The Challenge: Use energy wisely and efficiently, leveraging the research assets of our universities and industry to develop new, clean, and renewable sources that will support, improve and sustain our economy and quality of life.

THE ENERGY PIE: A MULTI-FACETED APPROACH TO LONG-TERM ENERGY PLANNING

Recommendations on how Tennessee can use energy wisely and efficiently, and how to leverage the research assets of our universities and industries to develop new, clean, and renewable energy sources that will support, improve, and sustain our economy and quality of life.

Bill Sansom

Energy is the fuel of our economy. The past year’s soaring fuel costs made this clearer than ever. Higher gas and diesel prices at the pumps made commuting to work and shipping goods to market costlier. Higher coal and natural gas prices led to higher electric bills, which strained business and family budgets alike.

Although fuel prices have moderated, the public and business sectors understand the magnitude of the energy problem much better today than they did before. They understand that long-term energy planning for the state of Tennessee is not a one-solution problem. Effective energy planning is a pie made up of many pieces. In this paper, we discuss the policy needs in the areas of

1) **nuclear power**—continuing its development as a safe, clean, economical source of base-load power;

2) **clean air**—ongoing programs to reduce emissions from coal-burning plants;

3) **renewable energy sources**—including hydro, wind, solar, biomass, waste heat, and bio fuels, notably switchgrass;

4) **energy efficiency, energy conservation, and demand response**—finding innovative technologies and incentives to adjust usage habits—in businesses, homes, and industries—so energy is used more efficiently; and

5) **green industry**—attracting environmentally friendly industries and helping current ones make adjustments to contribute to a sustainable economy.

Nuclear Power

Today, the Tennessee Valley Authority (TVA) gets about 29% of its electricity from its six nuclear units—three at Browns Ferry Nuclear Plant in Athens, Alabama; two at the Sequoyah Nuclear Plant near Chattanooga; and one at the Watts Bar Nuclear Plant in
Spring City, Tennessee, near Knoxville. TVA is building a second unit at Watts Bar that is scheduled to begin operation by 2013. Looking ahead, TVA is exploring options for nuclear units at the Bellefonte site near Hollywood, Alabama. Adding nuclear power one unit at a time a responsible way to meet the Valley’s increased demand for electric power without carbon emissions. As a safe, clean, economical source of base-load electricity, nuclear provides an important part of the answer to environmentally friendly energy planning, in Tennessee and in the nation as a whole.

Some 50 nuclear units are being planned in the Southeast. At present, neither the region nor the nation has anywhere close to enough welders, pipe fitters, electricians, electrical engineers, or nuclear engineers to plan, build, and operate the nuclear units on the drawing boards. As a matter of policy, Tennessee must embark on a dramatic series of initiatives to train the next generation of skilled trades & labor employees and high-tech engineers. This effort must start with the rejuvenation of technical programs in high schools and continue with support for these programs in community colleges and engineering schools.

As a practical matter, it is important that TVA, Oak Ridge National Laboratory (ORNL), and the U.S. Department of Energy (USDOE) successfully complete the development of an effective process for reprocessing and recycling spent nuclear fuel.

Clean Air

TVA gets about 55% of its electricity from its 11 coal-burning plants. TVA is in the midst of an almost $9 billion investment in emission reductions from its fossil plants. In keeping with the Clean Air Act and its amendments, TVA has reduced sulfur dioxide emissions by 82% since 1977 and nitrogen oxide emissions during summer ozone seasons by 81% since 1995. Today, our region’s air is the cleanest it has been in our lifetime.

Coal will continue to be a major component for the Valley’s and the nation’s power portfolio for years to come. However, as the need continues to grow to reduce carbon emissions and reduce our overall environmental footprint, coal will become much less competitive than it is today. Coal will bridge the gap, though, until other, low-carbon emitting sources, such as nuclear and other more traditional renewables, can be developed further.

Renewable Energy Sources

TVA gets 5% to 10% of its power from hydroelectric dams, depending on the amount of water available. TVA, local power companies, ORNL, DOE, and the state of Tennessee are pursuing the development of solar, wind, waste heat, and biomass energy. TVA is also entering into contracts to buy renewable power from independent sources. At the moment, non-hydro renewable power used in the Tennessee Valley totals less than 1%, but as this figure grows, renewables will provide a more significant slice of the energy pie.
Tennessee does not have the constant wind of certain coastal and plains states, nor does it have the intense sunlight of desert areas. Nonetheless, both wind and solar power can contribute to Tennessee’s energy future. TVA currently gets renewable wind power from 18 wind turbines atop Buffalo Mountain in East Tennessee, the largest wind power facility in the Southeast.

Governor Bredesen’s proposal for a solar research institute at the University of Tennessee and ORNL will complement major solar-industry investments in the state and spark innovations in solar power to make them more affordable and competitive with other power production technologies.

Biomass from sources such as switchgrass and wastes produced from the forest products industry also holds great potential in the Southeast. Utilities and the states must look for ways to make biomass a competitive and sustainable feedstock.

**Energy Efficiency, Energy Conservation, and Demand Response**

In recent years, power demand in the Tennessee Valley has grown an average of 2% each year. Rising fuel costs have made it increasingly costly to meet that demand. Although the economic downturn has reduced power demand on the TVA system and elsewhere, this makes it even more important that power suppliers consider their customers’ pocketbooks, as well as their own.

New generation should be only part of the solution for continuing to meet the Valley’s demand for power. Another part of the solution is TVA’s Energy Efficiency & Demand Response (EE&DR) program. Its goal is to work with customers to reduce the growth in peak power demand by up to 1,400 megawatts by 2012. By helping customers use energy smarter, utilities and customers both benefit.

