

# Value to the Valley

TVA has added value to the region it serves for 70 years. TVA was created to help develop the Tennessee Valley and to provide a source of stability in the region.

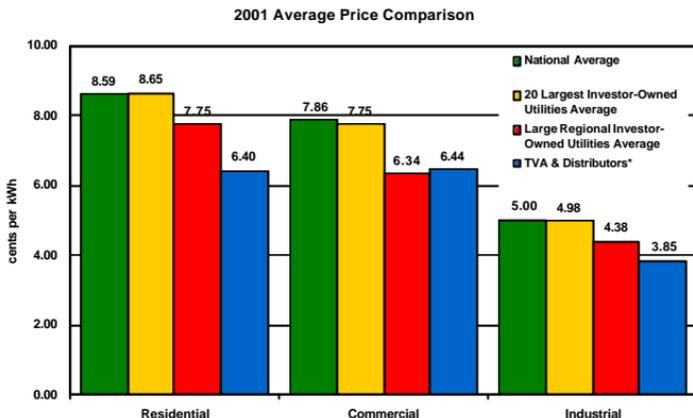
The benefits TVA provides are no less significant today. TVA enables a higher quality of life and supplies a significant economic value to the people of the Tennessee Valley. The benefits the Valley receives from TVA include affordable and reliable power, investment in the communities that TVA serves, environmental research, stewardship of the Tennessee River system, and support for economic development.



## The Benefits of Public Power

One of the most important ways TVA adds value to the Valley is through its role as a public power provider. TVA is first concerned with the long-term decisions that affect the quality of life of customers, while IOUs must consider the profit expectations of their shareholders. TVA's primary commitment is to the people of the Tennessee Valley. Because of this, long-term decisions that affect quality of life in the Valley must come first for TVA.

The presence of public power in regional and national energy markets helps to keep power rates lower. The average residential power rate in the areas served by TVA and distributors of TVA power is 6.40 cents per kilowatt-hour (kWh), 25 percent below the national average residential rate of 8.59 cents per kWh. TVA, as a public power provider, serves as a positive influence on prices in the Southeastern region and in the power industry overall.



Source: *Plant's PowerDat* - January 2003 release. Note: Large regional IOUs are those operating primarily within the Eastern Interconnection with regulated net generation greater than 50 million megawatt-hours in calendar year 2001. \*TVA & Distributors average industrial rate includes customers directly served by TVA. The average industrial rate in the TVA region not including directly served industrial customers of TVA is 4.57 cents per kWh. National average includes TVA & Distributors of TVA power.

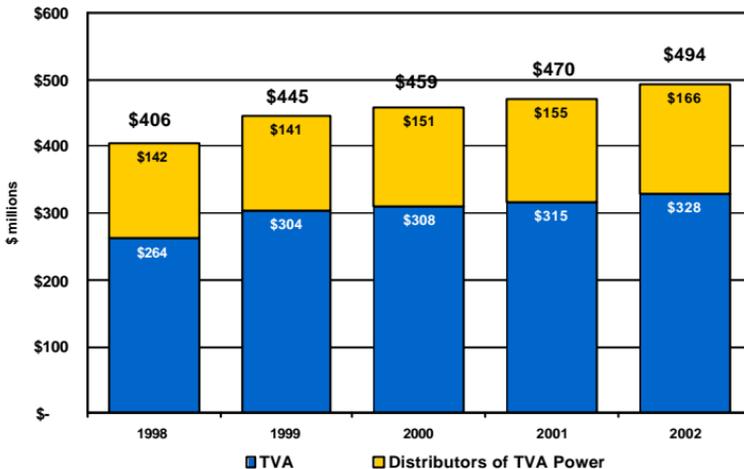
## The Economic Benefits of TVA

TVA provides a direct benefit to the rural areas, towns, counties, and cities of the Valley region. TVA's 13,444 employees work and live in the areas they serve. The \$1.3 billion in total compensation they receive benefits these Valley communities. TVA strives to keep Valley dollars in the region. In 2002, TVA spent more than \$2 billion on goods, services, and fuel from businesses located in Valley states.

### Tax-Equivalent Payments

TVA makes tax-equivalent payments each year to the counties and states where its power-system property is located. TVA has paid \$1.5 billion to the areas it serves in just the past five years. When this figure is combined with tax and tax-equivalent dollars that distributors of TVA power have paid, the total amount is almost \$2.3 billion over the same time period.

