

# Tennessee Valley Authority

## 2011 Performance

A Year-end Review of TVA's Accomplishments, Challenges



# Tennessee Valley Authority – TVA’s Performance

## Introduction

With challenges came success and with success came challenges for the Tennessee Valley Authority in 2011. Though TVA has been charting its yearly performance since its founding in 1933, this year may stand out from the rest. History was made in the decision to complete the Bellefonte nuclear site. There was a new chapter in the transformation of TVA’s power portfolio to cleaner energy. And TVA employees showed resilience and resourcefulness in their swift restoration of the transmission grid after it was crippled by one of the worst waves of tornadoes on record. All of this came under the tenants of a renewed vision for TVA and a newly completed energy roadmap to 2020 and beyond.

## Renewed Vision

This was the first year under TVA’s renewed vision. Approved by the TVA Board of Directors in August 2010, the vision is built on TVA’s original mission to serve the people of the Tennessee Valley region by providing reliable, low-cost electricity; managing the Tennessee River system; promoting economic development, and maintaining environmental stewardship. Under the vision, TVA is committed to improving its core business while emerging as a national leader in improved air quality and increased nuclear production, and the Southeast leader in increased energy efficiency by 2020. An Integrated Resource Plan completed in 2011 outlined a more diversified generation portfolio to support the vision and meet future power demands by transitioning away from coal to cleaner energy resources, including new nuclear generation and energy efficiency.

Over the next decade, TVA will be focusing on the following six areas of the vision — in every job in TVA and in every initiative TVA pursues — and TVA will evaluate its annual performance accordingly:



Low Rates



High Reliability



Responsibility



Cleaner Air



More Nuclear  
Generation



Greater Energy  
Efficiency

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## Hitting the Marks

TVA President and CEO Tom Kilgore has a name for accomplishments and challenges. He calls them “highlights and hard spots.” Here are some major ones that affected TVA’s annual performance in 2011.

### HIGHLIGHTS

- Integrated Resource Plan
- 99.999% transmission reliability (12<sup>th</sup> year)
- Top 10% in safety
- Improved organizational health scores
- Bellefonte Nuclear Unit 1 approval
- Magnolia Combined Cycle Plant purchase

### HARD SPOTS

- Sluggish economy
- April storms
- Nuclear refueling outages
- Browns Ferry Nuclear "red finding"
- Watts Bar Nuclear Unit 2 schedule delay

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## Key to Performance Targets

-  Top quartile/exceptional
-  2nd quartile/on target or better
-  3rd quartile/below target
-  4th quartile/poor

## Low Rates

**Positives – Lower fuel prices (natural gas), fewer temperature extremes.**

**Negatives – April storm, slow economy, higher non-fuel operations and maintenance costs.**



### Low Rates

TVA retail rates remain competitive and among the lowest in the country, though they have slipped from the top 25 percent. TVA rates now rank 40th lowest among the nation’s 100 largest utilities. TVA’s regional holding company peer group is traditionally among the lowest-cost in the country because of a reliance on coal. Among this group, TVA rates rank sixth among 10 regional utilities, and thus in the third quartile. TVA’s vision is to return to the top quartile by 2020. Although TVA’s peers have increased rates over the 2008-2010 period, TVA’s rates have risen at an increased relative pace, due in part to an increase in capital spending and higher non-fuel operating and maintenance costs.

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TVA, which receives no taxpayer money, is required under the TVA Act to set rates that are “as low as are feasible” yet sufficient to fund the operation, maintenance and administration of the TVA power system, make tax equivalent payments to states and counties, service its debt and maintain fund reserves. All of those costs affect electric rates.

In 2011, TVA rates benefited from lower natural gas prices, greater hydroelectric generation and fewer temperature extremes during a warmer winter and cooler summer. But a slow economic recovery combined with milder temperatures contributed to a 3.4 percent decline in electricity sales. Tornadoes in April caused extensive damage to the transmission system and left 850,000 people without power in Mississippi, Alabama and Tennessee. TVA spent \$134 million on repairs and supplemental power purchases because of the storm. Also impacting rates were higher-than-planned expenses for pensions due to lower bond market yields.

