU's Main Buildings Due to Power Outage and Freezing Temps." WKMS, January 7. http://wkms.org/post/damage-least-40-msus- main-buildings-due-power-outage-and-freezing-temps.

Coggeshall, Charlie. 2013. "TVA Continues to Mismanage Solar." Footprints on the Path to Clean Energy (blog), Southern Alliance for Clean Energy, May 10. http://blog.cleanenergy.org/2013/05/10/tva-continues-to-mismanage-solar-power/.

Flessner, Dave. 2014. "'Arctic Blast' Pushes TVA Power Use to All-Time High." *Chattanooga Times Free Press*, January 8. http://www.timesfreepress.com/news/business/aroundregion/story/2014/jan/08/arctic-blast-pushes-tva-power-use-all-time-high/128523/.

———. 2015. "Study find value of solar power less than what TVA pays." Chattanooga Times-Free Press, October 21. http://www.timesfreepress.com/news/business/aroundregion/story/2015/oct/21/study-find-value-solar-power-less-whtvpays/331624/.

Nelson, Toni. 2015. "TVA Undermines Distributed Solar and Disregards Its Own Stakeholder Process." Footprints on the Path to Clean Energy (blog), Southern Alliance for Clean Energy, November 11. http://blog.cleanenergy.org/2015/11/11/tva-undermines-distributed-solar-and-disregards-its-own-stakeholder-process/.

Roy, Asa. 2013. PV Solar Resource Guide for Rural Distributors in TN. http://cire.utk.edu/files/Roy,%20 Asa%20-%20Solar%20Resources%20in%20Rural%20TN.pdf.

Southern Environmental Law Center. 2015. "New TVA analysis takes first step toward recognizing the value of solar." News release, October 20. https://www.southernenvironment.org/news-and-press/news-feed/new-tva-analysis-takes-first-step-toward-recognizing-the-value-of-solar.

Tennessee Advisory Commission on Intergovernmental Relations. 2010. *The Electric Generation and Transmission Cooperative Act of 2009 and Its Possible Impact on the Tennessee Valley Authority's Payments in Lieu of Taxes*. https://www.tn.gov/assets/entities/tacir/attachments/electric_generation_cooperative_act.pdf.

Tennessee Valley Authority. 2009. *Form 10-Q*.

———. 2011. *Environmental Impact Statement for TVA's Integrated Resource Plan: TVA's Environmental & Energy Future, Volume 1*.

———. 2013a. *Form 10-K*.

———. 2013b. "TVA Board Takes Action to Improve TVA's Operations and Financial Health." News release, November 14. http://www.tva.com/news/releases/octdec13/board_111413.html.

———. 2013c. "TVA Secures Lease-Purchase Financing for Mississippi Gas Plant." News release, August 9. http://www.tva.com/news/releases/julsep13/miss_gas_plant.htm.

———. 2014a. *Budget Proposal and Management Agenda: For the Fiscal Year Ending September 30, 2015*. https://www.tva.com/file_source/TVA/Site%20Content/About%20TVA/Guidelines%20and%20Reports/budget_proposal_2015.pdf.

———. 2014b. *Form 10-K*.

———. 2014c. "TVA System Meets Single-Day Electricity Record." News release, January 8. https://www.tva.gov/Newsroom/Press-Releases/TVA-System-Meets-SingleDay-Electricity-Record.

———. 2015a. Budget Proposal and Management Agenda: *For the Fiscal Year Ending September* 30, 2016. https:// www.tva.com/file_source/TVA/Site%20Content/About%20TVA/Guidelines%20and%20 Reports/ FY16%20Blue%20Book%20-%20Final.pdf.

———. 2015b. "Conservation, Preparation Key to Meeting High Electric Power Demand." News release, January 8. https://www.tva.com/Newsroom/Press-Releases/Conservation,-Preparation-Key-to-Meeting-High-Electric-Power-Demand.

———. 2015c. Distributed Generation—Integrated Value (DG-IV): A Methodology to Value DG on the Grid. https:// www.tva.gov/file_source/TVA/Site%20Content/Energy/Renewables/dgiv_document_october_2015-2. pdf.

———. 2015d. Form 10-K.

———. 2015e. Integrated Resource Plan.

———. 2015f. "TVA Completes Purchase of Mississippi Natural Gas Plant." News release, April 14. https://www.tva.com/Newsroom/Press-Releases/TVA-Completes-Purchase-of-Mississippi-Natural-Gas-Plant.

———. 2015g. "TVA Meets February Record Peak Demand." News release, February 19. https://www.tva.gov/ Newsroom/Press-Releases/TVA-Meets-February-Record-Peak-Demand.

———. 2015h. "TVA Response to Administration's FY 2016 Budget." News release, February 2. https://www.tva.gov/Newsroom/Press-Releases/TVA-Response-to-Administration-FY-2016-Budget.

———. 2015i. "TVA's Integrated Resource Plan Calls for Low-Cost, Reliable Energy Choices." News release, July 13. https://www.tva.com/Newsroom/Press-Releases/TVA-Integrated-Resource- Plan-Calls-for-LowCost,-Reliable-Energy-Choices.

———. 2016a. *Budget Proposal and Management Agenda: For the Fiscal Year Ending September 30, 2017*. https://www.tva.com/file_source/TVA/Site%20Content/About%20TVA/Guidelines%20and%20Reports/FY17%20Performance%20Report%20-%20FINAL.pdf

———. 2016b. "Fiscal Year 2016 Conference Call." November 15, 2016. Accessed December 13, 2016. http://www.snl.com/Cache/1500093347.PDF?O=PDF&T=&Y=&D=&FID=1500093347&iid=4063363.

———. 2016c. Form 10-K.

———. 2016d. "Mild Weather Impacts TVA's First Quarter Earnings." February 3, 2016. Accessed December 12, 2016. https://www.tva.gov/Newsroom/Press-Releases/Mild-Weather-Impacts-TVA%E2%80%99s-First-Quarter-Earnings.

———. 2016e. "Renewable Energy Solutions." Accessed December 13, 2016. https://www.tva.gov/Energy/Renewable-Energy-Solutions.

———. 2016f. "TVA Board Meeting - August 25, 2016." August 25, 2016. Accessed December 12, 2016. https://www.tva.gov/About-TVA/Our-Leadership/Board-of-Directors/Meeting-Archive/TVA-Board-Meeting-August-25-2016.

———. 2016g. "TVA Completes Bellefonte Sale." News release, November 14. https://www.tva.gov/Newsroom/Press-Releases/TVA-Completes-Bellefonte-Sale.

———. 2016h. "TVA Delivers on Its Mission of Serving the People of the Tennessee Valley." November 10, 2016. Accessed December 12, 2016. https://www.tva.gov/Newsroom/Press-Releases/TVA-Delivers-on-Its-Mission-of-Serving-the-People-of-the-Tennessee-Valley.

———. 2016i. "TVA's Watts Bar Unit 2 Achieves Commercial Operation." News release, October 19. https://www.tva.gov/Newsroom/Press-Releases/TVAs-Watts-Bar-Unit-2-Achieves-Commercial-Operation.

