ENERGY MANAGEMENT BY STATE GOVERNMENT

Connecticut

General Assembly

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LEGISLATIVE
PROGRAM REVIEW
AND
INVESTIGATIONS
COMMITTEE

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CONNECTICUT GENERAL ASSEMBLY
LEGISLATIVE PROGRAM REVIEW AND INVESTIGATIONS COMMITTEE

The Legislative Program Review and Investigations Committee is a joint, bipartisan, statutory committee of the Connecticut General Assembly. It was established in 1972 to evaluate the efficiency, effectiveness, and statutory compliance of selected state agencies and programs, recommending remedies where needed. In 1975, the General Assembly expanded the committee's function to include investigations, and during the 1977 session added responsibility for "sunset" (automatic program termination) performance reviews. The committee was given authority to raise and report bills in 1985.

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LEGISLATIVE PROGRAM REVIEW
& INVESTIGATIONS COMMITTEE

Energy Management By State Government

OCTOBER 2002

Digest
Energy Management by State Government

INTRODUCTION

FINDINGS

The state's energy management efforts are complicated by the multiple goals government is asked to achieve. (pg. 1)

ENERGY CONSUMPTION PROFILE

FINDINGS

In FY 02, the state of Connecticut spent $98 million on energy-related items for government operations, representing about 1 percent of the state's total budget. (pg. 3)

- In recent years, energy consumption by state government facilities totaled 6 trillion Btu annually.
- The state of Connecticut has taken steps to reduce its energy consumption using a combination of conservation and efficiency measures.

STATE ENERGY SAVINGS

FINDINGS

No comprehensive compilation of the state's energy efficiency investments exists, and savings estimates can be imprecise. (pg. 8)

- It appears energy efficiency measures undertaken for state of Connecticut properties between 1990 and 2001 included:
  - at least $48.5 million for electricity-related projects, resulting in estimated lifetime savings of 2 billion kWh and $153 million; and
  - $1.6 million for projects involving natural gas, producing estimated lifetime monetary savings of $3 million.

The money to pay for state energy-related initiatives came from multiple sources -- state bond funds, utility ratepayers, the federal government, and oil companies. (pg. 8)

STATE ENERGY POLICIES AND PROGRAMS

FINDINGS

Elements of a comprehensive program targeting energy conservation and the use of multiple fuel sources by state government already exist in statute, but full implementation is not occurring. (pg. 11)

Existing statutes should be revised to eliminate out-of-date and completed tasks as well as requirements where the cost of enforcement considerably outweighs the consequences of a violation, and to increase consideration of energy-related issues during the budget process. (pg. 15)

RECOMMENDATIONS

The program review committee recommends the following statutory changes related to state energy management activities:

- **amend Sec. 16a-35m to replace the requirement for a comprehensive energy plan prepared every four years with a biennial report on the energy situation in Connecticut, including any unique issues facing state government as an energy consumer;**
- **repeal Sec. 16a-36 re minimum temperature setting of 78° for artificial cooling of state buildings because enforcement is impractical;**
- **repeal Sec. 16a-36a re maximum temperature setting of 65° for artificial heating of state buildings because enforcement is impractical;**
- **repeal Sec. 16a-37d and Sec. 16a-37e to eliminate a program aimed at improving energy performance in state buildings that has been superseded by new programs;**
- **repeal subsection c of Sec. 16a-37u requiring the connection of state buildings to a district heating/cooling system because all feasible connections have been made;**
- **amend Sec. 16a-38a to replace detailed requirements for energy audits of all state-owned buildings (in subsection a) and an out-of-date schedule for retrofit projects (in subsection b) with provisions for an on-going process to evaluate the energy requirements and retrofit opportunities of individual state buildings periodically but at a minimum prior to any major renovation;**
- **transfer subsection c of Sec. 16a-38a regarding energy performance preferences in leased space to Sec. 16a-38h to combine energy-related requirements involving leased space;**
- **amend Sec. 16a-38i to require the Department of Public Works to establish a standardized process for calculating annual average energy use based on the state buildings under its control and give the Office of Policy and Management (OPM) responsibility for implementing the system statewide in conjunction with its energy use and cost monitoring duties under subsection a of Sec. 16a-37u; and**
- **amend Sec. 16a-39b to replace the task force on conserving energy in state buildings with a requirement for periodic meetings of the personnel responsible for energy management at the state's largest energy consuming agencies to discuss opportunities for savings.**

