



Office of the State Auditor

Turning up the Heat on Savings

Special Report



Issues, Observations & Recommendations to Improve
the Oversight and Management of
the State Agency Energy Plan

Elizabeth M. Ready
Vermont State Auditor
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Mission Statement

The mission of the State Auditor's Office is to be a catalyst for good government by promoting reliable and accurate financial reporting as well as promoting economy, efficiency and effectiveness in State government.

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Special Report: Issues, Observations & Recommendations to Improve the Oversight
and Management of the State Agency Energy Plan

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Cover Photo: The McFarland State Office Building in Barre, which opened in December 2002 after nearly a year of renovations and work were completed. The building includes many energy efficient and “green” components, from its rooftop to its floors.

Message from the Auditor

Vermont could save between \$1 to \$2.7 million annually if it put in place simple energy conservation measures as outlined in the State Agency Energy Plan (Energy Plan). Our Office examined the State's ongoing efforts to comply with the 10-year-old Energy Plan (3 V.S.A. § 2291) and found that while Vermont has been recognized as a national leader in promoting energy efficiency through Efficiency Vermont, "in house" efforts have fallen well below the bar set by statute.

State government spent \$9,338,888 in Fiscal Year 2003 to heat and power its buildings. The largest component of the State's energy bill is electricity, which, in FY 2003, represented \$5,972,152, or 64 percent, of the State's total energy costs.

If Vermont set its sights on lowering overall energy and fuel consumption by 5 percent, it could save \$466,000 annually. By comparison, many private companies are able to reduce energy costs by 20 to 30 percent through cost-effective conservation steps, according to Efficiency Vermont, the State's energy efficiency utility. At those rates, Vermont could cut between \$1.2 and \$2.7 million from its total energy bill.

Identifying buildings that are "energy hogs," and then quantifying savings from efficiency investments, has been a challenge for the State. That's because despite the best intentions at a number of departments and agencies, very little reliable energy use and cost saving data has been collected since the last major wave of energy efficiency measures were installed nearly 10 years ago.

This past summer marked the 30th anniversary of the 1973 gas crisis that saw long lines of cars at Vermont fuel stations, and awakened many to the fact that the nation needed to rely less on foreign oil and more on regional renewable sources and invest more in conservation measures.

Vermont has become a national leader in finding local solutions to the high cost of energy by promoting energy efficiency as a way to lower the bills that businesses and homeowners pay each month. In fact, the energy efficiency utility created by the State - Efficiency Vermont - received the Innovation in American Government Award from Harvard University's Kennedy School of Government in 2003.

Identifying "energy hogs," and then quantifying savings from efficiency investments, has been a challenge for the State. That's because despite the best intentions at a number of departments and agencies, very little reliable energy use and cost saving data has been collected.

Investments made by companies working with Efficiency Vermont in 2002, for example, will save private companies and homeowners \$26 million over the lifetime of those efficiency measures.¹ It's time that this lucrative private sector model was brought into the culture of State government.

The Vermont Legislature, in 1992, required the creation of the State Agency Energy Plan, which was to be adopted by April 1, 1993 and renewed periodically. This plan put in place a number of requirements for State government to monitor electric and heating fuel consumption and identify ways to conserve energy to reduce those costs.

Our Office's review of this plan found that many departments do not collect necessary data as outlined by the 1993 plan, nor are they required by the Administration to do so.

Specifically, the State Agency Energy Plan says it "shall include appropriate provisions for monitoring energy use and evaluating the impact of measures undertaken."

The Department of Buildings and General Services (BGS) is currently sifting through old budget and expense reports to get a better handle on the amount of money departments spend on energy, as well as reviewing conservation measures and standards. As they opined to our Office, "While State government has done an admirable job at minimizing the growth in its energy consumption, there is always room to improve."

In our report, we found:

- There is no single report that collects State government's total energy consumption and costs, and few departments track this information on their own;
- There is no single person or department in charge of monitoring compliance with the State Agency Energy Plan and implementing improvements; and,
- The State has yet to fully utilize existing, innovative financing mechanisms to accomplish energy efficiency goals.

Saving money through energy conservation is not a new idea in State government. From Governor Richard Snelling in the 1970s during the national oil crisis to Governor Howard Dean during the 1990s, efforts have been made to better identify and understand how energy consumption can drive State budgets, and where the

¹ The Power of Efficient Ideas: Efficiency Vermont Preliminary Report 2002, page 2. The "lifetime" in this equation is 14.5 years, and lifetime economic value is defined as the present value of the electricity, fossil fuels and water that are saved over the lifetime of the efficiency measures.

State can save money and reduce its reliance on foreign oil sources and its emissions of greenhouse gases.

A number of key individuals within various departments, including BGS and the departments of Environmental Conservation and Public Service, are working to reduce Vermont's greenhouse gas emissions and conserve energy. Gov. James Douglas also reiterated Vermont's commitment to reducing energy costs in State buildings through more efficient measures, essentially reaffirming the August 2002 Executive Order signed by then-Gov. Howard Dean.

While these promises and commitments are welcome, more can, and should, be done to ensure that appropriate systems are in place to educate and inform employees, business managers and department heads.

Our Office recommends that:

- The Secretary of Administration should develop an enterprise-wide reporting system to track electric and fuel consumption data as a first step toward analyzing and reducing costs;
- The Secretary of Administration should establish clear goals and standards for all departments of State government to meet the goals outlined by the State Agency Energy Plan, and monitor compliance; and,
- The Secretary of Administration should fully utilize existing financing mechanisms developed and used by the private and non-profit sectors to maximize savings from energy efficiency as envisioned by the State Agency Energy Plan.