———. "Distributed Solar Solutions Contract." Accessed December 28, 2015. https://www.tva.gov/file_source/TVA/Site%20Content/Energy/Renewables/Distributed%20Solar%20Solutions/DSS%20Contract.pdf.

———. "Green Power Providers." Accessed December 28, 2015. https://www.tva.com/Energy/Renewable-Energy-Solutions/Green-Power-Providers.

———. "Green Power Providers: Frequently Asked Questions." Accessed February 10, 2015. http://www.tva.com/greenpowerswitch/providers/pdf/gpp_faq.pdf.

———. "Green Power Providers Program Participation Guidelines (Effective January 1, 2015)." Accessed December 28, 2015. https://www.tva.gov/file_source/TVA/Site%20Content/Energy/Renewables/Green%20Power%20Providers/GPP_Guidelines_2015.pdf.

———. "Green Power Providers Program Participation Guidelines (Effective January 7, 2016)." Accessed December 28, 2015. https://www.tva.gov/file_source/TVA/Site%20Content/Energy/Renewables/GPP%20Guidelines_2016%20FINAL.pdf.

———. "Guidelines for Distributed Solar Solutions." Accessed December 28, 2015. https://www.tva.gov/file_source/TVA/Site%20Content/Energy/Renewables/Distributed%20Solar%20Solutions/DSS%20Guidelines.pdf.

———. "Guidelines for Renewable Standard Offer." Accessed December 28, 2015. https://www.tva.com/file_source/TVA/Site%20Content/Energy/Renewables/Renewable%20Standard%20Offer/guidelines.pdf.

———. "Renewable Standard Offer Contract." Accessed December 28, 2015. https://www.tva.com/file_source/TVA/Site%20Content/Energy/Renewables/Renewable%20Standard%20Offer/contract.pdf.

———. "Solar Solutions Initiative: Frequently Asked Questions." Accessed December 28, 2015. https://www.tva.com/Energy/Renewable-Energy-Solutions/Solar-Solutions-Initiative/Solar-Solutions-Initiative-Q-%2B-A.

US Environmental Protection Agency. 2015. "Fact Sheet: Overview of the Clean Power Plan." Last modified August 6. Accessed December 28, 2015. http://www.epa.gov/cleanpowerplan/fact-sheet-overview-clean-power-plan.

US General Accounting Office 2003. "Tennessee Valley Authority Information on Lease-Leaseback and Other Financing Arrangements." June 2003. Accessed January 11, 2017. http://www.gao.gov/assets/240/238729.pdf.

US Government Publishing Office 2015. "Federal Register." October 23, 2015. Accessed December 13, 2016. https://www.gpo.gov/fdsys/pkg/FR-2015-10-23/pdf/2015-26890.pdf.

Appendix A: Tennessee's Allocation Formula

The TVA Act of 1933 (TVA Act) specifically directs that 5% of the Authority's "gross proceeds" be paid as payments in lieu of taxes (PILOTs) to states and local governments where the authority owns and operates property. (48 Stat. 58-59, 16 USC. § 831.) TVA interprets "gross proceeds" as their operating revenues from the sale of power to municipalities, cooperatives, and industries. The TVA Act specifically excludes sales to federal agencies from the PILOT calculation. Payments to each state are based on the amount of TVA-owned property and sales in each state. Tennessee's share based on those two factors has been close to 60% of the total each year.

Each state determines its own method of distributing the payments. The following chart shows the formula used by the State of Tennessee in distributing the funds among the state government, its agencies, counties, and cities.

Tennessee Valley Authority (Tennessee State Revenue Sharing Act)
Title 67, Chapter 9, Part 1
From the Allocation of TVA Payments in Lieu of Taxes in Tennessee
(after direct payments to counties and 1977-78 base payment to state, counties, and cities)

	Basis of Apportionment (§67-9-101)	Proration to Counties and Municipalities (§67-9-102)
Impact fees—paid to areas with TVA construction *(remainder allocated to CTAS, TACIR and Four Lakes Regional Development Authority)*	3%	
Retained by the State	48.5%	
Paid to Local Governments	48.5%	
Counties—70% of Local Share		
·Based on Percent of State Population		*30% (14.55% of total)*
·Based on Percent of State Land		*30% (14.55% of total)*
·Based on County's Percent of TVA Acreage in Tennessee		*10% (4.85% of total)*
Municipalities—30% of Local Share Based on Percent of State Population		*30% (14.55% of total)*
Total Allocated by State	100%	

Appendix B: Distribution of Counties' Share of TVA Payments in Lieu of Taxes to Tennessee by Tennessee Fiscal Year

Distribution of Counties' Share of TVA Payments in Lieu of Taxes to Tennessee

by Tennessee Fiscal Year

County	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	2010-11	2009-10
Anderson	$ 1,140,471	$ 1,173,627	$ 1,157,568	$ 1,107,511	$ 1,136,571	$ 1,147,126	$ 1,100,866	$ 1,094,873
Bedford	800,352	826,171	813,673	774,647	797,382	806,367	732,398	712,743
Benton	1,714,385	1,766,920	1,741,324	1,662,030	1,708,401	1,727,685	1,633,032	1,469,604
Bledsoe	492,676	508,555	500,872	476,869	490,848	496,357	468,146	457,660
Blount	1,443,998	1,489,557	1,467,505	1,398,641	1,438,757	1,454,611	1,326,878	1,286,226
Bradley	1,051,291	1,084,953	1,068,668	1,017,788	1,047,433	1,058,574	981,379	960,945
Campbell	1,307,542	1,348,530	1,328,569	1,266,520	1,302,746	1,317,495	1,254,904	1,169,473
Cannon	367,340	378,865	373,289	355,867	366,014	370,013	348,509	341,387
Carroll	780,040	805,454	793,157	754,741	777,115	785,932	758,072	740,922
Carter	825,098	851,393	838,655	798,916	822,077	831,293	810,761	745,961
Cheatham	553,870	571,916	563,184	535,905	551,793	558,053	525,121	513,074
Chester	397,676	410,633	404,364	384,777	396,185	400,680	374,276	365,940
Claiborne	943,604	973,360	958,919	913,968	940,195	950,780	895,244	936,118
Clay	276,122	285,118	280,766	267,166	275,086	278,207	265,325	259,238
Cocke	749,426	771,553	760,844	727,398	746,880	754,576	718,123	687,170
Coffee	962,603	993,854	978,703	931,481	959,016	970,045	908,690	918,183
Crockett	358,381	370,056	364,407	346,771	357,050	361,100	346,011	338,213
Cumberland	1,042,213	1,076,151	1,059,729	1,006,632	1,036,458	1,048,212	952,613	930,158
Davidson	4,593,798	4,741,771	4,670,173	4,446,488	4,576,766	4,628,107	4,361,282	4,268,764
Decatur	620,217	638,793	629,779	601,716	618,088	624,690	593,986	665,095
DeKalb	410,625	424,001	417,529	397,308	409,085	413,726	389,484	379,875
Dickson	809,854	836,184	823,445	783,642	806,824	816,097	813,609	795,534
Dyer	764,011	788,979	776,934	739,302	761,219	769,856	736,296	719,928
Fayette	947,735	978,614	963,673	916,995	944,181	954,893	851,112	831,587
Fentress	610,417	630,305	620,682	590,617	608,127	615,027	576,256	563,081
Franklin	1,113,088	1,147,012	1,130,560	1,079,303	1,109,196	1,121,190	1,043,522	1,013,308
Gibson	918,328	948,247	933,771	888,542	914,884	925,264	885,645	865,603
Giles	801,957	827,896	815,345	776,135	798,972	807,970	773,003	755,611
Grainger	976,602	1,005,707	991,550	947,604	973,279	983,827	926,382	680,311
Greene	1,099,096	1,134,480	1,117,355	1,063,869	1,095,024	1,107,326	1,039,792	1,049,044
Grundy	450,999	465,559	458,514	436,505	449,323	454,374	437,177	427,238
Hamblen	889,305	916,902	903,504	861,818	886,145	895,993	851,911	675,487
Hamilton	3,433,751	3,542,017	3,489,550	3,326,019	3,421,361	3,459,494	3,270,907	3,118,856
Hancock	265,524	274,174	269,989	256,913	264,528	267,529	253,632	247,774
Hardeman	842,070	869,506	856,231	814,757	838,912	848,431	814,763	796,857
Hardin	1,077,274	1,110,917	1,094,593	1,043,767	1,073,418	1,085,365	1,030,245	988,564
Hawkins	1,282,909	1,318,698	1,301,342	1,247,268	1,278,803	1,291,456	1,233,682	1,150,390
Haywood	663,010	684,599	674,151	641,516	660,525	668,026	642,046	637,295
Henderson	837,362	864,648	851,486	810,501	834,487	844,041	791,075	905,335
Henry	1,670,799	1,722,705	1,697,459	1,619,085	1,664,871	1,683,664	1,591,410	1,590,702
Hickman	782,792	807,737	795,667	757,959	779,742	788,395	736,402	719,850
Houston	414,070	426,986	420,714	401,205	412,591	417,208	393,999	328,036
Humphreys	1,552,477	1,599,168	1,576,452	1,505,955	1,547,147	1,564,093	1,477,349	1,434,579
Jackson	380,911	393,322	387,317	368,556	379,483	383,788	361,090	352,806
Jefferson	1,000,580	1,027,208	1,014,289	974,060	997,527	1,006,976	938,892	785,695
Johnson	490,759	505,769	498,499	475,815	489,034	494,287	470,204	430,290
Knox	3,506,590	3,617,045	3,564,161	3,397,172	3,493,517	3,531,930	3,256,384	3,159,403
Lake	218,474	225,592	222,148	211,388	217,655	220,124	211,242	206,548
Lauderdale	650,313	671,477	661,229	629,212	647,859	655,207	624,612	610,913