Capital spending in 2011 included the purchase of the Magnolia Combined Cycle Gas Plant (acquired at half the cost of new construction), construction of the John Sevier Combined Cycle Gas Plant, Bellefonte Nuclear Unit 1 development and construction of a seventh cooling tower at Browns Ferry Nuclear Plant. All of these projects support TVA’s long-term vision to increase nuclear generation and reduce air emissions.

## High Reliability

**Positives – 12<sup>th</sup> year of 99.999% reliability, April storm recovery.**

**Negatives – Coal and gas outages, nuclear refueling outages.**



### High Reliability

For a 12th consecutive year, TVA recorded 99.999 percent reliability of its transmission system in delivering power to customers. This embodies TVA’s commitment to “keeping the lights on.” It is a key indicator of overall quality of service. Excluding the impacts of major storm events, TVA performance measures for transmission system outages and interruptions were 18 percent and 21 percent better than expected this year, respectively. TVA’s system reliability has been in the top 25 percent for the past six years. In the wake of the April tornadoes, TVA again showed its dedication to reliability. Within a week of the storm, TVA restored service to 95 percent of the affected customer distributor delivery points. More than 4,000 employees and contractors were dispatched to rebuild the high-voltage transmission system. Working around the clock, they finished the job by early July. While the transmission system performed well, TVA’s plant reliability dipped slightly to 85.1 percent due to certain coal and gas plant outages and the refueling of five of six nuclear reactors in the same year.

## Responsibility

**Positives – Top 10% in safety, Natural Resource Plan, 43,000 new/retained jobs, higher OHI scores.**

**Negatives – Environmental violations.**



### Responsibility

TVA’s commitment to responsibility extends from employees to Valley stakeholders, building trust by carrying out TVA’s mission and creating public value. TVA continues its best-in-class performance in workplace safety. Based on OSHA recordable injury rate measures, TVA continues to be a top 10 percent performer overall. There were 101 job-related injuries among TVA’s 12,893 employees in 2011, seven fewer injuries than the year before. Reportable environmental events declined from 53 in 2010 to 24 in 2011, though the seven

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environmental violations for the year exceeded the 2011 target of six or fewer. The violations included improper storage of four fluorescent light bulbs at the Bull Run Fossil Plant.

Meanwhile, TVA’s internal program to improve organizational effectiveness showed improvement based on higher scores in employees’ Organizational Health Index surveys. From the initial OHI survey in 2009, TVA has moved from third to second quartile among utility companies, reflecting gains in eight of nine subject areas, including organizational direction, culture, innovation, coordination and accountability. TVA is targeting top quartile among OHI peers by 2014. Beyond delivery of reliable, low-cost power, TVA’s efforts to support the Tennessee Valley this year included the completion of a Natural Resource Plan to guide TVA’s stewardship of more than 293,000 acres of public lands for camping, recreation and wildlife habitat. And TVA’s economic development efforts, conducted in partnership with local utilities and community and government officials, helped retain or attract about 43,000 jobs, representing about \$4.9 billion in capital investment by more than 140 companies.

## Cleaner Air

**Positives – Decision to idle/retire higher-emitting coal units; wind contracts; emission reductions.**

**Negatives – Kingston scrubber performance.**



### Cleaner Air

TVA has significantly reduced air emissions from its power plants over the years with the investment of more than \$5 billion in clean-air controls and technologies. TVA’s renewed vision sets a goal of national leadership in cleaner air by 2020, and the Integrated Resource Plan outlines an energy roadmap to make that happen. In 2011, the TVA Board voted to retire 18 of TVA’s 59 coal-fired units by the end of 2017 and convert, idle or retire 16 others by the end of 2019. Seven units were idled or retired by the end of 2011. Delays in bringing a new scrubber online at the Kingston Fossil Plant prevented additional gains there.