Today's business managers need to closely watch how each and every dollar is spent in order to improve the overall efficiency of their department, and be able to determine which of today's investments will accrue long-term savings to the taxpayers, and meet the common goals we share as Vermonters.

Our Office's recommendations are designed to encourage this to happen. This Administration has brought a strong focus on finding efficiency in State government, and this is one area that needs further examination that could benefit from strong action.

Sincerely,



Elizabeth M. Ready
State Auditor
January 12, 2004

Observations & Recommendations

Observation 1

The State cannot easily determine how much money it spends enterprise-wide on heating fuel and electricity for each building it owns or leases, and does not analyze this information regularly to improve energy performance.

Discussion

State government is a large user of energy in Vermont. As part of our Office's special report we asked what the State of Vermont does to track exactly how much it consumes. We observed that few departments analyze energy by kW hour, or gallons by fuel source – though it is possible in VISION to break out these various energy sources by an account code.

Auditors in our Office used VISION to collect statewide spending information by a variety of account codes that pertain to energy, and then further identified which departments are spending the most by category. The account categories we examined were: natural gas, electricity, heating fuel, heating oil no. 1, heating oil no. 2, heating oil no. 6, other energy, wood and propane gas.

Here are the results of our query:

Fuel Source	Amount Spent (FY 2003) by all Departments
Electricity	\$5,972,152
Heating Oil No. 2	\$1,110,916
Natural Gas	\$638,152
Heating Fuel	\$491,054
Heating Oil No. 6	\$467,797
Propane Gas	\$340,383
Wood	\$316,475
Other Energy	\$1,959
Heating Oil No. 1	\$0
Total	\$9,338,888

Our Office further analyzed the results of our VISION query and identified the largest four consumers (in dollars) of energy in each category. On the whole, the Agency of Transportation and the Departments of Buildings and General Services, Corrections and the Military were the top four spenders on energy-related costs in each category.

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A National Model for Energy Savings

While State government must do much more to realize cash savings, many businesses and families are already gaining real benefit through Efficiency Vermont.



The Vermont Public Service Board created Efficiency Vermont - the first statewide efficiency utility in the nation - in 1999.

These homeowners and businesses are now saving money - savings that are expected to total \$66.8 million in 14.5 years - and saving the environment.

Efficiency Vermont has created significant savings per kilowatt hour when compared with the cost of wholesale power production (See Chart, page 8).

Efficiency Vermont provides technical advice, financial assistance, and design guidance to help make Vermont homes and businesses more energy efficient.

This is why in May 2003, Efficiency Vermont received the prestigious Innovations in American Government Award from Harvard University's Kennedy School of Government.

"By creating an independent entity whose sole mission is energy efficiency, Vermont has empowered its citizens to secure their energy future," said Patricia McGinnis, President and CEO of the Council for Excellence in Government, which administers the award in partnership with Harvard. "And this small state is

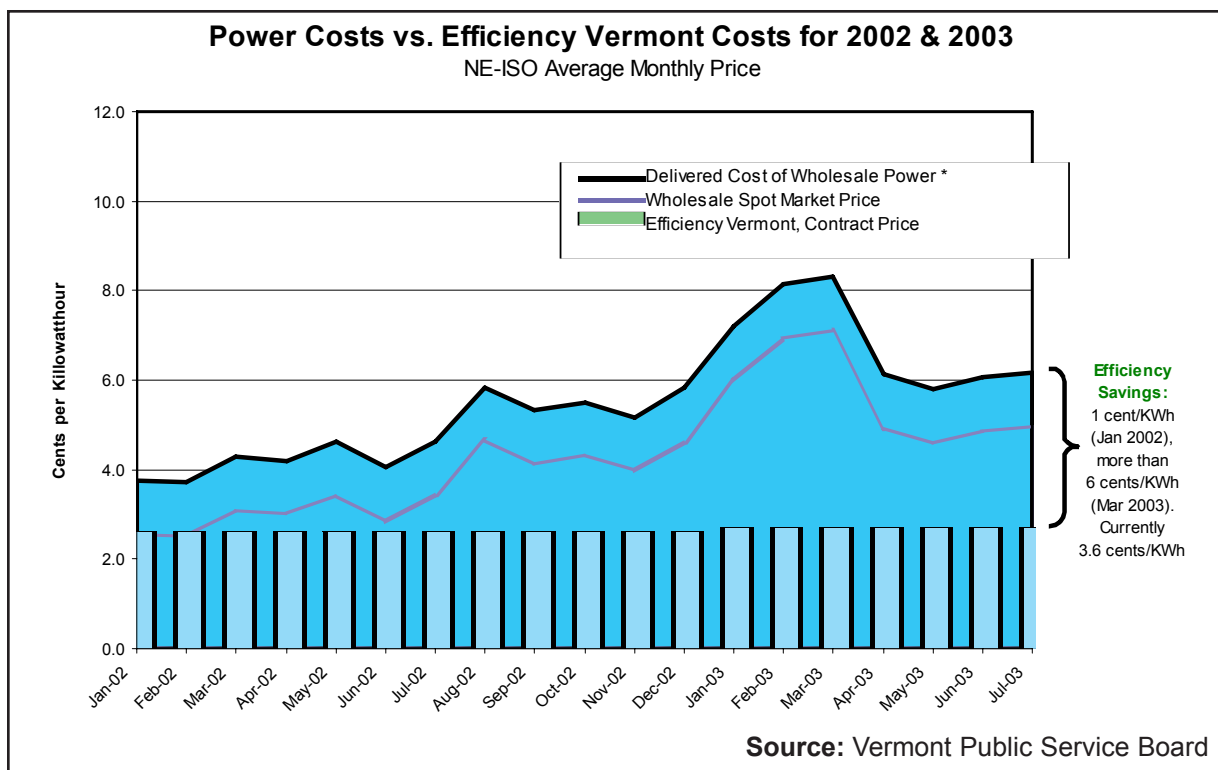
leading the way to a brighter future for those far beyond its borders. Already other states and countries - Maine, Indiana, Brazil - are looking to Efficiency Vermont as a model for cost-effective energy savings."