TVA and Distributor Tax and Tax-Equivalent Payments



### Affordable and Reliable Power

TVA power helps bring jobs to and keep jobs in the Valley. Stable, affordable power rates are possible because of TVA's large, efficient, integrated power system. TVA does not rely on any one source of fuel, such as natural gas or coal, to generate the power the Valley needs, so Valley ratepayers are substantially protected against rapid increases in the prices of any one of these commodities.

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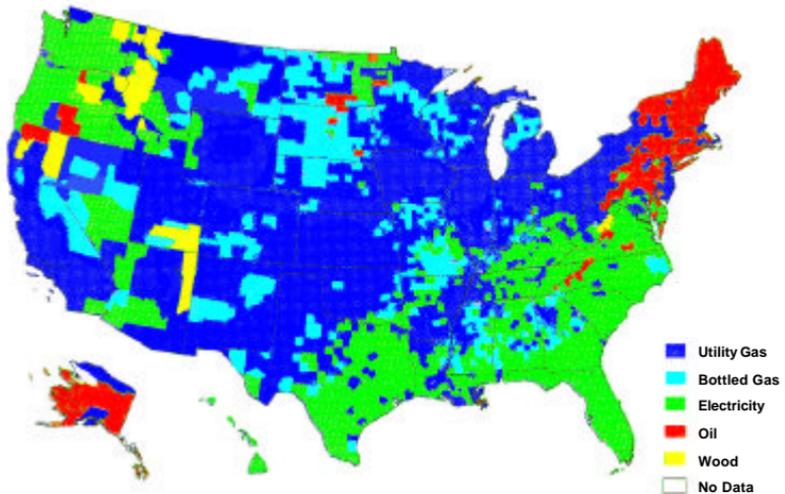
TVA has had only one general rate increase in 15 years, which has helped keep prices low in the area it serves. However, due to increasing costs associated with environmental compliance, TVA's Board is considering a staff recommendation for a 5.9 percent overall increase in average wholesale rates to be effective October 1, 2003. TVA staff also recommended a rate adjustment between customer classes that would result in a decrease in firm industrial prices and an increase for residential and commercial users. TVA staff has begun discussions about these recommendations with the distributors of TVA power and will make a final recommendation to the TVA Board this summer. The proposed 5.9 percent rate increase would result in an increase of \$365 million in annual revenues (ignoring the effect of price elasticity).

The primary benefit of TVA's integrated system is greater reliability. TVA's power-generating facilities and transmission infrastructure are located in strategic areas of the Valley to ensure a high degree of reliability for TVA customers. TVA has built an extremely reliable transmission system to serve the Valley, and this system is a key factor in recruiting industry to the Valley.

## Affordable Power for Valley Homes

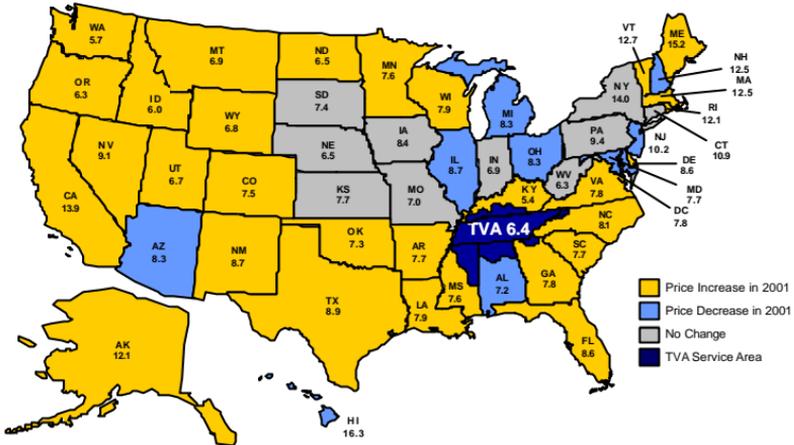
Lower rates are important for Valley families because electricity consumption in the Southeast is higher than in other parts of the country. Other areas of the nation primarily use natural gas or other fuels instead of electricity for home heating during the winter.

### Primary Home Heating Fuel Used



The average residential power rate in the areas served by TVA and distributors of TVA power is 25 percent below the national average. This difference has become more apparent in recent years as rates have increased in many states.

