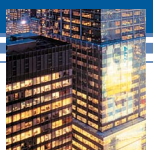
Oak Ridge National Laboratory Reports:

State Energy Program and State, Territory Energy Offices Deliver Annual Energy and Cost Savings



About the State Energy Program

The State Energy Program (SEP) is the only federally funded, state-based program (administered by the U.S. Department of Energy) that provides resources to the states for their deployment in addressing local needs and opportunities. The program, funded at $45 million in FY 2003, is cost-shared by states; many energy initiatives would not be possible without SEP seed funding. As a result of SEP, states spend and invest more than three-and-a-half times as much money on these initiatives. More specifically, every $1 of SEP federal funds is leveraged by $3.54 of state and private funds.

With these resources, the State and Territory Energy Offices develop and manage a variety of programs geared to increase energy efficiency, reduce energy use and costs, develop alternative energy and renewable energy sources, promote environmentally conscious economic development, and reduce reliance on oil produced outside the U.S. Also, State Energy Offices are involved in providing input on state energy policy development, administering public benefits and other state energy funds, and energy emergency preparedness.

The State Energy Program's ultimate goals: To help assure energy reliability, and strengthen America's competitive position and national energy security.

> "The impressive savings and emissions reductions numbers, ratios of savings to funding, and payback periods ... indicate that the State Energy Program is operating effectively and is having a substantial positive impact on the nation's energy situation."
>
> — Oak Ridge National Laboratory
> January 2003

$1 in SEP Funding Yields $7.23 in Annual Energy Cost Savings

To measure the State Energy Program's return on investment, the U.S. Department of Energy asked the Oak Ridge National Laboratory (ORNL) to analyze the energy and cost savings generated by the program, based on data collected in 2001 and 2002. ORNL's report, "Estimating Energy and Cost Savings and Emission Reductions for the State Energy Program Based on Enumeration Indicators Data," represents the most in-depth metrics effort to date on benefits of the State Energy Program.

Total Annual Energy and Cost Savings

Annual energy savings	41,358,478 MMBTUs
Annual cost savings	$256,422,600.00

Total Annual Emission Reductions

Carbon	719,251.8 metric tons
VOCs	127.2 metric tons
NOx	5,739.0 metric tons
PM10	144.8 metric tons
SO_2	7,655.7 metric tons
CO	968.7 metric tons

Key ORNL report findings include these:

- Each $1 of State Energy Program (SEP) funding results in annual energy savings of 1.17 million source BTUs and annual cost savings of $7.23.
- Each $1 of total funding (SEP plus leveraged non-SEP funds) results in annual energy savings of 0.25 million source BTUs and annual cost savings of $1.58, representing a payback period of seven weeks for the SEP portion and eight months for the total investment.
- Each $1 of SEP funding leverages $3.54 from non-federal sources. This estimate is conservative and does not include public benefits funds. As a result, the report indicates, the actual leverage number is likely higher.

The ORNL report quantifies the benefits of 14 program areas, representing about 60% of SEP activities and funds; thus, the report understates the total benefits provided by the State Energy Program. Among the vital activities funded by the states and SEP that are not quantified in the report are essential energy emergency planning and preparedness functions conducted by all State and Territory Energy Offices.

"Had the full monetary value of all non-energy benefits been calculated," the report states, "it is likely that the cost savings numbers ... would have been considerably larger." (Please see page four for additional discussion about this issue.)

Energizing America
11 Examples of the State Energy Program @ Work *(See Inside)*

ENERGIZING AMERICA: The State Energy Program In Action

Alabama Reduces Water Loss, Saves Energy

The production, treatment and distribution of potable water is an energy-intensive process, with electricity accounting for the second-largest cost in delivering water to the tap. The Alabama Energy Office, with the state's Rural Water Association, trains rural water systems operators to conduct leak surveys and take other steps to reduce water loss. Since its inception, the program, funded in part by the State Energy Program (SEP), has saved nearly $9 million in energy costs and prevented the loss of 7.5 billion gallons of drinkable water.