County	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	2010-11	2009-10
Lawrence	885,845	914,610	900,692	857,208	882,533	892,513	847,209	828,107
Lewis	361,711	373,390	367,739	350,084	360,367	364,419	342,683	334,886
Lincoln	788,370	813,863	801,528	762,990	785,435	794,280	749,557	732,646
Loudon	1,131,078	1,159,187	1,145,537	1,103,081	1,127,861	1,137,769	1,049,161	982,871
Macon	448,729	463,349	456,275	434,174	447,046	452,119	423,871	414,542
Madison	1,194,946	1,233,824	1,214,961	1,156,193	1,190,421	1,203,913	1,145,433	1,123,926
Marion	1,172,933	1,206,616	1,190,264	1,139,383	1,169,001	1,181,424	1,127,850	854,741
Marshall	580,870	599,491	590,481	562,331	578,726	585,187	540,818	528,833
Maury	1,171,466	1,209,217	1,190,947	1,133,882	1,167,122	1,180,242	1,078,721	1,032,125
McMinn	889,511	915,988	903,169	863,151	886,466	895,699	853,788	834,082
McNairy	726,774	750,453	738,589	702,813	723,650	731,860	690,053	674,317
Meigs	779,845	803,409	791,935	756,365	777,159	785,769	741,479	626,377
Monroe	1,585,671	1,630,983	1,608,999	1,540,592	1,580,511	1,596,657	1,495,898	1,483,670
Montgomery	1,648,543	1,702,216	1,676,246	1,595,111	1,642,365	1,660,987	1,412,457	1,381,430
Moore	203,279	209,673	206,575	196,911	202,544	204,788	183,409	190,208
Morgan	664,854	686,398	675,974	643,406	662,374	669,848	624,298	610,599
Obion	751,541	776,021	764,176	727,170	748,723	757,216	731,502	714,788
Overton	572,606	591,262	582,235	554,033	570,458	576,930	539,338	526,787
Perry	661,077	681,478	671,581	640,758	658,738	665,973	627,042	704,031
Pickett	190,643	196,854	193,849	184,459	189,928	192,082	181,526	177,361
Polk	790,102	810,455	800,594	769,837	787,770	794,908	758,495	726,080
Putnam	863,646	891,761	878,158	835,657	860,410	870,164	792,789	775,274
Rhea	1,150,431	1,183,879	1,167,614	1,117,108	1,146,610	1,158,702	1,089,000	1,006,074
Roane	1,594,781	1,639,940	1,620,023	1,551,797	1,591,648	1,607,852	1,535,851	1,365,497
Robertson	901,323	930,656	916,354	872,017	897,839	908,015	811,532	793,292
Rutherford	2,321,247	2,396,046	2,359,854	2,246,782	2,312,637	2,338,588	1,817,568	1,781,108
Scott	667,760	689,517	678,990	646,101	665,256	672,804	634,567	620,110
Sequatchie	364,355	375,932	370,330	352,829	363,022	367,039	333,743	326,486
Sevier	1,240,164	1,280,090	1,260,762	1,200,413	1,235,571	1,249,480	1,100,751	1,072,176
Shelby	6,964,888	7,185,270	7,078,634	6,745,491	6,939,521	7,015,996	6,980,900	6,838,956
Smith	479,384	494,172	487,014	464,662	477,683	482,832	454,953	460,698
Stewart	2,772,961	2,857,324	2,816,181	2,688,874	2,763,366	2,783,192	2,590,836	3,884,293
Sullivan	1,775,264	1,831,340	1,804,161	1,719,425	1,768,826	1,788,563	1,753,034	1,591,397
Sumner	1,624,332	1,676,777	1,651,393	1,572,119	1,618,297	1,636,538	1,432,404	1,443,937
Tipton	845,712	873,233	859,917	818,315	842,544	852,092	769,609	752,240
Trousdale	210,501	216,542	213,616	204,485	209,807	211,923	200,505	210,229
Unicoi	303,033	312,896	308,124	293,214	301,897	305,319	292,625	285,968
Union	1,062,503	1,093,583	1,078,448	1,031,532	1,058,960	1,070,325	1,012,221	856,127
Van Buren	331,407	341,952	336,847	320,909	330,195	333,869	315,160	292,671
Warren	749,031	772,074	760,921	726,089	746,379	754,395	722,461	737,504
Washington	1,155,001	1,191,801	1,173,993	1,118,365	1,150,766	1,163,545	1,063,613	1,038,675
Wayne	849,097	876,736	863,361	821,581	845,916	855,513	807,521	789,117
Weakley	809,450	835,781	823,040	783,237	806,419	815,559	782,975	769,342
White	579,453	598,047	589,045	560,941	577,315	583,797	563,790	520,087
Williamson	1,783,034	1,840,433	1,812,660	1,725,892	1,776,427	1,796,341	1,419,606	1,393,894
Wilson	1,319,411	1,361,917	1,341,350	1,277,095	1,314,518	1,329,268	1,147,797	1,124,413
Total	**$ 99,201,346**	**$ 102,309,124**	**$ 100,805,418**	**$ 96,107,481**	**$ 98,843,609**	**$ 99,921,756**	**$ 93,348,135**	**$ 91,294,220**