**2001 Average Residential Electricity Price Comparison**  
Cents per kWh



Sources: Platt's PowerDat – January 2003 Release

Note: Average price displayed in states partially in the TVA service area reflects average prices outside of the TVA service area.

## Economic Development

TVA fulfills its mission to the Tennessee Valley, in part, by helping to support sustainable economic development in its communities. TVA helps leverage state and local governments' efforts in recruiting diversified industry and high-quality jobs as part of a shared vision of the region's future. Since 1995, TVA has helped create or retain more than 260,000 jobs in the Valley. TVA helped create or retain more than 48,000 jobs in 2002 alone.

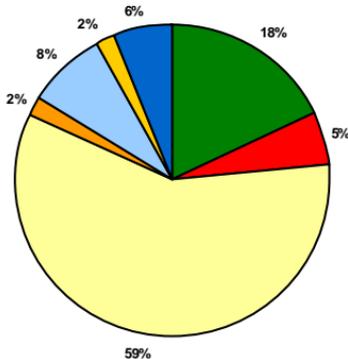
### *TVA Economic Development in 2002*

- Helped create or retain more than **48,000 jobs** by working with distributors and state and local officials.
- Provided **\$22 million** in economic development loans, leveraging about **\$180 million** in funding from other sources.

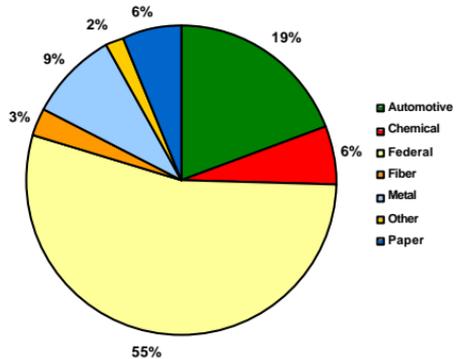
# Value to the Valley

TVA's presence in the Valley helps make the region competitive in attracting industry. TVA manages its integrated river and power system with the requirements of industry in mind. Some of TVA's largest directly served customers are attracted by the reliability and low cost of power that TVA provides, as well as access to low-cost shipping provided by the TVA navigation system. These directly served entities are often the top employers in their areas. In fact, the top 10 largest directly served TVA customers employ more than 120,000 people, with combined payrolls of more than \$6 billion. The average annual wage at the 10 largest directly served TVA customers is \$50,000.

**TVA Directly Served Industrial Customers**  
*Total Wages by Industry Type*



**TVA Directly Served Industrial Customers**  
*Employment by Industry Type*



TVA helps to recruit businesses that support higher than average wages to the Valley as part of its focus on improving the quality of life in the Valley. TVA helps do this by providing capital for attracting or retaining companies. TVA provides capital from several loan funds to help leverage investment from other sources. For every loan dollar TVA invests, \$27 is brought to the table by other investors. Since March 1995, TVA loan commitments of \$110 million have leveraged more than \$3 billion in additional investment from other sources.

TVA is also a partner, along with distributors of TVA power, in eight Regional Industrial Development Associations. This group provides integrated packages of economic incentives to prospective industries. For example, this group's efforts helped five companies decide to locate their operations in Franklin, Kentucky, last year, bringing 390 new jobs to that community.

Supporting Sustainable Development by Promoting Small Business – Part of supporting sustainable economic development is promoting the creation and development of small business. TVA is a pioneer in business incubation, supporting a network of more than 20 business incubators across the Valley that have helped create more than 1,100 companies and 6,100 jobs. One example was the creation of MPI Software Technology, Inc., in Starkville, Mississippi, that recently received a national award for excellence from the Small Business Administration.

Quality of Life – TVA's management of the region's natural resources, investments in reducing emissions, and the recreational opportunities provided by TVA's reservoirs and public lands are major contributors to the quality of life that helps draw employers to the region.



Community Investment – TVA directly contributes to the communities it serves in many other ways. TVA serves as an administrative agency for the Appalachian Regional Commission (ARC), a unique partnership between the federal government and the governors of 13 Appalachian states that helps provide economic and social development. For example, efforts led in part by the ARC and TVA helped Lane Manufacturing locate a production facility in Aberdeen, Mississippi, in 2002, that will bring 1,000 new jobs to the area over five years.