The program review committee also recommends:

- **each state agency be required to include as part of its biennial budget, the total dollars requested for energy within the budget, its plans for energy conservation in the coming biennium, and the progress the department has made in the prior biennial period in energy conservation;**
- **the Office of Policy and Management be required to ask all state agencies to report on how each agency can reduce energy costs and provide that information as part of a joint public hearing before the Appropriations, Energy and Technology, and Program Review and Investigations Committees; and**
- **the Office of Policy and Management be required to report on agency compliance with life-cycle cost analysis requirements.**

The program review committee recommends setting a new construction standard for state-owned buildings equal to or greater than accepted national standards for energy conservation in new construction.

PROGRAM ADMINISTRATION

FINDINGS

Currently, no single entity is responsible for the management or coordination of all energy-related tasks on behalf of the state of Connecticut. Nor, in recent years has any state entity sought a leadership role regarding energy management. (pg. 17)

Based on existing language, the Office of Policy and Management is expected to be the principal agency guiding and implementing state energy policy. In practice, OPM does not have a high-profile in the energy area, and it routinely performs only a portion of the energy-related activities statutorily assigned to it. (pg. 17)

For the present time, OPM should remain the primary entity for coordinating state energy management efforts, but it must take on a more visible and vocal role regarding opportunities for energy conservation within the state. (pg. 18)

RECOMMENDATIONS

The program review committee recommends the Office of Policy and Management take steps to increase its influence over state energy management practices and elevate its public presence regarding energy issues. At a minimum, OPM should identify basic energy conservation practices individual state agencies will be expected to adopt, and it should promote the incentive program established under C.G.S. Sec. 16a-37c. It also should provide more information to state employees about opportunities for energy savings.

The program review committee recommends the Connecticut Energy Advisory Board do an analysis of what would be the appropriate state entity to have responsibility for oversight of state energy policy.

The program review committee recommends the Office of Policy and Management and the Department of Public Works pursue new energy performance contract efforts in order to have at least one pilot project in place by July 1, 2003. The agencies shall report on the results of the contract program to the committees of cognizance for appropriations and energy annually for the life of the contract.

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Introduction

The concept of energy management reflects a combination of actions. It involves avoiding the use of energy when possible (without curtailing essential services) and using less energy to achieve the same or greater output.

The state's energy management efforts are complicated by the multiple goals government is asked to achieve. Unlike a typical consumer focused on attaining the greatest return at the lowest cost, the state also may find itself in the role of nurturer of new ideas (including occasional test subject) and supporter of those who need assistance to pay for essentials such as electricity. These conflicting roles make it difficult for the state to pursue a single, consistent energy plan.

At the same time, the state currently lacks a visible agency or person to guide the various energy-related efforts underway. Although many of the same coordinating staff and facility managers have been implementing state energy programs for years, the level of attention and priority given to energy issues within state government has declined since the late 1970s.

In 2001, the Legislative Program Review and Investigations Committee undertook two reviews of energy-related issues. Early in the year, the committee authorized a study of energy management by state government. Of particular interest were the state's efforts to manage demand for energy, use alternative and renewable sources of fuel, and procure energy supplies efficiently.

In August 2001, the committee voted to temporarily set aside the management study to look at the broader question of energy supply and demand in Connecticut, focusing on the factors that affect the availability of energy for all energy consumers. Upon completion of that study in February 2002, the program review committee resumed study of state government's own energy-related activities.

One of the key recommendations in the energy availability study called for state government to serve as a model energy consumer. Building on that idea, in the current study the program review committee's recommendations seek to:

- clarify statutory language regarding agency responsibilities;
- monitor more closely the energy-related activities of individual state agencies;
- examine further the role of the Office of Policy and Management (OPM) concerning state energy policy; and
- encourage a pilot program involving an approach not previously used by the state.