Appendix C: Distribution of Cities' Share of TVA Payments in Lieu of Taxes to Tennessee by Tennessee Fiscal Year

Distribution of Cities' Share of TVA Payments in Lileu of Taxes to Tennessee

by Tennessee Fiscal Year

City	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	2010-11	2009-10
Adams	$ 7,142	$ 7,428	$ 7,337	$ 7,003	$ 7,219	$ 7,314	$ 6,370	$ 6,226
Adamsville	25,015	26,012	25,693	24,530	25,281	25,615	22,429	21,927
Alamo	27,773	28,886	28,529	27,233	28,071	28,443	26,925	26,319
Alcoa	95,330	99,149	97,925	93,477	96,351	97,629	87,037	85,078
Alexandria	10,899	11,336	11,196	10,687	11,016	11,162	9,161	8,954
Algood	39,434	41,014	40,508	38,667	39,856	40,385	35,450	34,652
Allardt	7,153	7,440	7,348	7,014	7,230	7,326	7,225	7,062
Altamont	11,791	12,263	12,112	11,561	11,917	12,075	12,784	12,497
Ardmore	13,686	14,235	14,059	13,420	13,833	14,016	13,392	13,091
Arlington	136,411	141,876	140,125	133,759	131,338	133,080	109,241	106,782
Ashland City	51,236	53,289	52,631	50,240	51,785	52,472	45,578	44,552
Athens	151,990	158,074	156,125	149,039	153,617	155,653	150,203	146,825
Atoka	94,630	98,422	97,207	92,791	95,644	96,912	94,566	88,983
Atwood	10,583	11,007	10,872	10,378	10,697	10,839	11,254	11,001
Auburntown	3,035	3,157	3,118	2,976	3,068	3,108	2,836	2,772
Baileyton	4,863	5,058	4,995	4,768	4,915	4,980	5,672	5,544
Baneberry	5,438	5,656	5,586	5,333	5,497	5,570	5,278	5,159
Bartlett	637,351	662,887	654,705	604,217	622,796	631,057	528,413	516,518
Baxter	15,401	16,018	15,821	15,102	15,566	15,773	14,394	14,070
Bean Station	34,458	35,839	35,257	33,656	34,303	32,655	29,249	28,590
Beersheba Spring	5,382	5,598	5,529	5,277	5,440	5,512	6,223	6,083
Bell Buckle	5,641	5,868	5,795	5,532	5,702	5,778	4,558	4,455
Belle Meade	32,856	34,172	33,751	32,217	33,208	33,648	33,120	32,375
Bells	27,497	28,598	28,245	26,962	27,791	28,160	26,030	25,444
Benton	15,627	16,253	16,052	15,323	15,794	16,004	15,148	14,807
Berry Hill	10,865	6,302	6,224	5,941	6,124	6,205	7,585	7,414
Bethel Springs	8,101	8,426	8,322	7,944	8,188	8,297	8,587	8,393
Big Sandy	6,964	7,216	7,135	6,842	7,032	7,116	6,509	6,378
Blaine	20,941	21,780	21,511	20,534	21,165	21,446	18,974	18,030
Bluff City	20,003	20,787	20,536	19,623	20,213	20,475	17,995	17,600
Bolivar	61,120	63,569	62,784	59,932	61,774	62,594	65,295	63,825
Braden	3,182	3,309	3,268	3,120	3,216	3,259	3,050	2,981
Bradford	11,848	12,322	12,170	11,618	11,975	12,133	12,549	12,267
Brentwood	455,842	474,106	429,531	410,018	422,625	428,231	396,833	387,900
Brighton	30,859	32,095	31,699	30,259	31,189	31,603	29,665	28,997
Bristol	304,839	316,910	313,042	298,983	308,066	312,105	291,356	284,878
Brownsville	116,289	120,942	119,451	114,032	117,533	119,090	121,121	118,398
Bruceton	16,676	17,344	17,130	16,352	16,855	17,078	17,488	17,095
Bulls Gap	8,327	8,660	8,554	8,165	8,416	8,528	8,035	7,854
Burlison	4,795	4,987	4,926	4,702	4,847	4,911	5,098	4,983
Burns	16,563	17,227	17,014	16,241	16,741	16,963	16,194	15,830
Byrdstown	9,060	9,423	9,307	8,884	9,157	9,279	10,162	9,933
Calhoun	5,529	5,750	5,679	5,421	5,588	5,662	5,582	5,456
Camden	40,416	42,035	41,516	39,630	40,848	41,390	43,080	42,110
Carthage	26,018	27,061	26,727	25,513	26,297	26,646	25,332	24,762
Caryville	25,917	26,955	26,623	25,413	26,195	26,542	25,411	24,839
Cedar Hill	3,543	3,685	3,639	3,474	3,581	3,628	3,354	3,278
Celina	16,868	17,544	17,327	16,540	17,049	17,275	15,519	15,170
Centertown	2,742	2,852	2,816	2,688	2,771	2,808	2,892	2,827
Centerville	41,273	42,921	42,393	40,474	41,714	42,265	42,844	41,883
Chapel Hill	16,304	16,957	16,748	15,987	16,479	16,697	13,302	13,003
Charleston	7,345	7,639	7,545	7,202	7,424	7,522	7,090	6,930
Charlotte	13,934	14,493	14,314	13,664	14,084	14,271	18,580	18,162