Growth Readiness – In cooperation with the State of Tennessee, TVA has developed a training program that helps communities address land-use and water-quality issues. This training is provided to planners and public works officials to assist them in preparing for future economic growth while complying with stormwater regulations and water-quality constraints.

TVA helps foster economic development in many other ways:

- *Technical Services* – One example is TVA's work with the Union County Development Authority in providing technical services that helped transform 197 acres into an industrial park near Blairsville, Georgia.

- *Minority Business Development* – TVA helps fund programs targeted to support the development and growth of minority-owned businesses. For instance, TVA contributed to the Memphis Business Academy, a joint venture with Memphis Light, Gas & Water to increase training and education for minority businesses and their employees.
- *Community Development* – For example, TVA designed and facilitated a strategic planning process for the two-county “Shoals” metropolitan area of north Alabama, which includes the communities of Florence, Muscle Shoals, Sheffield, and Tusculum. This was the first time the area had collaborated on such a plan. Many of the goals and recommendations deal with enhancing the unity of the area to improve its attractiveness for job creation. Teams are working on a range of community improvement and economic development projects.

## Quality of Life

TVA’s management of its integrated river and power systems directly adds to the quality of life in the Tennessee Valley by providing low-cost, reliable power, flood control, navigation, public recreation, and stewardship of the region’s natural resources.



## The Benefits of TVA’s River System Management

Valley residents fish and boat in clean waters, enjoy clean and abundant recreation venues, and are protected from devastating flood damage because of TVA’s integrated management of the Tennessee River system. TVA improves the quality of life in the Valley by serving as a steward of the river system, providing these multiple benefits to the people of the Valley.

TVA’s dams and reservoirs are part of an integrated-resource-management system where each facility is operated in relation to the others to get the maximum use of every drop of water. The system’s 49 dams are operated to balance multiple purposes and public benefits including navigation, flood control, power supply, water quality, and recreation. This integrated management approach ensures that water and land resources will be used in fair and balanced ways that will sustain and improve the watershed for future generations, as well as current users and stakeholders.

Abundant, Clean Water Supply – Valley residents who live and work in TVA watersheds rely on this water for quality of life. Overall water-quality condition is measured by stream and reservoir health, shoreline condition, and state assessments of water quality for 611 smaller watershed units of the Tennessee River system. For 2002, 512 of these units met or exceeded quality standards, up from 496 the year before.

TVA’s integrated resource management also ensures that precious water resources are not wasted. As water flows downstream, it is continually reused for consumption, wildlife habitat, navigation, coolant for power plants, energy to spin turbines, and recreation.

**Navigation** – The Tennessee River system is a major transportation artery, linking the Tennessee Valley’s industries to world markets. In 2002, TVA’s navigation channels and locks carried an estimated 50 million short-tons of cargo, with ports in 18 states depending on the river system for shipping. Valley industries save about \$450 million each year on the cost of goods shipped by barge, compared with shipping by other, more expensive means of transportation.



**Flood Control** – TVA’s management of the river system has helped to avert more than \$5 billion in flood damage within the Tennessee Valley and from the Ohio and Mississippi rivers. Drought conditions have persisted in the Valley region over the last few years. In 2002, however, several large storms came through the region bringing large amounts of rain very rapidly. TVA helped prevent an estimated \$90 million in potential flood damage within the Valley. TVA also coordinated with the U.S. Army Corps of Engineers to restrict water flow into the Ohio River on three separate occasions of flooding in 2002 in the Ohio and Mississippi River valleys, helping to avert an additional \$14 million in estimated damage in those areas. TVA’s river-management system helps avoid an estimated \$200 million in flood damage annually, based on information from the U.S. Army Corps of Engineers.

**Low-Cost Reliable Power** – TVA operates its integrated river and power system to maximize the value of water available for hydro generation while meeting the cooling-water needs of nuclear and coal-fired power plants. Being able to schedule water when and where it is needed helps TVA avoid ambient temperature-related plant deratings that could reduce system reliability and require the purchase of expensive on-peak power. Hydro generation is the most flexible form of generation. Hydro power units can quickly be started or ramped up or down to meet power-system needs. In addition, hydro units are the best sources for many of the ancillary services critical to system reliability and efficiency.