In this period of fiscal constraint, the program review committee believes it is important the state continue its energy efficiency efforts. While large amounts of new money may not be available for state energy projects, taking steps to reduce energy consumption and operating expenditures represents an investment that will produce future savings for the state.

Such efforts also enhance quality of life for current and future generations in Connecticut who benefit when energy resources are depleted more slowly and emissions released during the production and consumption of fuel are reduced. In addition, because state government operates a diverse range of residential and commercial facilities, its energy-related actions can provide valuable information that may encourage others to change their behavior.

Report Format

The report contains four chapters. The first presents an energy consumption profile of state government from the mid-1990s through state FY 02. The second chapter summarizes major energy conservation efforts in the 1990s and the estimated savings. Chapter Three describes in more detail the state's energy-related policies and programs, including the extent to which implementation has occurred. Chapter Four discusses the roles of various governmental entities with respect to coordination and control of the state's energy management activities.

Appendices A, B, and C describe state efforts to establish an energy consumption monitoring database, an interval metering system, and group purchasing pools for utility services. Appendix D assesses state agency compliance with legislatively mandated energy functions, and Appendix E summarizes the major energy-related duties of various state agencies.

Agency Response

It is the policy of the Legislative Program Review and Investigations Committee to provide agencies subject to a study with an opportunity to review and comment on the recommendations prior to publication of the final report. Appendix F contains the responses from the commissioner of public works, and the Connecticut Energy Advisory Board (CEAB).

Chapter One

Energy Consumption Profile

The State of Connecticut uses energy for heating, cooling, lighting, and the operation of equipment including motor vehicles. It routinely purchases:

- electricity;
- natural gas;
- several types of heating oil;
- diesel;
- propane; and
- gasoline.

A few state agencies also use alternative fuel sources (e.g., solar panels and fuel cells), and a number of facilities in the Hartford area participate in a district heating and cooling system. A couple of state agencies have on-site generating capabilities.

There is no single source of information on the total amount of energy consumed by the state and the total dollars spent annually on energy.

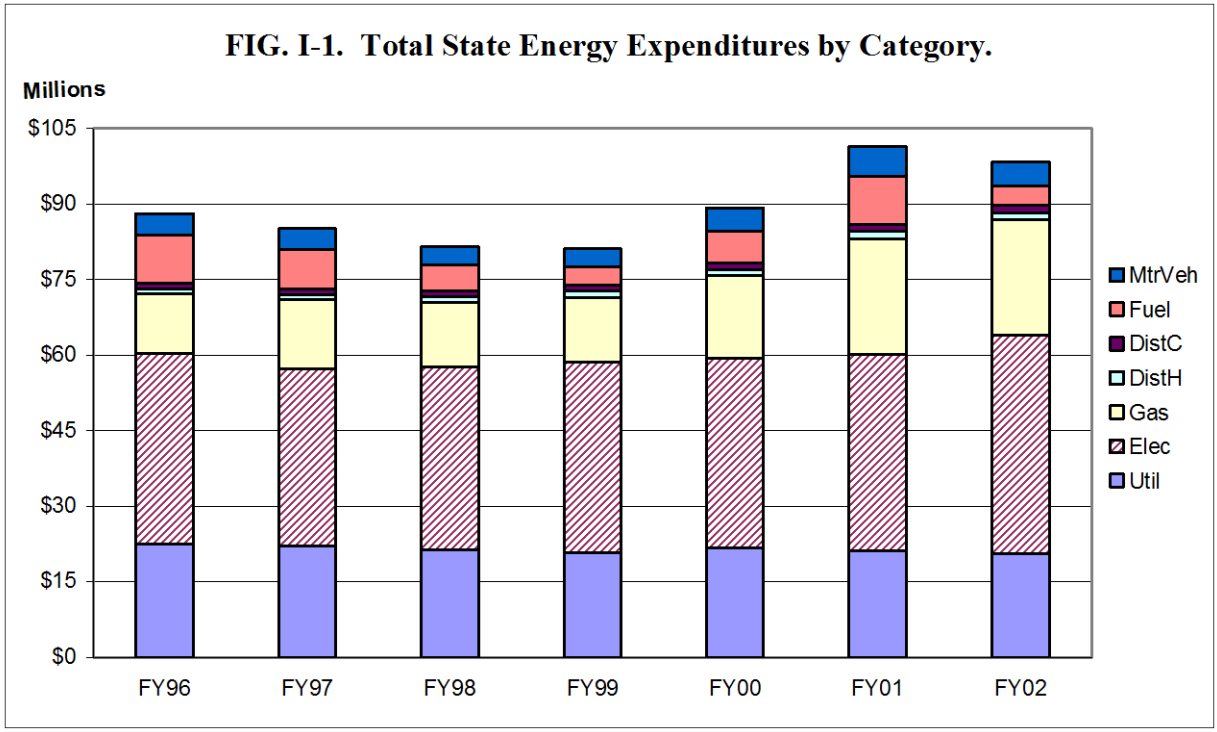
Several entities compile information about state government energy consumption levels and expenditures, but each collects the data differently. The major information sources are:

Comptroller	expenditures for categories of utilities and fuels
Office of Policy and Management	quantities and expenditures for facilities only
Department of Administrative Services (DAS)	estimated quantities of energy-related commodities purchased under group contracts
State budget documents	expenditures for fuel and utilities

Based on program review committee staff analysis of data available from these sources, it appears *in FY 02, the state of Connecticut spent $98 million on energy-related items for government operations. This represented 1 percent of the state's total budget.*

Figure I-1 shows total energy-related General Fund expenditures by category of spending for state fiscal year 1996 through state fiscal year 2002. The figure reflects data from the Office

of the Comptroller, using the energy-related expense categories defined in the State Accounting Manual.[1]



Most state agencies that are major energy consumers have 24-hour-a-day operations (e.g., dormitories, science labs, etc.). The top two consumers in FY 02 were the University of Connecticut and the Department of Correction.

Table I-1 lists the combined energy-related expenditures for agencies spending $1 million or more in state FY 02 (using the same database represented in Figure I-1). Costs for facilities under the management of the Department of Public Works (DPW) are charged to DPW rather than the agency occupying the space.

As shown in Figure I-2, energy-related spending went down in FY 02. This reversed the trend from FY 99 to FY 01 when expenditures increased annually (even adjusted for inflation) after several years of decreases. (Throughout the same period, total state general budget expenditures went up every year.) S*tate energy-related expenditures in recent years reflect a combination of changes in price and usage.*

[1] "Util" is the "Utility Services" code that allows agencies to combine all expenditures for utility services into a single category rather than separating the charges out. The Department of Transportation (DOT), the University of Connecticut Health Center, and the Judicial Department are the only large energy consumers that use this category to report the bulk of their expenditures.

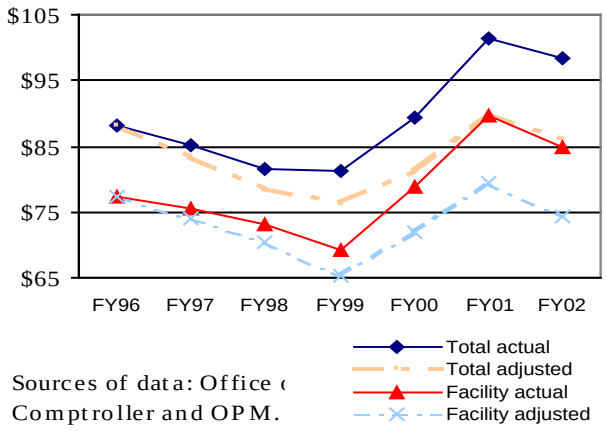
"MtrVeh" is the "Motor Vehicle Supplies" code, which includes a variety of items for maintenance of vehicles as well as fuel to operate them. The numbers for "MtrVeh" in Figure I-1 are an estimate of expenditures for unleaded gasoline and diesel fuel, based on program review committee staff analysis of information from the Departments of Transportation and Administrative Services regarding quantities consumed and prices paid in recent years for those items.

