

Integrated Resource Plan

TVA'S ENVIRONMENTAL AND ENERGY FUTURE



TRANSMISSION

TVA owns and operates one of the largest and most reliable transmission systems in North America, serving some nine million residents in an 80,000-square-mile area spanning portions of seven states. TVA's transmission system moves electric power from the generating plants where it is produced to 158 local distributors, 52 directly-served industries and 6 federal customers across the region. In 2008, TVA's system logged its ninth consecutive year of 99.999 percent reliable power delivery. The 15,900 miles of line on the TVA system are enough to span the nation more than five times.

TVA continues to invest in maintenance and expansion of its transmission system to ensure electricity can be supplied from an economic mix of generators located within and without the TVA region. Over the past decade, TVA has added about 1000 miles of new transmission.

Power from renewable generating sources is being built in the US at an unprecedented rate and offers significant challenges to transmission providers, including TVA. These generators must be located near the sources for the power, such as areas with high wind or solar power potential. These areas are typically located outside TVA's service area requiring additional transmission lines to reliably transport this power. In addition, because many renewable sources—such as solar and wind—are intermittent, the transmission system must also be able to accommodate replacement generation when the renewable sources are unavailable.

TVA recently participated in a major transmission study with Regional Transmission Organizations in the Northeast and Midwest and the Southwest Power Pool. The study investigated how the transmission grid would have to be expanded if utilities in the eastern U.S. had to obtain 20% of their electric energy from wind generators in the Midwest. Many new high-voltage transmission lines—both alternating current and direct current—would be needed, with a total cost of about \$80 billion. Other scenarios for renewable energy can be envisioned—including importing coastal wind, tidal or solar power into the region—but all would require new transmission.

Finding suitable sites for new transmission lines is challenging. Urban congestion and development, environmental considerations, aesthetics, land values, competing land uses, electromagnetic fields, etc. can all affect where new transmission lines can be located. One group of technologies that shows potential for meeting many of these challenges is collectively known as "Smart Grid," using digital technologies to create advanced electrical transmission and distribution systems.

An alternative to building new transmission could be a distributed generation system, with hundreds of smaller generators located close to population centers. This option requires energy sources compatible with urban air quality goals and local backup generators to ensure reliable service. Distributed generation would cost more than conventional electric power supply in the TVA region.

You can participate in TVA's integrated resource planning by submitting comments about the scope of transmission and distribution system options you feel TVA should consider when planning for future energy needs. You may submit comments here or on line at www.tva.gov/IRP