City	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	2010-11	2009-10
Chattanooga	1,934,875	2,010,675	1,986,387	1,898,099	1,955,139	1,980,503	1,793,597	1,754,192
Church Hill	76,013	79,059	78,083	74,536	76,827	77,847	66,578	65,079
Clarksburg	4,434	4,612	4,555	4,348	4,482	4,541	3,207	3,135
Clarksville	1,499,878	1,559,970	1,540,715	1,470,723	1,515,943	1,536,051	1,164,312	1,138,105
Cleveland	466,579	485,242	479,262	457,524	471,568	477,813	421,870	412,391
Clifton	30,396	31,614	31,224	29,805	30,722	31,129	34,279	33,508
Clinton	113,165	117,614	116,189	111,007	114,355	115,843	108,017	105,634
Coalmont	9,489	9,869	9,747	9,305	9,591	9,718	10,669	10,428
Collegedale	93,445	97,189	95,990	91,629	94,446	95,699	73,307	71,657
Collierville	513,938	534,530	527,932	503,948	519,443	508,019	498,590	487,367
Collinwood	11,080	11,524	11,382	10,864	11,199	11,347	11,524	11,265
Columbia	397,208	412,886	407,863	389,602	401,400	406,646	377,900	369,526
Cookeville	351,509	365,593	361,080	344,676	348,409	351,679	299,982	293,230
Coopertown	48,268	50,202	49,583	47,330	48,785	49,433	40,728	38,612
Copperhill	3,994	4,154	4,103	3,917	4,037	4,090	5,751	5,621
Cornersville	13,472	14,012	13,839	13,210	13,616	13,797	11,704	11,441
Cottage Grove	993	1,033	1,020	974	1,004	1,017	1,092	1,067
Covington	101,975	106,061	104,752	99,993	103,068	104,435	95,241	93,097
Cowan	19,848	20,633	20,382	19,467	20,058	20,321	20,169	19,721
Crab Orchard	8,485	8,825	8,716	8,320	8,576	8,689	9,431	9,218
Cross Plains	19,339	20,114	19,866	18,963	19,546	19,805	17,522	17,128
Crossville	124,361	129,343	127,747	119,432	123,104	124,737	117,411	114,768
Crump	16,112	16,758	16,551	15,799	16,285	16,501	17,117	16,732
Cumberland City	16,676	16,816	16,771	16,607	16,713	16,760	16,723	16,643
Cumberland Gap	5,574	5,797	5,726	5,465	5,633	5,708	2,656	2,596
Dandridge	32,538	33,809	33,402	31,921	32,878	33,303	24,196	23,669
Dayton	83,688	86,938	85,897	82,110	84,557	85,645	73,789	72,185
Decatur	18,030	18,753	18,521	17,680	18,223	18,465	16,048	15,687
Decaturville	9,858	10,250	10,124	9,668	9,963	10,094	9,743	9,525
Decherd	26,660	27,727	27,385	26,142	26,945	27,303	25,297	24,728
Dickson	164,032	170,604	168,498	160,843	165,789	167,988	216,906	212,024
Dover	15,988	16,629	16,423	15,677	16,159	16,374	16,228	15,863
Dowelltown	4,005	4,166	4,115	3,928	4,048	4,102	3,399	3,322
Doyle	6,059	6,302	6,224	5,941	6,124	6,205	6,347	6,204
Dresden	33,905	35,264	34,828	33,246	34,268	34,723	35,067	34,278
Ducktown	5,359	5,574	5,505	5,255	5,417	5,489	4,805	4,697
Dunlap	54,350	56,527	55,829	53,294	54,932	55,661	52,983	51,791
Dyer	26,413	27,472	27,133	25,900	26,696	27,050	27,077	26,467
Dyersburg	193,446	201,197	198,713	189,686	195,518	198,112	196,402	191,981
Eagleville	6,815	7,088	7,000	6,682	6,888	6,979	6,325	6,182
East Ridge	236,705	246,189	243,150	232,104	239,240	242,414	232,279	227,051
Eastview	7,954	8,273	8,171	7,800	8,040	8,146	6,955	6,798
Elizabethton	161,236	167,644	165,591	158,127	162,949	165,094	159,034	155,483
Elkton	6,522	6,783	6,699	6,395	6,591	6,679	6,820	6,666
Englewood	18,476	19,169	18,947	18,140	18,661	18,893	19,084	18,682
Enville	2,132	2,218	2,191	2,091	2,155	2,184	2,588	2,530
Erin	14,939	15,537	15,345	14,648	15,099	15,299	16,768	16,391
Erwin	68,816	71,573	70,690	67,479	69,553	70,476	65,274	63,805
Estill Springs	25,584	26,513	26,215	25,133	25,832	26,143	28,214	27,633
Ethridge	5,247	5,457	5,389	5,145	5,303	5,373	6,032	5,896
Etowah	39,377	40,955	40,450	38,612	39,799	40,327	41,223	40,295
Fairview	90,286	90,594	89,476	85,411	88,037	89,205	78,934	77,158
Farragut	255,852	242,633	239,638	228,751	235,785	238,913	221,892	216,897
Fayetteville	77,081	80,167	79,178	75,584	77,906	78,939	79,369	77,584
Finger	3,362	3,497	3,454	3,297	3,398	3,443	3,939	3,850
Forest Hills	56,866	59,144	58,414	55,761	54,875	55,603	53,006	51,812
Franklin	748,991	778,995	769,381	691,474	712,731	722,184	632,821	618,580
Friendship	7,542	7,844	7,747	7,395	7,623	7,724	6,847	6,693
Friendsville	10,301	10,714	10,582	10,101	10,412	10,550	10,016	9,790
Gadsden	5,303	5,515	5,447	5,200	5,360	5,431	6,223	6,083
Gainesboro	10,854	11,289	11,150	10,643	10,970	11,116	9,892	9,669