TABLE I-1. State Agencies Spending $1 Million or More for Energy in FY 02.	
Agency	***Expenditures***
University of Connecticut	$25.1 M (includes $7.4 M for the Health Center)
Department of Correction	$12.3 M
Department of Transportation	$10.1 M (includes highway lighting)
Department of Public Works	$7.5 M (includes space occupied by other agencies)
Connecticut State Universities	$7.2 M
Judicial Department	$5.0 M
Community-Technical Colleges	$4.6 M
Department of Education	$4.1 M (includes 17 vocational-technical schools)
Department of Mental Retardation	$3.6 M
Department of Mental Health and Addiction Services	$3.6 M
Department of Children and Families	$3.3 M
Department of Public Safety	$2.7 M
Military Department	$2.2 M
Department of Environmental Protection	$1.2 M
Legislative Management	$1.0 M
Source of data: Office of the Comptroller.	

The total amount of energy consumed annually by the state since FY 96 was not available. However, annual consumption data for state facilities are collected and summarized by the Office of Policy and Management.[2]

Annual energy-related expenditures for state facilities, also displayed in Figure I-2, represented nearly 90 percent of total energy spending. The pattern of spending for facilities mirrored the state's total energy spending, but changed at slightly different rates. From state FY 96 to FY 02, total energy expenditures in actual dollars rose 12 percent, while facility expenditures rose 10 percent. (Adjusted for inflation, expenditures decreased 2 percent and 4 percent respectively.)

FIG. I-2. State Energy-Related Expenditures (in millions)

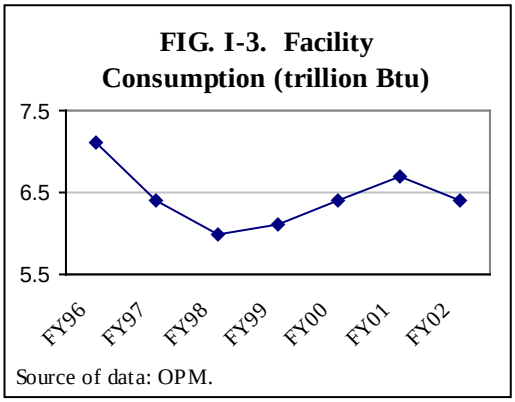


Sources of data: Office of the Comptroller and OPM.

Figure I-3 shows the amount of energy consumed annually by state

[2] The Monthly Consumption Monitoring Database tracks facility-related energy use and expenditures for heating, cooling, and electricity, as reported by budgeted agencies. (It does not include items such as highway lighting and gasoline.) Use of the database for comparisons over time must be done carefully. Facilities may open or close, and in a given year, one or more agencies may not submit data for every month. Appendix A contains a detailed description of the database and a year by year summary of consumption levels since FY 90.

facilities from FY 96 through FY 02, using a standard unit of measurement -- the Btu.[3] *In recent years, state facilities have used approximately 6 trillion Btu annually*. (In 1999, the most recent year of data available, combined energy consumption for all customer sectors in Connecticut was 839 trillion Btu.[4])



Consumption levels for state facilities declined last year after a three-year period of annual growth. The amount of energy consumed in FY 02 was the same as in FY 00 and FY 97. Fluctuations in usage reflect changes in the amount of space occupied by the state,[5] variances in data reporting by individual agencies, and the effects of energy efficiency projects.

The state of Connecticut has taken steps to reduce its energy consumption using a combination of conservation and efficiency measures. (Chapters Two and Three contain information about specific activities that have been undertaken.) Total state energy use would be higher today, if no energy-reduction steps had been taken.

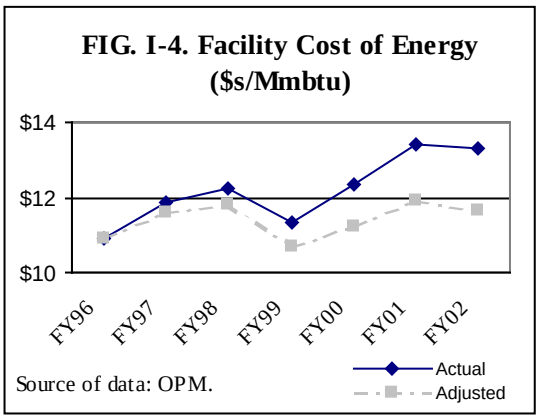


Figure I-4 displays state facility expenditures in terms of dollars spent per million Btu (Mmbtu) from FY 96 through FY 02. Overall, the unit cost increased 22 percent, but only 7 percent when adjusted for inflation. During this period, FY 99 was the only year when the average cost per Mmbtu declined noticeably from the previous year.