TVA currently leads the nation in reducing total carbon dioxide emissions from 2005 to 2010, is sixth out of 20 peers in reducing sulfur dioxide emissions and is second out of the 20 largest U.S. utilities in reducing nitrogen oxide. Preliminary estimates show TVA’s NOx emissions declined about 4.8 percent and CO<sub>2</sub> emissions declined 3.8 percent in 2011 compared with 2010. Without the Kingston scrubber, sulfur dioxide emissions rose about 4.6 percent in 2011 compared with the year before. TVA aims by 2020 to reduce CO<sub>2</sub> emissions by 28.7 million tons, SO<sub>2</sub> emissions by 394,000 tons and NOx emissions by 163,000 tons. In 2011, TVA programs supporting Valley-generated alternative energy, such as solar panels on houses and businesses, grew to nearly 700 installations. TVA also began taking delivery from the first of several contracts for more than 1,500 megawatts of renewable energy from wind farms in the Midwest.

## More Nuclear Generation

**Positives – Bellefonte Unit 1 approval, Browns Ferry record run/performance during April storm.**

**Negatives – Browns Ferry “red finding,” Watts Bar Unit 2 schedule delay.**



### More Nuclear

TVA took a major step in 2011 toward its strategic objective of leading the nation in increased nuclear generation by 2020. Following an Integrated Resource Plan outline for new nuclear capacity, the TVA Board voted to complete one of two partially built reactors at the Bellefonte Nuclear Plant by 2020. With the return to service of Browns Ferry’s Unit 1 reactor in 2007, TVA was already leading the nation in total nuclear capacity gains since 2000. TVA’s vision is to achieve a total of 2,842 megawatts in nuclear capacity by 2020. Bellefonte Unit 1 promises to add 1,260 megawatts in the 2018-2020 time frame. The completion of Watts Bar

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Unit 2 will add about 1,180 megawatts. Highlights of 2011 included the safe shutdown of Browns Ferry Nuclear Plant during the April storms, proactive measures to build lessons learned from the Fukushima nuclear event into TVA’s daily operations and a record run of 111 days of continuous operation by all three Browns Ferry units set on Sept. 28. But poor construction and operational performance lowered TVA’s overall nuclear grade. The Nuclear Regulatory Commission issued a “red finding” at Browns Ferry after TVA discovered and reported a defective coolant valve, prompting increased NRC scrutiny. Construction of a seventh cooling tower at Browns Ferry and completion of the Watts Bar Unit 2 reactor fell behind schedule, with the cooling tower now expected to be completed in 2012 and Watts Bar Unit 2 in 2013.

## Greater Energy Efficiency

**Positives – Energy reduction goal exceeded, internal energy savings, 25,000<sup>th</sup> home audit reached.**

**Negatives – Demand reduction goal not met, Green Power Switch participation.**

### Greater Energy Efficiency

In partnership with local utilities and directly served industrial customers, TVA is employing a variety of energy saving strategies to achieve its vision of Southeastern leadership in energy efficiency. Strong performances in the heat pump, weatherization assistance and EnergyRight Solutions for Business programs helped produce 559 gigawatt-hours in energy savings in 2011, which was about 1.5 percent over the annual goal and more than double the previous year. TVA’s target for Southeastern leadership is a cumulative 11,400 gigawatt-hours in energy savings over 2010 levels by 2020. TVA has attained 765 gigawatt-hours in savings over two years. TVA didn’t reach its 2011 goal for reducing peak power demand, but it did achieve

374 megawatts in peak savings, which was more than double previous gains. TVA also found 24 gigawatt-hours of energy savings internally through motor replacements and system upgrades at four coal-fired power plants, and it rolled out seasonal and time-of-use rates that provide pricing signals to encourage shifts in energy consumption to less demanding periods.

TVA recorded its 25,000th home energy audit in 2011, representing both an accomplishment since the program began in 2009 and a first step in reaching some 4 million households in the TVA service area. Though the number of homegrown green power installations grew in 2011 (with pricing incentives from TVA), the number of consumers buying green energy blocks to support the incentives declined slightly.

## Conclusion

### 2011 Performance

TVA’s mission is to serve the people by providing reliable, low-cost power; managing the Tennessee River system; promoting economic development; providing environmental stewardship, and pursuing technological innovation. To succeed, TVA must create a high-performance culture and drive organizational productivity and performance within the company. Staying focused on the six strategic areas of the vision and gauging performance regularly to identify and address gaps will allow TVA to achieve and maintain top quartile results. TVA met or exceeded the mark in four of the six areas in 2011 and made strong gains

under challenging conditions in the other two. The overall result was a good performance.