Efficiency Vermont has helped fuel real cash savings for more than 67,868 businesses and households throughout Vermont since its inception. And, more than 1 million tons of emissions have been eliminated due to decreased energy demands on sources that produce carbon dioxide, nitrous oxides, sulphur dioxide and other contaminants.

Efficiency Vermont and these customers invested \$16.8 million in energy efficiency measures in 2002 (many through Vermont businesses), including lighting, refrigeration, cooking and laundry, air conditioning, ventilation, switching space heat fuels, switching hot water heat fuels, and water conservation.

Businesses are seeing returns of 65 cents on each dollar invested in efficiency measures. At Fairbanks Scales in St. Johnsbury, the company is saving \$50,000 a year from reduced electricity consumption, according to Efficiency Vermont.

For more information about Efficiency Vermont visit www.encyvermont.com.



(Electricity) BGS was the largest consumer of electricity, accounting for 48 percent of the State’s electricity costs in FY 2003, or \$2,878,674. BGS was followed by the Military Department at \$875,592, the Department of Corrections at \$694,229 and the Agency of Transportation at \$687,899.

(Heating Oil No. 2) BGS was the largest consumer at \$397,733, or 36 percent of the total. BGS was followed by the Military Department at \$353,887, the Department of Corrections at \$220,733 and the Agency of Transportation at \$55,075.

(Natural Gas) BGS was the largest consumer at \$276,986, or 43 percent of the total. BGS was followed by the Department of Corrections at \$165,929, the Agency of Transportation at \$69,079 and the Military Department at \$48,453.

(Heating Fuel) In this category, the Vermont Veteran’s Home was the largest consumer at \$187,495 or 38 percent of the total. The Veteran’s Home was followed by the Military Department at \$170,656, the Agency of Transportation at \$47,974 and the Department of Employment and Training at \$23,571.

(Heating Oil No. 6) This category had only one fuel purchaser in State government: BGS.

(Propane Gas) BGS was the largest consumer in this category at \$137,487, or 40 percent of the total. BGS was followed by the Department of Fish & Wildlife at \$103,940, the Military Department at \$30,930, and the Department of Corrections at \$25,719.

(Wood) BGS was the largest consumer in this category at \$184,725, or 58 percent, of the total. BGS was followed by the Department of Forest, Parks and Recreation at \$101,028, the Department of Corrections at \$20,575, and the Military Department at \$9,480.

Spending is only one part of the equation, however. It is clear that energy efficiency plans, based on specious savings estimates, are alone not enough, as was noted by BGS Commissioner Tom Torti in his response to our Office:

“ ... it still takes commitment, the will to do it, and resources. We have a lot to do to prepare for an energy efficient future; a lot of the tools are now in our hands. We have the commitment. We also have the legislative mandates that we must be held responsible for, but we still need the resources to effectively manage the consumption of our energy resources. Successful and responsible energy management is clearly a desirable objective ... We need to improve our energy management, statewide, and we should take this opportunity to do it.”²

BGS told our Office that it was trying to reach back several years to begin compiling historical fuel and electricity use trends in order to identify potentially high-use buildings.³

BGS has direct jurisdiction over roughly one-half of the State's buildings and the energy costs associated with those buildings. As of July 1, 2002 Vermont owned 3,005,807 square feet of operating space throughout Vermont, and leased an additional 474,063 square feet of space, according to *The Space Book 2003*, issued by BGS. These buildings are located in roughly three dozen towns throughout Vermont, as well as a 10,422-square-foot building in Springfield, Massachusetts at the Eastern States Exposition.

The buildings of the Agency of Natural Resources, Agency of Transportation (AOT), Department of Corrections, and Division of Historic Preservation, along with the leased space outlined above, are not under BGS' direct control. However, the Department's Division of Engineering and Construction works with these entities to ensure that any new project under consideration meets the minimum energy efficient building codes, as established in the *2001 Vermont Guidelines for Energy Efficient Commercial Construction*.

However, many of these departments do not collect or regularly monitor energy use other than as a function of ongoing budget management.

² Correspondence from Commissioner of Buildings and General Services Tom Torti to State Auditor Elizabeth M. Ready, August 11, 2003, pages 6-7.

³ Interview with David Burley, Director, Engineering Division of BGS, and Tom Sandretto, Deputy Commissioner, Buildings and General Services, July 15, 2003.

AOT is beginning to pull numbers together to create a comparative baseline of costs, and evaluate how much per square foot the Agency is spending on electricity and heating fuel. In January 2003, AOT began to compile the electrical and heating fuel usage at all the garages to understand what they were using, and if they could identify any inefficiencies. AOT also wanted to know if they were getting any payback for the estimated \$300,000 they were investing annually on energy upgrade projects, such as lighting upgrades and radiant heat installations. AOT wanted to make sure they were using their major maintenance funds as efficiently as possible.

Currently, AOT is looking at monitoring the energy use at 15 different garages throughout the State, ranging in age and the number of repair bays. It is estimated that one option, which would be the installation of meter monitors that would report directly to a central website, would cost about \$9,000 to install and operate for one year.⁴

The Department of Corrections, which spent \$1,142,083 on all energy sources in FY 2003,⁵ does not monitor usage by building in terms of kilowatt hours or gallons of heating fuel as it explains in a response to this Office's request for information related to total energy costs per square foot by building.