A key element of demand response is to offer incentives, rate structures, and technologies to commercial and industrial customers to shut down operations during hours of peak power demand and reduce energy consumption. Effective demand response can decrease TVA’s need to buy electricity from power markets or to run expensive combustion turbines to provide power for peak demands. To coordinate demand response among smaller businesses, TVA has contracted with EnerNOC, Inc. of Boston, an industry leader in providing demand response and energy solutions.

TVA’s customers have expressed an interest in the future prospects for time-of-use pricing—that is, charging less for off-peak hours when power is cheaper, and more for the peak hours when power is more costly, with a meter indicating to the customer exactly how much the power is costing at a particular hour. If customers can see how much their power is costing them, then they are more likely to find ways to use less electricity and save money. TVA is conducting a pilot project, in partnership with a number of Valley power distributors, to test the practicality of time-of-use pricing for homeowners.

To help homeowners find ways to conserve energy, TVA is offering free home energy audits, of which some 40,000 were completed in 2008. For several years, TVA and the
Oak Ridge National Laboratory have worked together to build Zero-Energy Homes, including ones in Lenoir City, Tennessee, through the Habitat for Humanity program. TVA and ORNL are now developing a next generation of Zero Energy houses with the ZEBRA alliance and are looking at middle-class homes to determine the best ways for homeowners and builders to capitalize on energy efficient technologies available in the market place. One of the keys to efficiency is providing the regulations, tools, and training necessary to consumers, builders, and developers to help them see and understand the benefits of being energy efficient.

TVA has launched programs to develop incentives and low-interest loans for companies wanting to invest in energy efficient technologies and building upgrades. These complement efforts by the State of Tennessee. The Tennessee Clean Energy Future Act of 2009, incorporating recommendations from the Governor’s Task Force on Energy Policy, includes mandates for

- state government to “lead by example” with improved energy management of its buildings and passenger motor vehicle fleet;
- job creation in the clean-energy technology sector by making qualified businesses eligible for Tennessee’s existing emerging industry tax credit;
- and energy efficiency in newly constructed homes through a limited state-wide residential building code and expanded eligibility for federal funds used to “weatherize” existing homes in low-income areas.

I commend Governor Bredesen for the work of the task force and for the introduction of the legislation.

**Green Industry**

TVA’s Strategic Plan, adopted in 2007, states that “TVA will be proactive in addressing environmental concerns, including those related to global climate change.” In May, the TVA Board adopted an Environmental Policy to help TVA reduce its environmental impact while continuing to provide reliable and competitively priced power to the Valley and attracting and retaining good jobs.

In 2008, TVA and its 158 distributor customers, working with state and local partners in the seven-state Tennessee Valley region, helped attract or retain more than 45,000 jobs and leveraged some $4.5 billion in capital investment, including $1 billion that Volkswagen of America is investing in a 1.9-million-square-foot plant near Chattanooga.

In line with its Strategic Plan’s emphasis on sustainability and economic development, TVA, in cooperation with the Tennessee Department of Economic & Community Development, has placed a renewed emphasis on fostering growth in existing companies and in attracting Green Industries. Two such green companies are Wacker Chemie AG of Germany and Hemlock Semiconductor (HSC), based in Hemlock, Michigan.
Wacker is building a $1-billion plant in Charleston, Tennessee, where it will employ 500 workers and manufacture polycrystalline silicon, a material used to make electronics and solar panels.

HSC, a joint venture of Dow Corning and two Japan-based firms, is building a $1.2-billion semiconductor plant on a 1,215-acre site in Clarksville, Tennessee, to serve the needs of the emerging solar technology industry. The plant will bring at least 500 initial jobs and about 1,000 construction jobs to the region.

Moving forward, Tennessee will benefit from TVA, universities, and other federal, state and local entities working together to craft a cohesive plan for environmentally friendly economic growth.
William B. Sansom became the chairman and chief executive officer of the H.T. Hackney Co. in May, 1983. Hackney is a diversified company involved in wholesale grocery, including a bottled water company and a potato chip company, gas and oil, and furniture manufacturing.

Bill is a native of Johnson City and graduated from West High School in Knoxville. After high school, he enlisted in the Marine Corps and then attended The Citadel where he received a degree in Civil Engineering.

He joined American Limestone Company in 1964 as an engineer, then in 1974 served as president of American Limestone until being named as Commissioner of Transportation for the state of Tennessee in 1979. In July of 1981, Sansom was named as Tennessee’s Commissioner of Finance and Administration. In 1983 he left state government to become chairman and chief executive officer of Hackney. Hackney has operations in 10 states with 3800 employees.

Bill has been active in many organizations. He was president of the Knoxville Chamber of Commerce, chairman of the Knoxville Community Development Corporation, president of Tennessee Business Roundtable, president of the Boy Scout’s Great Smoky Mountain Council and served for many years on the board of the Knoxville Zoo. He has served as president of The Citadel Development Foundation and as a board member at Maryville College, Wake Forest University, and The University of Tennessee Board of Trustees for 16 years. He has been on the board of the Oak Ridge National Lab, National-American Wholesale Grocers’ Association and the National Crushed Stone Association.

Bill is currently serving as Chairman of the Tennessee Valley Authority, the nation’s largest public power corporation. He continues to serve on several boards including three public corporations, Astec Industries, First Horizon Corporation, and Mid-America Apartment Communities.

Bill and his wife, Elisabeth, are very active in their community and church, Cedar Springs Presbyterian. They have a daughter, Kathryn, who has four children and lives in Knoxville with her husband, Tommy Eggleston.