Looking back farther, in FY 90, the facilities in the database spent $59.3 million for 6.6 trillion Mmbtu of energy. In FY 02, expenditures totaled $84.9 million for 6.4 trillion Mmbtu.

A key difference between the two time periods is the type of energy consumed. The amount of No. 4 and No. 6 oil purchased declined 90 percent, while the quantity of natural gas consumed tripled. The amount of electricity used grew 37 percent.

[3] Btu is "British Thermal Unit," a standard unit for measuring heat energy in a fuel source. Specifically, it is the amount of heat needed to raise the temperature of one pound of water by 1 degree Fahrenheit (F) at or near 39.2°F.

[4] U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2000* (August 2001), Table 1.6 State-Level Energy Consumption, Expenditures, and Prices, p. 15.

[5] According to the *Recommended Statewide Capital and Facilities Plan 2002-2006* (p. 3), in FY 85, the state owned 40 million square feet of space and leased another 3 million square feet. In FY 95, it owned 47 million square feet and leased 3 million. By FY 00, the state owned 51 million square feet and leased 2.6 million square feet.

Chapter Two

State Energy Savings

Energy requirements are an ongoing consideration in the construction of new state buildings and the maintenance of existing structures. Major efforts to reduce state building energy costs undertaken in the 1970s and 1980s focused on conducting energy audits, adopting life-cycle cost analysis standards, and completing energy conservation renovations. In the 1990s, the legislature directed the larger utilities in Connecticut to help the state reduce its energy expenses and required the utilities to pay part or all of the cost of the work.

Many of the state's efforts to lower energy consumption focus on reducing the amount of electricity used, but other projects replace or reduce other fuels consumed for heating and for motor vehicles. Examples of projects undertaken by the state include:

- updated lighting (e.g., replacing old fixtures with more efficient ones and installing motion sensors to control the amount of time the lights are on);
- converting equipment in facilities from the use of No. 6 fuel oil to natural gas;
- pilot programs to obtain power from photovoltaics and fuel cells; and
- installation of more efficient equipment and materials (e.g., hot water heaters, insulated windows, high R-factor roofing systems, etc.).

Other efforts involve group purchasing opportunities and behavioral changes to shift the time of day and manner in which energy is used. For example, information from the interval metering program coordinated by the Office of Policy and Management helps agencies control expenditures by giving them a better understanding of electricity usage patterns within their facilities. Because the rate non-residential customers pay for electricity is based on peak usage, adjusting the time when equipment starts and stops helps avoid spikes in consumption that lead to high peak pricing levels. (See Appendix B for a detailed description of the interval metering program.)

The best way to assess the value of energy conservation programs is to calculate the savings they produce. The value of a project is derived by balancing up-front costs against estimated long-term savings, with additional consideration given to environmental benefits. Private businesses investing in energy projects usually target spending reductions within specific percentage ranges and payback periods. (Savings rates will vary by type of project.)

Factors affecting <u>estimated</u> savings:

- ⇒ cost of replacement product
- ⇒ useful life of replacement
- ⇒ difference in efficiency between replacement and original equipment
- ⇒ cost of fuel for replacement
- ⇒ cost of fuel for original equipment
- ⇒ cost of maintaining replacement versus original equipment

Savings estimates take into consideration factors such as those listed in the adjacent box. In order to determine dollars saved, one must determine the amount of energy saved. To obtain both numbers, information is needed about base line consumption and the product(s) involved in

a project; then projections must be made about future energy prices. The resulting estimate of savings can fluctuate considerably, depending on the values selected for the components.

The reliability of the value assigned to each component of the equation varies. For example, the cost of a replacement product should be readily known. Characteristics such as the useful life of the product and the difference in efficiency versus the equipment being replaced also should be attainable. More difficult to quantify is the price of fuel in the future. Although trend data incorporating fuel reserves, weather forecasts, and anticipated world events are available, ultimately this number represents a guess.