*"In some facilities, a building by building monitoring would not be possible as we have one meter or tank for several buildings. However, as our funds are appropriated very tightly, we do monitor the expenditures and scrutinize fluctuations very closely. That said, we do not have an explicit initiative to make our buildings more efficient and doubt that we have the expertise to do so."*⁶

The Big Payback

A key principle behind energy efficiency is that large, upfront conservation investments are "repaid" with savings from lower utility and heating fuel bills down the road, the so-called "payback."

Usually, payback on what are known as "low hanging fruit" projects - or quick-hit savings such as installing more efficient lighting units, computers and occupancy sensors that automatically shut off lights - is three to five years. More capital-intensive projects that involve the installation of cogeneration units, district heating, solar panels,

⁴ "Energy Monitoring at Vtrans Garages," Agency of Transportation, August 1, 2003, page 6.

⁵ This number includes: \$694,229 on electricity, \$220,732 on No. 2 heating fuel, \$165,929 on natural gas, \$25,720 on propane gas, \$20,575 on wood, and \$14,898 on heating fuel. Source: SAO VISION query, October 6, 2003.

⁶ E-mail from Andy Pallito, Department of Corrections, to SAO, September 9, 2003.

weatherization, or more efficient construction materials in a new building are paid back over a longer period, 10-15 years, but at that point have a greater savings on the bottom line.

For example, when the State of Vermont first implemented the State Agency Energy Plan, BGS focused on ways to improve the efficiency in buildings along State Street in Montpelier. This initial investment of roughly \$800,000 (minus nearly \$200,000 in rebates from Green Mountain Power), is estimated to be saving the State about \$60,000 annually on its electricity bills.⁷

More recently, in the design of the Springfield prison the State opted to install a cogeneration facility that allows the State to generate its own electrical and heat supply for the complex. This is expected to save the State more than \$1 million during a 12-year period in reduced energy costs and maintenance.⁸

The combination of not easily determining the current costs the State pays for electricity and fuel oil, and not knowing the payback of these investments, means the State does not know what it is getting for its investments in energy conservation measures.

Recommendation 1

The Secretary of Administration should develop an enterprise-wide reporting system to track electric and fuel consumption data as a first step toward analyzing and reducing costs.

⁷ *Saving Energy in State Buildings: A Report on the Energy Conservation Program of the Vermont Department of State Buildings*, January 6, 1995, page 7.

⁸ Source: Comparative analysis conducted by the Department of Buildings and General Services.

Observation 2

The Secretary of Administration has not established clear goals and standards for the departments of State government as required by 3 V.S.A. § 2291. This has prevented State government from realizing the savings envisioned by the Statute.

Discussion

Act 259 included several provisions that empowered the Secretary of Administration, along with the commissioners of the Departments of Public Service and BGS, to put together a cross-departmental team to ensure broad participation in the State Agency Energy Plan (3 V.S.A. § 2291).⁹

However, the bulk of the work fell on BGS, which worked across departments to identify some of the quick ways in which the State could save money. This occurred mainly through the replacement of light bulbs, the installation of occupancy sensors and other measures. While their hard work should be lauded and commended, it happened purely through the sheer will of a few, dedicated employees rather than through a top-down, system-wide approach of education and integration that would involve many employees in the goals of energy conservation.

BGS, in its response to our Office, notes:

“To date, the State’s energy management has suffered from a lack of coordination. The time may have come to coordinate these activities in a more meaningful way than exists at present. This would require a resource commitment; perhaps the creation of a reconstituted ‘Management Service Committee.’”¹⁰

This lack of coordination has also allowed the State Agency Energy Plan to go without formal review since its initial adoption in 1993, allowing key components of the plan to be left unexamined. By not thoroughly reviewing the plan prior to each reauthorization, the State missed an opportunity to evaluate its data collection, consumption reports and policy revisions.

The Climate Neutral Working Group, created by Executive Order 11-02, was charged with helping to devise statewide policies to help Vermont improve its energy efficiency, from buildings to new vehicle purchases. The Order stated: *“The Department of Buildings and General Services shall work with the Climate Neutral Working Group and all state facilities to ensure that every state building reduces its energy consumption to meet the outlined greenhouse gas emissions.”*

⁹ 3 V.S.A. § 2291(b).

¹⁰ Correspondence from Commissioner of Buildings and General Services Tom Torti to State Auditor Elizabeth M. Ready, August 11, 2003, page 2.

The task to ensure that all state facilities meet the standards appears to be hampered by the lack of statewide data noted earlier. Some departments are only now beginning to collect this data, which includes not just cost but kW hours and energy costs per square foot, and are reaching back into past invoices to create an accurate historical trend.

Recommendation 2a

The Secretary of Administration should establish clear goals and standards for all departments of State government to meet the goals outlined by 3 V.S.A. § 2291.

Recommendation 2b

The Secretary of Administration should revise the State Agency Energy Plan to improve energy efficiency and reduce energy spending, as required by the law, before its re-adoption in 2005, as required by 3 V.S.A. § 2291(b).

Recommendation 2c

The Secretary of Administration should establish specific targets, monitor compliance and provide annual updates during the budget process.

States Find Savings in Sustainability

Many states collect data on energy use and identify energy efficiency opportunities in an annual report to the Legislature, and the public.