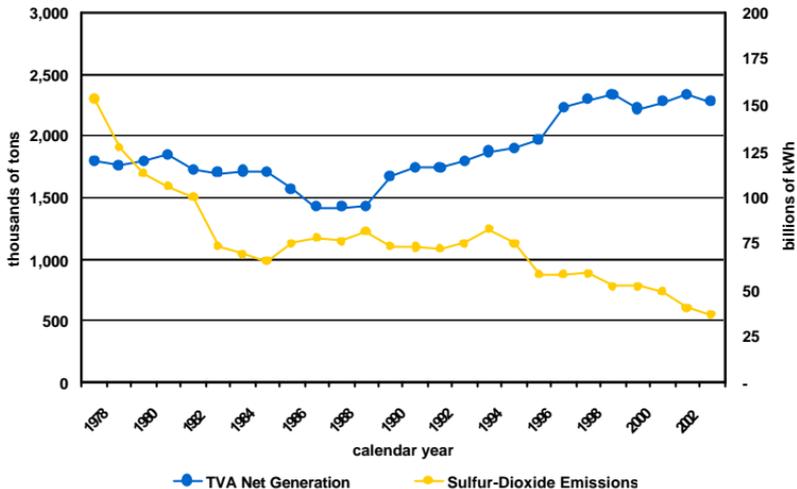
## Environmental Investment

In recent years, TVA has significantly increased capital expenditures on improvements that will ensure that TVA continues to meet all regulatory requirements. Because of TVA’s commitment to the region, TVA’s clean-air-compliance strategy relies on internally generated emission reductions, based on a portfolio of techniques to ensure the lowest overall cost of compliance while spreading the required capital over a longer time horizon. In some cases, this includes early compliance to build up allowance banks that then allow TVA to stretch out additional investments and optimize use of the regional labor force. TVA uses its emissions allowances to lower the risk of accidental noncompliance due to delays in controls installations or unplanned outages at plants where controls have been installed.

Clean-Air Expenditures								
millions of dollars								
Year	1995	1996	1997	1998	1999	2000	2001	2002
Expenditure	\$139	\$55	\$37	\$60	\$92	\$124	\$200	\$399

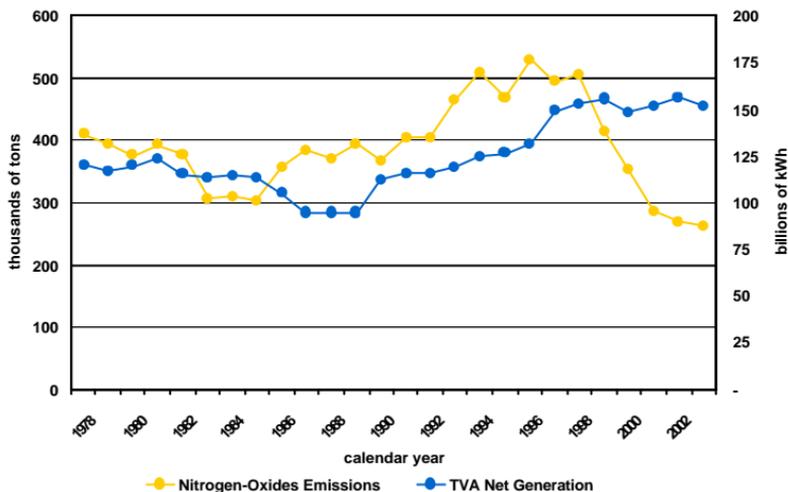
Since 1995, TVA has spent more than \$1 billion on clean-air equipment and pollution controls. TVA has installed six scrubbers at its fossil-fired power plants to help reduce sulfur-dioxide (SO<sub>2</sub>) emissions. In addition to its six installed scrubbers, TVA plans to install five more at an expected cost of about \$1.3 billion. Operation of the five additional scrubber systems will further reduce TVA SO<sub>2</sub> emissions by more than 200,000 tons a year. When these scrubbers are completed, TVA SO<sub>2</sub> emissions will be reduced by 85 percent from 1977 levels.

**TVA SO<sub>2</sub> Emissions**  
1977-2002



Low NO<sub>x</sub> burners or overfire-air modifications have been installed on 40 of TVA's 59 coal-fired units, and boiler optimization is being used on 19 units to further reduce NO<sub>x</sub> emissions. TVA is in the process of installing Selective Catalytic Reduction (SCR) systems or similar controls on 25 units to help reduce emissions of NO<sub>x</sub> from TVA plants. Four SCR systems are now installed and operable. NO<sub>x</sub> emissions from TVA plants during the summer ozone season are projected to be 75 percent below 1995 levels by 2005 when the planned NO<sub>x</sub>-reduction-equipment additions are completed. TVA expects to spend more than \$5 billion in clean-air and environmental initiatives by 2010.

