

Appendix C - Tennessee Valley Authority/Power Distributors Energy Efficiency Initiatives

TVA has a strong track record in promoting and demonstrating the wise use of energy. TVA and the distributors of TVA power have pursued such programs as part of their role as leaders in public power. We are continuing to explore opportunities to expand energy efficiency and peak load reduction as part of TVA's Strategic Plan approved by the TVA Board of Directors on May 31, 2007. Through the implementation of a combination of programs offered to residential, commercial, and industrial customers, TVA has achieved over 520 megawatts (MW) of demand reduction Valley-wide and addressed nearly 400,000 residences between 1997 and 2007.

These programs include:

- *energy right*,[®] Energy Services Company (ESCO), and geothermal programs
- On-site energy consulting with directly served customers, such as General Motors' (GM) Saturn Plant
- Energy audits and educational activities

Among the most successful TVA programs is the *energy right* Residential Program that was launched in 1996. By 2000, TVA achieved approximately 150 MWs of peak load reduction Valley-wide through implementation of the *energy right* initiatives. These initiatives promote high efficiency air conditioning (heating, ventilating, and air conditioning [HVAC]) systems, better thermal envelopes, and other measures that save energy and reduce peak demand for Valley residents. The impacts from these programs are expected to grow steadily with continued annual participation.

In addition, the Direct Load Control (DLC) Program provides approximately 50 MW of peak load reduction yearly through the cycling of residential water heaters and air conditioners by radio signal. This program offers Middle Tennessee homeowners incentives in return for allowing their appliances to be switched off remotely for short periods during peak loads. Such programs offer significant potential for energy management.

TVA Programs Currently Offered Through Local Power Distributors

The following sections provide brief explanations of today's programs that contribute to TVA's energy efficiency measures.

***energy right*[®] - Programs for Residential and Small Commercial Customers**

- **Residential Heat Pump Retrofit Program** promotes quality installations of higher efficiency heat pumps by members of the Quality Contractor Network.
- **Residential New Homes Program** promotes higher efficiency thermal envelope standards and quality construction in new homes and the installation of energy efficient heat pumps. This program provides training for homebuilders and trade allies to ensure proper installation of energy efficiency measures.
- **Residential Manufactured Homes Program** focuses on achieving improvements in the HVAC and thermal envelope components of manufactured housing. The program requires that the home be equipped with an energy efficient heat pump.

- **Home Audit** allows consumers through the use of online and paper do-it-yourself audits to understand their home's overall energy use and cost, as well as how to identify specific actions they can take to reduce energy bills. After performing an energy audit, participants will receive a Personal Energy Profile report.
- **Student Audit** provides students with packages presented at school to take home and use to conduct home audits. Students return the audit through the school for analysis, and recommendations are made for energy efficiency implementation measures.

Additional information on *energy right* Programs may be accessed at the following Web site www.energyright.com.

Programs for Business Customers

Many different programs are offered to commercial and industrial customers throughout the Valley. These include on-site energy evaluations, turnkey energy efficiency retrofits, geothermal heat pump expertise, pricing programs, and other assistance programs.

- **Energy Services Company (ESCO)** - One popular TVA/power distributor program offers energy services to businesses and industries through ESCO. This program lowers the customer's energy use, making the businesses more competitive and helping TVA reduce peak loads on its power system. The ESCO initiative provides technical expertise, project management support, and third-party financing to assist commercial and industrial (C&I) customers with energy efficiency upgrades and operational improvements.

TVA and power distributors also offer a variety of pricing options that give large energy users incentives to manage their electricity use.

Large Commercial and Industrial Services

The Large Commercial Program works to improve the efficiency and reduce the owning and operating costs of schools, restaurants, and other large commercial facilities. The Industrial Services Program develops energy solutions to industrial, environmental, productivity, and product process quality problems for Valley industries. Some examples are found below.

- **Commercial Geothermal Heat Pump Program** - Through a combination of offerings, including geothermal heat pump installations, the Large Commercial Program has successfully reduced energy consumption for hundreds of businesses and schools throughout the region. TVA/Power Distributor support for geothermal heat pumps has been instrumental in implementing this energy efficient technology throughout the region. During the last 10 years, TVA has helped owners, architects, and engineers apply geothermal heat pumps at nearly 300 commercial building projects, most of them schools.
- **Energy Management Assistance** - TVA has partnered with GM to assist with energy conservation at the GM Spring Hill, Tennessee, manufacturing facilities. Since 1998, a TVA specialist has been located on site to help plant personnel develop and implement a comprehensive energy management program. TVA has assisted through a variety of services to significantly reduce the electric demand and energy usage, as well as other utilities such as natural gas and compressed

air usage. Efforts have included lighting and compressed air leak studies, energy audits, electric, natural gas, and compressed air demand monitoring and charting.

TVA's Green Power Switch Generation Partners Program

TVA purchases 100 percent of the renewable energy generated by consumer-installed solar (photovoltaic) and wind systems. As of January 24, 2008, there are 41 active installations with a combined generating capacity of 229.45 kilowatts (kW).

Energy Audits

TVA provides energy audits through a distributor partnership program. This partnership initiative brings TVA engineering and technical resources to C&I customers. The program surveys energy use patterns and recommends energy efficiency improvements in numerous areas, but information is not available on actual implementation.

Demand-Side Management (DSM) Potential

In fiscal year 2002, Pacific Energy Associates (PEA) was contracted by TVA to assess a number of demand-side management (DSM) options that could achieve up to 250 MW of peak demand reduction in a two-year period. The assumptions and findings of this study were applied to the Middle Tennessee area in order to determine load reduction potential in the area. The following table includes the findings of the original study, as well as a percentage applied to the affected service area based on the original assumptions of the study.

| Customers | Assumptions, PEA Study, TVA System-Wide¹ | Actual, Middle Tennessee Service Area² | % TVA Total in Middle Tennessee Area |
|-----------------------|--|--|---|
| Residential Customers | 3,547,242 | 188,410 | 5 |
| C&I <50 kW | 558,749 | 23,012 | 4 |
| C&I >50 kW | 62,796 | 3,477 | 6 |
| C&I >5,000 kW | 476 | 6 | 1 |
| Megawatts | Findings, PEA Study, TVA System-Wide³ | Findings Applied to Middle Tennessee Area⁴ | |
| Average MW | 92 | 5.1 | |
| Peak MW | 187 | 10.5 | |

¹ Source: Total Valley distribution, June 2002; may be slightly higher than numbers reported to PEA

² Source: 2007 Tennessee Valley Public Power Association Membership Directory; data compiled in October 2006 distributor survey

³ Data from actual PEA report fiscal year 2002

⁴ Applied using percentage of actual customers

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