For example, Missouri's Division of Energy (located within its Department of Natural Resources) is "required to evaluate, based on life-cycle cost factors and minimum energy efficiency standards, design and construction documents for all new construction or major renovation of any state building when major energy systems are involved. The division and the Office of Administration submit an annual joint report to the House committee on Energy and Environment, and the Governor on the identification, planning and implementation of energy efficiency projects in state buildings."

In Oregon, the Department of Administrative Services was the conduit through which Governor John Kitzhaber enacted an energy conservation plan aimed at immediately reducing State government's energy use by 10 percent, and promoting more long-lasting conservation measures throughout the state. In response, State agencies reduced their electricity by 7.7 percent and their use of natural gas by 2.1 percent, for savings of about \$1.1 million, according to a report by the Oregon Audits Division.

Under Oregon's plan, called the State Sustainability Policy, agency managers are required to monitor building systems for efficiency and review energy consumption patterns, similar to Vermont's State Agency Energy Plan. In Oregon, not all agencies fully monitored or tracked the required information, as the audit in that State found.

Observation 3

The State does not fully utilize existing innovative financing mechanisms developed by the private and non-profit sectors to maximize savings from energy efficiency, as envisioned in 3 V.S.A. § 2291(b)(6).

Discussion

In Act 259, the Legislature called on the administration to revise, or expand, “existing state lending and development programs to create incentives for the development of clean fuels, energy conservation and alternative energy industries.”¹¹ This has not been fully accomplished in State government.

In contrast to the lack of progress by State government, the business and non-profit sectors are teaming up to realize significant savings.

Vermont has, in many ways, led the nation in ways to fund energy conservation programs in the private sector, first through its regulated demand side management programs, which were handled by individual utilities with varying degrees of success. In 1998, the Public Service Board issued a ruling that led to the creation of an Energy Efficiency Utility funded through a line item charge on every electric company customer’s bill.

Investments made by companies working with Efficiency Vermont in 2002, for example, will save private companies and homeowners \$26 million over the lifetime of those efficiency measures.¹²

Meanwhile, State government has seen mixed success within its own walls. Proposals are not always properly funded, and cash-strapped departments have been unable to scrape together enough money to set aside for specific energy projects that save money. Other departments undertake efforts based on an overall conservation ethos, but without a strategic plan. The result is that savings are not realized and the State pays more than it should to heat and light its buildings.

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¹¹ 3 V.S.A. § 2291 (6).

¹² *The Power of Efficient Ideas: Efficiency Vermont Preliminary Report 2002*, page 2. The “lifetime” in this equation is 14.5 years, and lifetime economic value is defined as the present value of the electricity, fossil fuels and water that are saved over the lifetime of the efficiency measures.

Keeping it Green at UVM

Its school colors of green and gold match perfectly with the University of Vermont's energy efficiency program - it's lowering the University's impact on the environment and saving money.

UVM saved \$1.6 million in 2002 by avoiding electricity use thanks to the investments it has made in energy efficiency measures under the leadership of President Dan Fogel.

"This is not only what's best for our bottom line, but it's good for the taxpayers who support the university - and it puts our best foot forward as an institution to show leadership around an issue that UVM takes very seriously. It's part of our culture - from students up to the administration," says Richard Wolbach, UVM's energy management director in the Department of Physical Plant.

UVM achieves these savings by using a variety of financing mechanisms. First, it has an internal \$125,000 revolving fund that its energy services division can access for short-term, quick savings projects. Savings from the project are paid back into the fund to ensure the fund is available for future projects. One such measure was installing vending misers on all of the vending machines on the campus; these items automatically turn off vending machine lights when there is no one near them.

UVM ensures that a portion of each major bond for larger investments includes an energy efficiency investment component. This has amounted to roughly \$1-\$2 million each issuance. With each bond, Wolbach develops a



life-cycle savings spreadsheet to annually track not only the amount UVM pays in bond costs to fund the conservation measures, but project savings and pay-back.

UVM's plans for the future includes real-time metering of steam, water and electricity through the campus-wide ethernet computer system. This would allow UVM to receive real-time information about energy use to catch problems as they happen. UVM is also looking to purchase and stock only one kind of light bulb to ensure that only the most efficient bulbs are installed throughout campus.

UVM works closely with the architect and city officials to take advantage of any method they can to save money.

"We work closely with internal architects and project engineers and material managers," says Wolbach. "You have to work together to be successful. It's a must. Otherwise, you lose savings and investments, and we have a responsibility to the public to do not only what's best for the environment, but what makes economic sense."

BGS, in its August response to our Office's June request for information, said:

*"Energy measurements and the resulting management derived from measurements are, or have been, extremely labor intensive and more recently, without an appropriation, prohibitively costly if 'outsourced.' Success was and continues to be achieved through application of the energy conservation and efficiency guidelines mandated by the legislature and the BGS in-house mandates to build 'efficiently.' In addition, more recent developments with facility management software and other computerized innovations such as direct digital control (DDC) systems and even website monitoring programs such as offered by Circadian, are changing the energy management landscape dramatically from what was existent in the early 1990s to the late 1990s. We are finally gaining considerable momentum with the advent of these new computerized systems, the change in attitude of our maintenance staff as well as our professional staff both educationally and in specific training programs, and the change in culture with respect to our desire and awareness of the social and economic benefits of energy efficiency and conservation."*¹³

A recent trend in funding energy-efficiency projects is the *energy service companies*, or "ESCO," concept.

During the 1997-1998 legislative session, BGS was authorized to *"enter into multi-year contracts with energy service companies for energy efficiency and fuel switching improvements to state facilities, the cost of which will be covered through the avoided fuel, utility, operating and maintenance costs from the improvements."*¹⁴

ESCOs typically offer feasibility analysis, engineering, construction, and financing services required for implementing an externally financed energy efficiency project. An ESCO guarantees certain predicted savings and results, and does not get paid unless it delivers on those results. This is called performance contracting.