**TVA NO<sub>x</sub> Emissions**  
1977 - 2002



## Energy and Environmental Research Initiatives

TVA adds additional value to the Valley and the nation through its involvement in energy and environmental research. Through its Public Power Institute (PPI), TVA helps bring new ideas and technologies to the world of electric energy. The scientific and technical expertise provided by PPI has helped shape government regulations and public policy to reduce the societal cost of emissions reductions while ensuring that regulations are focused on real health risks. TVA's dual role as a federal corporation and major power producer gives TVA a unique perspective on the potential tensions between the need to protect the environment and human health and the need to provide an adequate supply of low-cost, reliable power. PPI's influence has been extended through partnerships with land-grant universities, utilities, electric-power associations, and other research organizations.

Part of the focus of this research is in the area of developing cleaner and more efficient power-generation technologies. This includes development of more efficient power cycles for gas combustion and new ways of using coal with near-zero emissions. It also includes research into newly emerging distributed-generation technologies such as fuel cells and micro-turbines. In addition, TVA is leading the nation in the development of novel ways to store electricity.

Another example is the air-research partnership with the Great Smoky Mountains National Park, the most visited national park in the country and one of the most biologically diverse places on Earth. The park currently faces a number of problems including air-quality issues.

These air problems are caused by fossil-power-plant emissions, motor-vehicle exhaust, industrial emissions, and other factors. TVA collaborates with a number of partners—including the National Park Service, the Environmental Protection Agency, the National Oceanic & Atmospheric Administration, the Department of Energy, the Electric Power Research Institute, regional universities, and state and local air-quality programs—to find ways to deal with these problems. These collaborative efforts lower the costs of research by preventing duplication and quicken the dissemination of lessons learned.



Another example of this influence is TVA's reciprocating constructed-wetland technology. The latest system built using ReCip™ technology was constructed near Aliceville, Alabama, and is currently treating up to 30,000 gallons per day of anaerobic lagoon wastewater from a commercial swine-rearing facility. This wetland is providing significant removal of nitrogen, biochemical oxygen demand, and odor-producing compounds. ReCip™ systems of several different designs have been installed in the continental United States, Hawaii, and Egypt for treating municipal, industrial, and high-strength agricultural wastewater.

TVA energy-use initiatives strive to identify new technologies and processes that reduce the impacts of energy use and provide additional value to the consumer, while addressing power-system needs. TVA, partnering with Oak Ridge National Laboratory, was instrumental in the development of a frostless heat pump that improves occupant comfort. TVA also has helped develop a Zero-Energy Building concept that promotes efficient and sustainable residential building practices. Research into hybrid lighting has produced possibilities for commercial daylighting technologies in Valley businesses. Other energy-efficient technologies also benefit public health—for example, the use of Ultraviolet Germicidal Irradiation to reduce tuberculosis exposure in the Memphis-Shelby County Jail, and the use of ozone to improve product cleanliness and reduce water consumption during produce processing. TVA's ground-source heat-pump research has fostered the implementation of this technology in more than 10 million square feet of classrooms in the Valley.

TVA is also striving to promote the use of "green" power in the Valley. TVA's Green Power Switch® program was the first such renewable-energy program in the region to combine power available from wind, solar, and methane-gas technologies. Earlier this year, the U.S. Department of Energy's National Renewable Energy Laboratory ranked Green Power Switch® in the top 10 programs in the nation for the amount of new energy produced and the number of customers participating. TVA's wind turbines were the first commercial-scale wind turbines operating in the Southeast. Additionally, TVA continues to develop new technologies that utilize biomass from farms and other sources for the production of electricity and fuels.



While TVA is working to promote the use of “green” power, it is also promoting conservation. An example is the *energy right*® residential program. Similar to the Energy Star program, *energy right*® provides incentives for home builders, HVAC contractors, and homeowners to incorporate energy-efficient elements in homes. Because of this program, more than 43,000 heat pumps and 72,000 high-efficiency electric water heaters have been installed. Additionally, more than 56,000 homes have been built to *energy right*® standards since 1998. The efficiency gained from this program helps to reduce electricity consumption across the Valley.