City	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	2010-11	2009-10
Gallatin	388,957	355,313	350,927	334,984	345,284	349,864	269,158	263,099
Gallaway	7,672	7,980	7,881	7,523	7,755	7,857	7,495	7,326
Garland	3,498	3,638	3,593	3,430	3,535	3,582	3,691	3,608
Gates	7,300	7,593	7,499	7,158	7,378	7,476	10,140	9,911
Gatlinburg	44,500	46,283	45,712	43,635	44,977	45,573	38,060	37,204
Germantown	452,706	470,844	465,032	443,906	457,555	448,845	461,148	450,768
Gibson	4,468	4,647	4,590	4,381	4,516	4,576	4,659	4,554
Gilt Edge	5,382	5,598	5,529	5,277	5,440	5,512	5,503	5,379
Gleason	16,304	16,957	16,748	15,987	16,479	16,697	16,464	16,094
Goodlettsville	179,636	186,833	184,527	176,144	181,560	183,968	166,118	162,379
Gordonsville	13,686	14,235	14,059	13,420	13,833	14,016	14,045	13,729
Grand Junction	3,667	3,814	3,767	3,596	3,706	3,755	3,612	3,531
Graysville	16,947	17,626	17,408	16,618	17,129	17,356	17,342	16,952
Greenback	12,005	12,486	12,332	11,772	12,134	12,295	10,736	10,494
Greenbrier	72,583	75,491	74,560	71,172	73,361	74,334	60,467	59,106
Greeneville	170,160	176,969	174,788	166,857	171,981	174,259	174,122	170,208
Greenfield	24,619	25,606	25,290	24,141	24,883	25,213	24,848	24,289
Gruetli-Laager	20,456	21,276	21,013	20,058	20,675	20,949	21,011	20,538
Guys	5,258	5,469	5,401	5,156	5,314	5,385	5,436	5,313
Halls	25,443	26,462	26,136	24,948	25,716	26,057	26,008	25,422
Harriman	74,645	77,516	76,596	73,252	75,412	76,373	78,894	77,186
Harrogate	49,521	51,505	50,869	48,558	50,051	50,715	49,798	48,677
Hartsville	26,729	27,800	27,457	26,210	27,016	27,374	26,953	26,346
Henderson	71,184	74,036	73,122	69,800	71,947	72,901	69,718	68,148
Hendersonville	579,628	602,851	595,410	568,360	585,836	593,607	485,760	474,826
Henning	10,662	11,090	10,953	10,455	10,777	10,920	13,707	13,399
Henry	5,235	5,445	5,378	5,134	5,291	5,362	5,852	5,720
Hickory Valley	1,117	1,162	1,147	1,095	1,129	1,144	1,531	1,496
Hohenwald	42,644	44,342	43,798	41,820	43,098	43,666	42,501	41,550
Hollow Rock	8,101	8,426	8,322	7,944	8,188	8,297	10,837	10,594
Hornbeak	6,014	6,255	6,178	5,897	4,835	4,899	4,895	4,785
Hornsby	3,419	3,556	3,512	3,352	3,455	3,501	3,444	3,366
Humboldt	95,367	99,188	97,964	93,513	96,388	97,667	106,544	104,145
Huntingdon	44,963	46,764	46,187	44,089	45,444	46,047	48,943	47,841
Huntland	9,839	10,233	10,107	9,647	9,944	10,076	10,309	10,076
Huntsville	17,861	18,577	18,023	17,204	17,482	15,310	12,694	12,409
Iron City	-	-		-	-	-	-	4,048
Jacksboro	22,792	23,705	23,412	22,349	23,036	23,341	21,236	20,758
Jackson	737,332	766,812	757,366	723,030	745,213	755,078	672,772	657,664
Jamestown	22,103	22,989	22,705	21,674	22,340	22,636	20,696	20,230
Jasper	37,493	38,995	38,514	36,278	37,393	37,889	36,170	35,356
Jefferson City	96,225	100,063	98,833	94,363	92,199	93,416	97,486	95,301
Jellico	26,571	27,636	27,295	26,055	26,856	27,212	27,549	26,929
Johnson City	715,553	744,102	734,954	701,702	723,185	732,738	643,659	629,238
Jonesborough	56,990	59,274	58,542	55,882	57,601	58,365	52,297	47,456
Kenton	14,453	15,033	14,847	14,173	14,608	14,802	14,698	14,367
Kimball	15,740	16,370	16,168	15,434	15,908	16,119	14,765	14,433
Kingsport	578,522	601,701	594,274	567,165	576,588	569,376	516,573	498,257
Kingston	69,772	72,455	71,595	68,471	70,490	71,387	62,060	60,726
Kingston Springs	31,096	32,342	31,942	30,491	31,429	31,846	31,207	30,504
Knoxville	2,055,742	2,136,605	2,110,695	2,016,510	2,077,360	2,104,418	1,994,445	1,950,396
Lafayette	50,480	52,502	51,854	49,499	51,021	51,697	43,721	42,737
Lafollette	84,289	87,660	86,580	82,654	85,190	86,318	89,935	87,915
Lagrange	1,501	1,561	1,541	1,471	1,517	1,537	1,531	1,496
Lakeland	140,247	145,866	144,066	137,521	141,749	143,630	122,082	119,334
Lakesite	20,603	21,428	21,164	20,202	20,823	21,100	21,607	21,121
Lakewood	-	-		-	-	-	26,345	25,752
La Vergne	367,689	382,421	377,700	360,541	371,627	376,557	297,405	290,711
Lawrenceburg	117,659	122,373	120,862	115,371	118,919	120,496	121,496	118,762
Lebanon	370,099	308,125	304,331	290,541	299,451	303,412	280,015	273,730
Lenoir City	99,032	102,938	101,687	97,136	100,076	101,383	78,264	76,537

City	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	2010-11	2009-10
Lewisburg	125,914	130,931	129,324	123,479	127,255	128,934	117,859	115,221
Lexington	86,536	89,995	88,887	84,858	87,461	88,618	83,398	81,526
Liberty	3,498	3,638	3,593	3,430	3,535	3,582	4,130	4,037
Linden	10,252	10,662	10,531	10,053	10,362	10,499	11,430	11,172
Livingston	45,786	47,621	47,033	44,896	46,277	46,890	44,678	43,672
Lobelville	10,121	10,526	10,396	9,924	10,229	10,365	11,535	11,276
Lookout Mountain	20,670	21,499	21,233	20,269	20,892	21,169	22,508	22,001
Loretto	19,339	20,114	19,866	18,963	19,546	19,805	19,919	19,471
Loudon	63,986	66,419	65,639	62,806	64,636	65,450	53,645	52,511
Louisville	45,357	47,175	28,268	26,984	27,814	28,183	23,847	23,310
Luttrell	12,118	12,603	12,448	11,882	12,248	12,410	13,212	12,915
Lynchburg	6,527	6,786	6,703	6,402	6,596	6,683	5,667	5,541
Lynnville	3,294	3,424	3,382	3,231	3,328	3,372	4,613	4,511
Madisonville	51,642	53,711	53,048	50,638	52,195	52,888	44,329	43,331
Manchester	113,980	118,547	117,084	111,765	115,201	116,729	106,259	103,867
Martin	129,862	135,049	133,387	127,346	131,249	132,984	118,747	116,083
Maryville	310,687	323,135	319,147	304,648	314,015	318,180	260,391	254,530
Mason	18,154	18,882	18,649	17,801	18,349	18,592	15,755	15,401
Maury City	7,605	7,909	7,812	7,457	7,686	7,788	9,037	8,833
Maynardville	27,226	28,317	27,967	26,697	27,517	27,882	20,054	19,603
McEwen	19,898	20,690	20,436	19,515	20,110	20,375	19,307	18,876
McKenzie	59,912	62,313	61,544	58,748	60,554	61,357	59,589	58,248
McLemoresville	3,972	4,131	4,080	3,894	4,014	4,067	3,432	3,355
McMinnville	153,763	159,913	157,943	150,779	155,407	157,465	144,116	140,878
Medina	49,487	51,470	50,834	38,490	39,674	40,200	32,467	31,736
Medon	2,550	2,652	2,619	2,500	2,577	2,057	3,027	2,959
Memphis	7,495,841	7,788,276	7,694,573	7,353,958	7,574,020	7,671,873	7,953,145	7,778,558
Michie	6,668	6,935	6,850	6,539	6,740	6,829	7,281	7,117
Middleton	7,966	8,285	8,183	7,811	8,051	8,158	7,540	7,370
Milan	88,582	92,132	90,994	86,860	89,531	90,719	88,736	86,739
Milledgeville	2,990	3,110	3,071	2,932	3,022	3,062	3,230	3,157
Millersville	72,662	75,573	74,641	71,250	73,441	74,415	68,975	67,422
Millington	125,602	130,634	129,022	115,526	116,045	117,584	117,411	114,768
Minor Hill	6,059	6,302	6,224	5,941	6,124	6,205	4,918	4,807
Mitchellville	2,132	2,218	2,191	2,091	2,155	2,184	2,330	2,277
Monteagle	13,449	13,988	13,815	13,188	13,593	13,774	13,932	13,619
Monterey	32,224	33,513	33,100	31,599	32,569	33,000	30,645	29,956
Morrison	7,830	8,144	8,044	7,678	7,914	8,019	7,698	7,524
Morristown	328,751	341,923	337,703	322,361	332,273	336,680	290,349	283,813
Moscow	6,273	6,525	6,444	6,151	6,341	6,425	6,426	6,281
Mosheim	26,650	27,718	27,376	26,132	26,936	27,293	23,205	22,683
Mount Carmel	61,255	63,709	62,923	60,064	61,911	62,732	53,962	52,747
Mount Juliet	317,717	330,446	284,515	271,590	279,941	273,520	283,979	277,587
Mount Pleasant	51,828	53,890	53,230	50,828	52,380	53,070	50,908	49,770
Mountain City	28,557	29,701	29,335	28,002	28,863	29,246	28,135	27,501
Munford	66,874	69,553	68,695	65,574	67,590	68,487	65,340	63,869
Murfreesboro	1,231,123	1,280,412	1,264,619	1,207,209	1,244,300	1,257,603	1,132,786	1,107,309
Nashville	4,852,060	5,046,186	4,983,984	4,757,875	4,903,958	4,968,915	4,471,129	4,370,642
New Hope	12,208	12,697	12,541	11,971	12,339	12,503	11,738	11,474
New Johnsonville	22,499	23,381	23,099	22,071	22,735	23,030	21,925	21,442
New Market	15,051	15,655	15,461	14,759	15,213	15,414	13,887	13,575
New Tazewell	34,266	35,639	35,199	33,600	34,633	35,093	32,355	31,626
Newbern	37,380	38,878	38,398	36,654	37,781	38,282	33,626	32,870
Newport	78,505	81,645	80,639	76,982	79,345	80,395	81,645	79,811
Niota	9,556	9,881	9,777	9,399	9,643	9,752	10,233	10,035
Nolensville	89,541	93,129	67,930	64,844	66,838	67,724	37,622	36,775
Normandy	1,591	1,655	1,634	1,560	1,608	1,629	1,587	1,551
Norris	18,380	19,116	18,880	18,023	18,577	18,257	16,273	15,907
Oak Hill	52,906	55,025	54,346	50,107	51,648	52,333	53,186	51,988
Oak Ridge	334,212	347,471	343,222	327,779	337,756	342,193	311,492	304,554
Oakdale	2,392	2,488	2,457	2,345	2,418	2,450	2,746	2,684