¹³ Correspondence from Commissioner of Buildings and General Services Tom Torti to State Auditor Elizabeth M. Ready, August 11, 2003, page 6.

¹⁴ Sec. 41. Sec. 1(d) of Act No. 185 of the Acts of 1995 (Adjourned Session) is amended to read: "(d) The commissioner of state buildings is authorized to enter into multi-year contracts with energy service companies for energy efficiency and fuel switching improvements to state facilities, the cost of which will be recovered through the avoided fuel, utility, operating and maintenance costs resulting from the improvements. Improvements must within ~~*[five]*~~ ten years achieve savings sufficient to cover their costs. The total cost of all improvements undertaken pursuant to this subsection shall not exceed \$1,000,000. All contracts shall be approved by the emergency board. The commissioner shall report ~~*[by January 15, 1997]*~~ annually to the house and senate institutions committees on the status of contracts undertaken under this subsection."

However, BGS, in its annual report on this authorization, noted that no contracts were originated in 1998. However, it noted, “*Our Department and the Vermont State Colleges did seriously entertain the idea of doing a couple of large energy retrofits utilizing an ‘ESCO,’ however the paybacks were too long. Even though we have not utilized this authorization during the past two years it has been in effect, we believe there is merit in keeping this funding option open to us.*”¹⁵

BGS did examine using such an approach with the State office building planned for Bennington. However, the Legislature failed to endorse the funding mechanism because the payback period was too long, BGS said.

The State found an upfront cost to install \$318,000 in efficiency measures would have paid for itself in 10 years. At the end of 30 years, the project would have netted the State more than \$780,000.

BGS’ Division of Engineering and Construction found that an upfront cost to install \$318,000 in efficiency measures would have paid for itself in 10 years, and would have netted the State \$35,000. At the end of 30 years, the project would have netted the State more than \$780,000, with annual savings of roughly \$95,000.¹⁶

In August 2003, BGS received approval from the State’s Emergency Board to enter into an ESCO contract with Efficiency Vermont to install efficiency measures in the Bennington office building. This allows the State to establish a lease-finance agreement on the full package of energy efficiency incentives and measures, placing the performance burden of these measures on Efficiency Vermont rather than the State. This means that Efficiency Vermont assumes a risk to ensure that these investments will return savings to the State, or they don’t get paid for their work. The building is to be completed in 2005.

BGS has examined other ways of saving money, by taking advantage of programs offered by various utilities and energy service providers.

¹⁵ Correspondence from Commissioner of Buildings and General Services Tom Torti to State Auditor Elizabeth M. Ready, August 11, 2003, page 2.

¹⁶ Request for Proposals for Energy Service Company at Bennington Downtown State Office Building issued by the Department of Buildings and General Services, August 1, 2003, Exhibit 5.

Efficiency Vermont covers nearly all of the incremental first costs associated with more costly energy efficient equipment by offering rebates to customers. The State has used this program to install energy misers on all vending machines located on State property. These misers use motion sensors to turn on and off the internal lights on vending machines. The State has not taken advantage of more comprehensive investments that would result in greater savings.

With Green Mountain Power, BGS has a “dispatchable power agreement” for the State’s Waterbury Complex. This allows the State to essentially pay zero demand charge, and it gives GMP the ability to redirect power used at the Complex during off-hours to other customers.

Recommendation 3

The Secretary of Administration should fully utilize existing financing mechanisms developed and used by the private and non-profit sectors to maximize savings from energy efficiency as envisioned by 3 V.S.A. § 2291(b)(6).

Options to consider include:

- Make greater use of BGS authority to contract with ESCOs to fund energy efficiency measures;*
- Create a revolving fund at BGS to pay for efficiency items that provide a quick payback. This fund could be capitalized through Legislative appropriation, capital funds, a portion of the fee for space program, or through savings associated with ESCO projects; and,*
- Utilize the services of Efficiency Vermont, which the State of Vermont funds, in part, each time it pays a utility bill, to identify efficiency conservation measures, and capitalize on energy savings opportunities within State government.*

Background

In 1992, the Legislature approved, and the Governor signed into law, Act 259, which established an effort to improve energy conservation in State government with real, measurable targets.

The Act, which required the development and implementation of a State Agency Energy Plan, was envisioned with four goals in mind that would be carried out through the Plan:

- Security;
- Affordability;
- Environmental impacts; and,
- Efficiency.

The law created “a framework in which you can look at energy choices and begin to assess what are the other relevant and relative impacts of those decisions are, so that they aren’t all just flying in unmeasured or unranked as a part of an argument either for or against a particular measure,” said State Senator Scudder Parker, D-Washington, during introductory testimony on the legislation.¹⁷

After passage of Act 259 the Department of Buildings and General Services spearheaded the installation of more efficient light fixtures, as well as other measures, to lower the State’s utility costs – mainly in the Capital Complex. Since 1997, however, less was accomplished, in part, because the Legislature did not fund requests by BGS to reach the so-called “low hanging fruit,” or easily identifiable measures that have pay-back periods of less than five years.¹⁸

Aside from the development of the State Agency Energy Plan, the State has undertaken other conservation efforts in the past 25 years to reduce energy use, and save taxpayer dollars.

In 1977, Gov. Richard Snelling’s Cost Control Council highlighted energy conservation as one of its 294 recommendations to help reduce government spending without compromising services.

¹⁷ From the introduction of S. 109 to the House Natural Resources Committee by State Senator Scudder Parker, D-Washington. S. 109 was enacted into law as Act 259.