New York "Flexes" Energy-Efficiency Muscles

New York's FlexTech program provides engineering assistance to commercial and industrial users, mainly to make the state's light- and medium-duty manufacturing businesses more competitive. How? By helping businesses improve their processes and productivity, and save energy, which lowers operational costs. With funding from SEP and New York's Energy $mart initiative, FlexTech produces results. FlexTech saves 20,000 mWh of electricity per year, with significant emissions reductions: SO_2 (80 tons per year), NOx (40 tons per year) and CO_2 (30,000 tons per year). At the same time, FlexTech has created over 100 jobs.

Kansas, New Mexico, North Dakota Tap Wind Power's Potential

With its Wind Energy Program, New Mexico has identified the most promising commercial sites to produce clean, affordable electricity. Leveraging less than a half-million dollars of SEP funds and upwards of $90 million in state incentives, New Mexico is on track to reduce its dependency on fossil fuels for power generation; more than 200 MW of wind capacity is scheduled to be available by the end of 2003. North Dakota expects to develop more than 65 MW of wind-generation capacity by year-end 2004, without legislative mandates, renewable portfolio standards or universal systems charges. And a "wind rush" is on in Kansas, where state incentives and deployment efforts have resulted in more than 112 MW installed.

Oregon, Washington, Georgia and Others Encourage Telework, Reduce Emissions

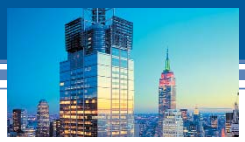
Inspired initially to mitigate traffic and congestion, save gasoline and improve air quality, a multitude of states are now promoting telework, or telecommuting, as a highly effective means of reducing peak load demand for electricity and natural gas, which are required to condition office space. With SEP funding and other state and private funds, states have collaborated to provide training, technical assistance and implementation tools to help private- and public-sector employers develop and maintain telework programs. The results are apparent in at least four states: Commuters in Arizona, Oregon, Texas and Washington are driving 8.5 million fewer miles, saving 283,000 gallons of gasoline and reducing CO_2 emissions by 2,300 tons annually. California and Georgia also are leaders in promoting telework to save energy, reduce employee stress and improve productivity.

Iowa Demonstrates Biomass as Reliable, Emission-Reducing Fuel Source

With its Chariton Valley project, Iowa is demonstrating the effectiveness of biomass fuels to increase the efficiency of and reduce emissions from aging power plants. Leveraging State Energy Program funds, Iowa has encouraged state agencies, private organizations and landowners to develop the biomass energy market. By establishing and managing biomass plantings, Iowans are transforming warm- and cool-season grasses such as switch grass and reed into cash energy crops, representing much-needed economic development for rural communities. By co-firing biomass (with coal) at its Ottumwa Generating Station, the Chariton Valley plant uses less coal and reduces annual emissions by 113 tons of SO_2 and 177,000 tons of CO_2.

Missouri Captures Methane to Realize School Energy Savings, Reduce Emissions

Missouri's Pattonville School District is achieving two key goals with its landfill methane project: Lowering local school heating costs and reducing emissions from flared methane, which naturally results from the decomposition of waste. As a result of a public-private partnership supported by the State Energy Program,



Pattonville converted two natural-gas fueled boilers into methane-powered systems, and encouraged a landfill operator to build a pipeline that captures methane from the landfill and transports it to the school. Conversion of the boilers cost less than $200,000; the school district saves more than $40,000 per year by using less natural gas. The environmental benefit? CO_2 emissions from the landfill are reduced by 981,843 pounds per year.

California Builds New Homes While Minimizing Need for New Power Plants

Through more and better energy-code training for large production home builders in California and Nevada, those fast-growing states have been able to generate new housing while slowing demand for new "peaker" power plants. By training builders and local building department staffs in energy-related construction practices (on insulation, air-conditioning, plumbing, etc.), compliance with California's Residential Building Energy Efficiency Standards (Title 24) has increased from 15 to 77 percent. More than 400 companies have participated, with approximately 125,000 new homes now more energy efficient. SEP funds leveraged by Southern California Edison contributions result in the savings of more than 69 trillion Btus of energy annually.