City	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	2010-11	2009-10
Oakland	74,727	77,721	76,762	73,274	75,527	76,529	35,663	34,861
Obion	12,626	13,131	12,969	12,380	12,761	12,930	12,762	12,475
Oliver Springs	36,455	37,916	37,448	35,747	36,846	37,334	37,171	36,335
Oneida	42,334	44,030	43,486	41,511	42,787	43,355	43,125	42,154
Orlinda	9,692	10,080	9,956	9,504	9,796	9,926	9,566	9,350
Orme	1,422	1,479	1,460	1,394	1,437	1,456	1,395	1,364
Palmer	7,582	7,886	7,789	7,435	7,663	7,765	8,170	7,986
Paris	114,590	119,181	117,710	112,362	115,817	117,353	109,871	107,398
Parkers Crossroads	3,723	3,873	3,825	3,651	3,763	3,813	3,196	3,124
Parrottsville	2,967	3,086	3,048	2,910	2,999	3,039	2,994	2,926
Parsons	27,268	28,341	27,997	26,748	27,555	27,914	28,662	28,028
Pegram	23,615	24,561	24,258	23,156	23,868	24,185	24,151	23,607
Petersburg	6,518	6,764	6,686	6,399	6,584	6,666	6,908	6,761
Philadelphia	7,402	7,698	7,603	7,258	7,481	7,580	5,998	5,863
Pigeon Forge	66,287	68,943	68,092	64,999	66,997	67,886	58,205	56,895
Pikeville	18,143	18,870	18,637	17,790	18,337	18,581	20,043	19,592
Piperton	18,414	16,957	16,748	15,987	16,479	16,697	12,582	12,299
Pittman Center	5,664	5,891	5,818	5,554	5,725	5,801	5,368	5,247
Plainview	23,976	24,937	24,629	23,510	24,233	24,555	21,000	20,527
Pleasant Hill	6,352	6,607	6,525	6,229	6,420	6,506	6,122	5,984
Pleasant View	46,813	48,689	48,088	45,903	47,314	47,942	46,861	45,806
Portland	129,528	134,718	133,055	127,010	130,916	132,652	123,128	120,357
Powells Crossroads	14,916	15,514	15,322	14,626	15,076	15,276	15,159	14,818
Pulaski	88,797	92,355	91,215	87,071	89,748	90,938	88,579	86,585
Puryear	7,571	7,874	7,777	7,424	7,652	7,753	7,506	7,337
Ramer	3,599	3,743	3,697	3,529	3,638	3,686	3,984	3,894
Red Bank	131,458	136,725	135,037	128,902	132,866	134,628	139,750	136,604
Red Boiling Springs	12,547	13,049	12,888	12,303	12,681	12,849	11,513	11,254
Ridgely	20,253	21,064	20,804	19,859	20,470	20,741	18,760	18,338
Ridgeside	4,400	4,577	4,520	4,315	4,447	4,506	4,378	4,279
Ridgetop	23,175	21,991	21,720	20,733	21,371	21,654	20,943	20,472
Ripley	95,285	99,102	97,879	93,432	96,305	97,583	88,275	86,288
Rives	3,678	3,826	3,778	3,607	3,718	3,767	3,725	3,641
Rockford	9,658	10,045	9,921	9,470	9,762	9,891	9,588	9,372
Rockwood	62,756	65,270	64,464	61,536	63,428	64,269	66,195	64,705
Rocky Top	20,595	21,400	21,142	20,204	20,810	21,079	21,747	21,269
Rogersville	49,871	51,869	51,229	48,901	50,405	51,073	48,200	47,115
Rossville	10,166	7,792	7,696	7,346	7,572	7,673	4,276	4,180
Rutherford	12,987	13,507	13,340	12,734	13,126	13,300	14,315	13,993
Rutledge	14,657	15,244	15,056	14,372	14,814	12,965	15,350	13,058
Saltillo	6,623	6,888	6,803	6,494	6,694	3,501	7,788	4,488
Samburg	2,448	2,547	2,515	2,401	2,475	2,507	2,926	2,860
Sardis	4,299	4,471	4,416	4,215	4,345	4,402	5,008	4,895
Saulsbury	1,264	1,314	1,298	1,239	924	936	1,114	1,089
Savannah	78,981	82,137	81,126	77,449	79,825	80,881	79,318	77,537
Scotts Hill	11,102	11,547	11,405	10,887	11,221	11,370	10,252	10,021
Selmer	49,605	51,593	50,956	48,641	50,137	50,802	51,109	49,959
Sevierville	167,067	173,760	171,616	163,819	168,856	171,096	140,121	136,967
Sharon	10,690	11,117	10,980	10,483	10,805	10,947	11,158	10,908
Shelbyville	233,394	242,587	239,641	228,934	235,852	238,928	186,414	182,307
Signal Mountain	94,359	98,140	96,929	92,525	86,144	87,287	86,936	84,979
Silerton	1,252	1,303	1,287	1,228	1,266	1,283	1,328	1,298
Slayden	2,008	2,089	2,063	1,969	2,030	2,057	2,555	2,497
Smithville	51,112	53,160	52,503	50,118	51,659	52,344	44,948	43,936
Smyrna	536,177	469,095	463,305	442,257	455,856	461,902	428,467	418,823
Sneedville	15,649	16,276	16,076	15,345	15,817	16,027	15,204	14,862
Soddy Daisy	143,451	149,199	147,357	140,663	144,988	146,911	129,757	126,836
Somerville	34,909	36,308	35,860	34,231	35,283	35,751	30,059	29,382
South Carthage	14,916	15,514	15,322	14,626	15,076	15,276	14,652	14,323
South Fulton	26,560	27,624	27,283	26,044	26,845	27,201	28,326	27,688
South Pittsburg	34,078	35,430	34,997	33,422	34,439	34,892	37,401	36,566