¹⁸ Correspondence from Commissioner of Buildings and General Services Tom Torti to State Auditor Elizabeth M. Ready, August 11, 2003, page 2.

The Cost Control Council's recommendation No. 95, "Ensure continued conformance to the state's energy conservation program," read:

"Figures on the buildings controlled by the Division of State Buildings indicate that electrical and fuel consumption increased by approximately 3% during fiscal 1976. During the previous two fiscal years, reductions of 15% were achieved. The first eight months of fiscal 1977 show an increase of 8.6% in electrical consumption over fiscal 1976 for three major buildings in the Montpelier complex. It appears that the energy conservation program developed by the state needs reemphasis. Typical conservation measures include lowering thermostat settings, shutting down nonessential equipment and making cost-justified capital improvements to conserve energy.

Management personnel at all levels, including the Executive Office, should take steps to stimulate interest in energy conservation. A reduction goal of 3% should be set for fiscal 1978 for fuel and electricity expenses. Prompt, effective action could reduce this state's expenditures by \$100,000. However, no savings has been claimed."¹⁹

On October 23, 1989, Gov. Madeleine Kunin signed Executive Order 79, which called for Vermont's first comprehensive energy plan to be developed by the Department of Public Service. The plan was envisioned as a comprehensive review of all forms of energy use in order to achieve goals related to environmental quality, affordability and renewability.

In 1994, Gov. Howard Dean created the Clean State Council to help the State in the areas of pollution prevention, source reduction and recycling. The Council was charged with finding ways the State could improve on purchasing "green" items, and implement a recycling program, as well as find ways to educate employees about pollution prevention and identify other areas of need. Between 1995-2000, the dates of the last available annual reports generated by the Council, the group estimates that recycling alone saved the State nearly \$1 million in landfill tipping fees. This amount includes income generated from the sale of the State's recycled material.

Then, on August 22, 2002, Gov. Howard Dean signed Executive Order 11-02, which created the Climate Neutral Working Group within State government as part of a regional climate response to combat global warming.

¹⁹ Governor's Cost Control Council – 1977 Survey and Recommendations, July 1977, pages 46-47.

The Order reads:

“Vermont’s goal is to reduce emissions by an amount consistent with the recommendations of the Conference of the New England Governors and Eastern Canadian Premiers Climate Change Action Plan (the “Conference”). The goals established by the Conference are to reduce region-wide greenhouse gas emissions from the 1990 baseline by: twenty-five percent by 2012; fifty percent by 2028; and, if practicable using reasonable efforts, seventy-five percent by 2050.”

Rooftop Recovery

On top of the McFarland State Office building in Barre sit three heat recovery units (HRUs) that recycle escaping exhaust air from the building.

A heat wheel (shown right) inside the HRU is about five feet in diameter and about six inches thick, and looks a lot like a giant honeycomb. As the wheel slowly turns it mixes the outgoing hot air with the incoming cold air in order to save the amount of energy needed to heat the air inside the building. For example, on a December day when the outside temperature was 16 degrees, the outgoing air was almost 73 degrees. When mixed together, the incoming air mixture’s temperature was raised to nearly 62 degrees before it hit the heating system. This meant that the boiler system needed to run at only a third of its capacity in order to keep the inside of the building temperate.



Purpose, Authority, Scope & Methodology

PURPOSE

The Office of the State Auditor has produced this special report on how State departments and agencies are complying with the State Agency Energy Plan (3 V.S.A. § 2291). This report was prepared with a goal of providing compliance and performance information to help meet the demand for a more responsive and cost-effective government.

AUTHORITY

This review was conducted pursuant to the State Auditor's authority outlined in 32 V.S.A. §§ 163 and 167.

SCOPE & METHODOLOGY

The scope of the report included an evaluation of the State's laws, policies and procedures in place to comply with the State Agency Energy Plan. Staff from the Auditor's Office reviewed various energy consumption data, utility bills, and internal policies, and conducted interviews with State employees and managers who are responsible for carrying out aspects of the Plan in their respective department or agency.

This report is not an audit conducted in accordance with applicable professional standards. The purpose of an audit is to express an opinion. The purpose of a special report is to identify observations related to a particular issue or program, and to make recommendations so that the relevant agencies or departments can better accomplish their mission and more fully comply with laws, regulations, or grant requirements. This special report relied upon representations of, and information provided by a variety of State employees as well as upon discussions with building managers, accounting personnel, energy managers and others knowledgeable about the industry.

Appendix A

DEPARTMENT OF BUILDINGS AND GENERAL SERVICES

OFFICE OF THE COMMISSIONER

TO: Hon. Elizabeth Ready, State Auditor of Accounts

FROM: Thomas W. Torti, Commissioner

DATE: 12/19/2003

RE: Response to "Issues, Observations and Recommendations to Improve Compliance with the State Agency Energy Plan"

Thank you for the opportunity to respond to your Draft. As I noted in previous communications it is heartening to see your office and the administration really looking at similar issues with the goal being to improve value for Vermonters. As with your fleet analysis, this Report highlights another area where we share a common vision. I'll address each Observation and Recommendation separately.

Observation 1: We believe that we can determine total expenditures fairly easily by making a query of the Vision system but agree that absent a goal or benchmark the aggregate dollar amounts hold little meaning. Even a year-to-year actual dollar change says little since the cost of all fuels fluctuates regularly.

We agree that it takes a real commitment from the top to change past practices. The governor has been very direct about his plans for energy efficiency, climate change and lower overall energy consumption. A review by your office in a year or so of this administration's work will produce a much different observation.