Hawaii Homeowners Reap $240 Million in Benefits from Solar Power

A public-private partnership in Hawaii deployed $500,000 in SEP seed money to generate a $345-million investment in solar-powered water heaters and other photovoltaic systems. So far, 75,000 solar water heaters have been installed as a result of the initiative, which leverages homeowner investment, utility rebates and state tax credits. Public education, as well as the involvement of the solar and buildings industries and public utilities, has been critical to the success of the program, which has created 1,800 jobs and is saving Hawaiian homeowners $240 million in energy costs.

Facility Commissioning Reduces Texas Capitol's Energy Bill by 27 Percent

Commissioning is designed to optimize a facility's operations to improve building performance, reduce energy use, and address building comfort and indoor air quality problems. Texas in 1995 commissioned the state's Capitol Building Extension, a 360,000-square-foot below-grade facility completed three years earlier. With SEP grant money leveraged by other funds, the commissioning resulted in eight building operating changes affecting heating, ventilation and air-conditioning (HVAC) systems, among others. The improvements reduced the building's energy consumption by 27 percent, for an annualized savings of $144,700. Given the commissioning cost of about $200,000, the payback period was short: only 1.4 years.

West Virginia, North Carolina, Ohio Increase Industrial Competitiveness, Create Jobs

SEP funding enabled West Virginia to assemble a team of engineers focused on the energy technology needs of industry. Working directly with the regional steel industry and Oak Ridge National Laboratory, the team secured funding for a multi-million-dollar cost-shared project to develop improved materials for continuous steel hot-dipping processes. The team also has been responsible for securing support for plant-wide energy assessments for the aluminum and chemical industries. In North Carolina, the state's Energy Management Program provides for energy audits of HVAC, lighting, steam traps and motors in commercial, industrial and government facilities. The program delivers $7.1 million in annual cost savings — $100 million since 1988. Ohio and other states also are working with manufacturers to implement cost-effective efficiency and distributed generation technologies to reduce waste and improve competitiveness.

Florida, Delaware, Michigan, New Hampshire and Others Prepare for Energy Emergencies

Energy emergency preparedness and recovery is a key function of the 56 State and Territory Energy Offices. Good planning by the public and private sectors in advance of fuel supply problems — whether from acts of terror or natural disasters — makes the difference between fast response and crisis in the return of normal service for users of electricity, natural gas, gasoline, propane and heating oil. Availability of energy is vital not only to emergency and public services, but also to assuring the resumption of normal business activity. Energy emergency planning, a nationwide function under the State Energy Program, is apparent in places ranging from Florida and Puerto Rico (where hurricanes can ravage wide areas) to New Hampshire (where winter storms impact heating oil prices) to Iowa and Nebraska (where propane is used for crop drying), and throughout the entire nation, which increasingly relies on natural gas for electricity generation.

State Energy Program Supports Emergency Planning and Preparedness, Other Critical Activities

The Oak Ridge National Laboratory Report quantifies the benefits of 14 program areas, representing about 60% of SEP activities and funds. Among the vital activities funded by the states and SEP that are not quantified in the report are these:

- *Essential energy emergency planning and preparedness functions conducted by all State and Territory Energy Offices.* This includes assisting energy providers and consumers during energy emergencies and natural disasters to mitigate supply disruptions and coordinate state, local and regional responses.

- *Analysis and input on the development of sensible state energy policies and programs.* This includes advising governors and legislators on issues such as electric and gas utility industry restructuring, energy-related business development, codes and standards, and public facilities energy efficiency.

- *Demonstration and development of energy production activities that reduce the demand for fossil-fuel imports by focusing on cultivation of domestic, renewable resources.* This includes alternative fuels programs such as solar, ethanol, bio-diesel and wind energy.

For More Information

For a copy of the complete ORNL report or to learn more about your State Energy Office's activities, please contact the National Association of State Energy Officials (703/299-8800 or info@naseo.org) or visit www.naseo.org.

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