City	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	2010-11	2009-10
Sparta	57,595	59,888	59,153	56,483	58,208	57,288	56,986	55,712
Spencer	18,064	18,788	18,556	17,713	18,257	18,500	19,278	18,844
Spring City	23,722	24,618	24,331	23,288	23,962	24,261	24,160	23,647
Spring Hill	412,166	376,142	371,499	321,243	331,121	335,513	264,037	258,094
Springfield	185,492	192,924	190,542	181,886	187,479	189,965	174,772	170,838
St. Joseph	8,823	9,177	9,064	8,652	8,918	9,036	9,329	9,119
Stanton	5,100	5,304	5,239	5,001	5,155	5,223	6,921	6,765
Stantonville	3,193	3,321	3,280	3,131	3,227	3,270	3,511	3,432
Sunbright	6,228	6,478	6,398	6,107	6,295	6,378	6,493	6,347
Surgoinsville	20,321	21,135	20,874	19,926	20,538	20,811	20,943	20,472
Sweetwater	68,288	71,005	70,135	66,970	69,015	67,081	74,382	72,718
Tazewell	25,059	26,063	25,742	24,572	25,328	25,629	25,051	24,487
Tellico Plains	9,967	10,365	10,238	9,774	10,074	10,207	9,705	9,488
Tennessee Ridge	15,435	16,054	15,855	15,135	15,600	15,807	15,013	14,675
Thompson's Station	30,250	31,462	31,073	24,274	25,020	25,352	19,390	18,954
Three Way	19,283	20,055	19,808	18,908	19,489	19,748	18,850	18,426
Tiptonville	50,367	52,385	51,738	49,388	50,907	51,582	53,625	52,417
Toone	4,107	4,272	4,219	4,027	4,151	4,206	3,714	3,630
Townsend	5,055	5,257	5,192	4,957	5,109	5,177	2,746	2,684
Tracy City	16,710	17,380	17,165	16,385	16,889	17,113	18,895	18,470
Trenton	48,110	50,038	49,420	47,175	48,626	49,271	52,702	51,515
Trezevant	9,692	10,080	9,956	9,504	9,796	9,926	10,309	10,076
Trimble	7,187	7,475	7,383	7,048	7,264	7,361	8,193	8,008
Troy	15,469	16,089	15,890	15,168	15,635	15,842	14,326	14,004
Tullahoma	211,158	219,591	216,889	207,066	213,412	216,234	203,176	198,617
Tusculum	30,046	31,250	30,865	29,462	30,368	30,771	28,112	27,479
Unicoi	40,980	42,622	42,095	40,183	41,419	41,968	39,602	38,711
Union City	122,928	127,853	126,275	120,538	124,244	125,892	122,397	119,642
Vanleer	4,457	4,635	4,578	4,370	4,505	4,564	5,109	4,994
Viola	1,478	1,537	1,518	1,449	1,494	1,514	1,452	1,419
Vonore	16,631	17,297	17,084	16,308	16,809	17,032	13,077	12,783
Walden	21,415	22,273	21,998	20,999	21,644	21,932	22,058	21,561
Wartburg	10,358	10,773	10,640	10,156	10,469	10,608	10,016	9,790
Wartrace	7,345	7,639	7,545	7,202	7,424	7,522	7,090	6,930
Watauga	5,168	5,375	5,308	5,067	5,223	5,292	4,535	4,433
Watertown	16,665	17,333	17,119	16,341	16,843	17,067	15,316	14,972
Waverly	46,317	48,172	47,578	45,416	46,813	47,434	45,679	44,651
Waynesboro	27,632	28,739	28,384	27,095	27,928	28,298	25,074	24,509
Westmoreland	24,890	25,887	25,568	24,406	25,157	25,490	23,554	23,024
White Bluff	36,173	37,622	37,158	35,470	36,561	37,046	32,962	32,221
White House	115,707	120,343	118,857	113,457	116,946	118,497	111,312	108,806
White Pine	24,777	25,770	25,452	24,296	25,043	25,375	22,474	21,968
Whiteville	52,330	54,427	53,755	51,313	52,891	53,592	52,218	51,042
Whitwell	19,170	19,938	19,692	18,797	19,375	19,632	18,681	18,261
Williston	4,457	4,635	4,578	4,370	4,505	4,564	3,838	3,751
Winchester	99,278	103,134	101,898	97,407	100,308	101,599	85,513	83,657
Winfield	11,791	12,263	12,112	11,561	11,917	12,075	10,252	10,021
Woodbury	30,238	31,450	31,062	29,651	30,562	30,968	27,324	26,709
Woodland Mills	4,265	4,436	4,381	4,182	4,311	4,368	4,333	4,235
Yorkville	3,227	3,356	3,315	3,164	3,261	3,305	3,297	3,223
Total	**$ 41,237,328**	**$ 42,569,233**	**$ 41,924,787**	**$ 39,911,386**	**$ 41,084,012**	**$ 41,546,075**	**$ 38,728,809**	**$ 37,848,560**

Appendix D: TVA 2015 IRP Recommendations by Resource Type

Coal: Continue with announced plans to retire units at Allen, Colbert, Johnsonville, Paradise and Widows Creek. Evaluate the potential retirement of Shawnee Fossil Plant in the mid-2020s if additional environmental controls are required. Consider retirements of fully controlled units if cost effective.

Nuclear: Pursue additional power uprates at all three Browns Ferry units by 2023. Continue work on Small Modular Reactors as part of technology innovation efforts and look for opportunities for cost sharing to render these more cost-effective for our ratepayers.

Hydroelectric: Pursue an additional 50 MW of hydro capacity at TVA facilities and consider additional hydro opportunities where feasible.

Demand Response: Add between 450 and 575 MWs of demand reduction by 2023 and similar amounts by2033, dependent on availability and cost of this customer-owned resource.

Energy Efficiency: Achieve savings between 900 and 1,300 MW by 2023 and between 2,000 and 2,800 MWs by 2033. Work with our local power company partners to refine delivery mechanisms, program designs and program efficiencies with the goal of lowering total cost and increasing deliveries of efficiency programs.

Solar: Add between 150 and 800 MW of large-scale solar by 2023 and between 3,150 and 3,800 MW of large-scale solar by 2033. The trajectory and timing of solar additions will be highly dependent on pricing, performance and integration costs.

Wind: Add between 500 and 1,750 MW by 2033, dependent on pricing, performance and integration costs. Given the variability of wind selections in the scenarios, evaluate accelerating wind deliveries into the first 10 years of the plan if operational characteristics and pricing result in lower-cost options.

Natural Gas (Combustion Turbine and Combined Cycle): Add between 700 and 2,300 MW by 2023 and between 3,900 and 5,500 MW by 2033. The key determinants of future natural gas needs are trajectories on natural gas pricing and energy efficiency and renewables pricing and availability.

Source: Tennessee Valley Authority, *Integrated Resource Plan* (2015), 116-17.