Recommendation 1: We agree and are in the process of setting up a system that will track usage, regardless of which department has jurisdiction over the facility, and which will set clear performance benchmarks.

Observation 2: We would like to point out for the record that the current Secretary of Administration has taken a very aggressive posture in pointing state government in the direction outlined in 3 V.S.A. 2291. Prior to those standards and goals being set, however, it is necessary for background data analysis to be completed. That work is all but completed.

Recommendations 2-2b: We concur and are in process.

Observation 3: We have a subtle difference with your Report on this item. We believe that we fully utilize what is available to us on a project-specific basis. Also, some legislative limitations placed on ESCO paybacks have made them financially untenable. You are correct and we appreciate that you have taken note of many of the innovative projects that we undertook alone or with the private sector. We have been constrained, at times, by a lack of funding, even to pursue options.

With that said, this administration has directed state government to make the inclusion of energy efficient technology a keystone element in the design, construction and renovation of state capital projects. With the emphasis coming from the top, our efforts at reaching out to others both in the public and private sectors will be redoubled.

Recommendation 3: We agree with your first two bullet points. However, while we use Efficiency Vermont to a considerable degree, they may not be the best vendor to provide this type of service. We have contracted with other vendors who specialize in this field in the past and will likely continue to do so. We have found that it sometimes better to work with individuals or companies that have a single focus on particularly certain types of issues. However, as you know, our relationship with EV is excellent and growing. As their portfolio of services expands, we will certainly have an ever-increasing reliance on them.

Appendix B

State Agency Energy Plan

3 V.S.A. § 2291. State agency energy plan

(a) For purposes of this section, “life cycle costs” mean the present value purchase price of an item, plus the replacement cost, plus or minus the salvage value, plus the present value of operation and maintenance costs, plus the energy and environmental externalities’ costs or benefits. Where reliable data enables the agency of natural resources to establish these additional environmental externalities’ costs or benefits with respect to a particular purchasing decision or category of purchasing decisions, that is energy related, the agency may recommend the addition or subtraction of an additional price factor. Any appropriate agency may make such an adjustment.

(b) The secretary of administration with the cooperation of the commissioners of the department of public service and the department of buildings and general services shall develop and oversee the implementation of a state agency energy plan for state government. The plan shall be adopted by April 1, 1993, modified as necessary, and readopted by the secretary on or before April 1, of each fifth year subsequent to 1995. The plan shall accomplish the following objectives and requirements:

(1) The intent of the plan is to save energy. The plan shall devise strategies to identify to the greatest extent feasible, all opportunities for, and investments in, renewable energy and energy efficiency available to the state which are cost effective on a life cycle cost basis.

(A) The secretary of administration, by means of procedures, shall develop life cycle cost guidelines for use in state buildings. These guidelines shall require all new construction and major renovations to comply with the document titled “State of Vermont, 1991, Department of Buildings and General Services Energy Conservation Standard for New and Existing State Buildings,” as that document may be amended.

(B) The plan shall include consideration of state policies and operations which affect energy use.

(2) The plan shall devise a strategy to acquire all identified opportunities and investments in as prompt, prudent and efficient a manner as possible.

(A) The department of buildings and general services in consultation with the department of public service shall develop a work plan to reduce overall energy consumption in existing and proposed state buildings based on energy consumption levels specified in the energy conservation standard as referred to in subdivision (1)(A) of this subsection. The plan shall identify, in buildings at variance with the energy standards referred to in subdivision (1)(A) of this subsection, the cost to bring the building into compliance, and energy cost savings for the remaining useful life of the building.

(B) The plan shall include appropriate provisions for monitoring energy use and evaluating the impact of measures undertaken.

(C) The plan shall identify education, management, and relevant policy changes that are a part of the implementation strategy.

(D) The department of buildings and general services shall coordinate state purchasing decisions, according to procedures developed by the secretary in cooperation with the commissioner of public service, so as to assure comparisons in terms of relative life cycle costs.

(3) In annual budget and capital requests to the general assembly, the secretary of administration shall include work plans, budgets and proposed financing mechanisms to accomplish these reductions in energy use. Copies of those portions of budget and capital requests necessary to accomplish these reductions in energy use shall be sent to the chairs of legislative committees on institutions and on natural resources and energy.

(4) The plan shall devise a strategy to reduce vehicle fuel consumption. The plan shall include steps to encourage more efficient trip planning, to reduce the average fuel consumption of the agency fleet, and to encourage car pooling and van pooling for agency employees for commuting and job-related travel. The agency of transportation, together with the agency of natural resources, shall jointly prepare a feasibility report by September 1, 1993, for a state vehicle alternative fuel pilot program. This program shall be implemented, as soon as practicable, if cost effective.

(5) Each state agency and department, designated by the secretary of administration, which constructs or manages state buildings shall, by December 31, 1993, assure that new construction or major renovation of such structures incorporates those practical energy efficiency measures and energy consuming systems that result in the lowest life cycle cost. New construction of state buildings shall be highly efficient and shall employ optimal siting and design, given the uses to which the buildings are to be put, with respect to solar gain and temperature control. State buildings shall be shaded and ventilated and their air circulation managed, to the extent practical, instead of being cooled by air conditioning.

(6) The plan shall recommend revisions to, or expansion of, existing state lending and development programs that would create incentives for the development of clean fuels, energy conservation, and alternative energy industries. (Added 1991, No. 259 (Adj. Sess.), § 3; 1995, No. 148 (Adj. Sess.), § 4(a), eff. May 6, 1996; No. 148 (Adj. Sess.), § 4(c)(1), eff. May 6, 1996; No. 178 (Adj. Sess.), § 299.)

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