Keeping in mind the imprecision of savings estimates, it is still worthwhile to look at the results of the energy management projects the state has undertaken. *Unfortunately, no comprehensive compilation of the state's energy efficiency investments exists.*

A variety of databases contain information (in a mix of formats) about energy-related projects undertaken to reduce the amount of energy used by the state. The Department of Public Works has records describing the type of equipment installed, the company performing the work, the location where the work was done, and the cost. However, not all of the information is available for every project. Further, most of the databases are limited to a single program or to activities coordinated by a specific electric or natural gas utility company, and projects individual state agencies entered into directly with a utility may not be in the databases.

Based on a program review committee staff analysis of available documentation, *it appears energy efficiency measures undertaken for state of Connecticut properties between 1990 and 2001 included:*

- *at least $48.5 million for electricity-related projects, resulting in estimated lifetime savings of 2 billion kilowatt hours (kWh) and $153 million -- a return of $3.15 and 41 kWh saved for each dollar invested; and*
- *$1.6 million for projects involving natural gas, producing estimated lifetime monetary savings of $3 million (and an unspecified amount of energy) -- a return of $1.88 for each dollar invested.*

For the most part, the expenditures reflect the cost of materials and labor. In some cases, additional costs such as waste removal and quality assurance were included as well. The cost of preliminary activities such as energy audits were also included, if they were performed in conjunction with a specific project.[6]

The money to pay for the projects came from state bond funds and contributions from large energy-related public service companies in Connecticut statutorily required to participate. In the early years, expenses incurred by the utilities became part of the rate base, and customers eventually paid for the work. More recently, money for new projects came from a fund financed by a surcharge on electric ratepayers. The state paid about one-third of the cost of the electricity-related projects summarized above and half of the cost of the natural gas projects.

[6] Savings from energy conservation projects undertaken in the 1970s and 1980s, which may still have been producing savings during the 1990s, are not reflected in the estimates presented.

Energy savings data were not available for the projects involving natural gas. Monetary savings were calculated prior to the start of the purchasing pool program currently available to state agencies.

A key component of the savings equation not factored into the estimated numbers is the environmental benefits of using less electricity. Besides reducing the quantities of sulfur dioxide (SO_2), nitrous oxide (NO_x), carbon dioxide (CO_2), and mercury released into the atmosphere, the demand for natural resources will be lessoned. Another less tangible result of shifting to a more diversified fuel mix and increasing the use of renewable energy sources is the benefit to national security when the United States can reduce its reliance on other countries for energy supplies.

Table II-1 lists the major programs the state used to obtain energy savings since 1990. These programs paid for more than 2,500 projects in dozens of buildings benefiting nearly every state agency. Additional work was accomplished when individual state agencies used funds from projects involving new construction to partner with utilities in the geographic area to incorporate energy-efficiency enhancements within those projects.

Table II-1. Major Energy Conservation Programs for State Government in the 1990s.

Program	***Activities***	***Participants and Cost Share***	***Years***
P.A. 90-221 (Sec. 16a-37a)	relamping, retrofits of lights, etc.	electric public service companies worked with OPM assisted by DPW -- costs paid by utilities	1990-91
P.A. 91-6 June Spec. Sess. and P.A. 93-417 (Sec. 16a-37d)	improved energy performance (e.g., exit lamp replacements)	electric and natural gas public service companies worked with OPM and DPW -- costs shared 50/50 by utilities and the state	1992-99
P.A. 98-28 (Sec. 16-245m)	cost-effective energy conservation programs (e.g., lighting, motors)	electric utilities with DPW -- costs paid for with ratepayer financed Energy Conservation & Load Management Funds and some state dollars	2000 - ongoing

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Chapter Three

State Energy Policies and Programs

More than three dozen sections of the Connecticut General Statutes address state energy policy or assign energy-related duties to specific entities. Many of these laws were adopted in the late 1970s and early 1980s after the United States experienced high energy prices and fuel shortages, but additions continued throughout the 1990s.

A number of these statutes address areas still of concern today and propose solutions that remain feasible. Existing statutes already require:

- preparation of periodic energy plans;
- consideration of energy efficiency in the purchasing process;
- consumption monitoring by state facilities; and
- life-cycle cost analyses for space acquisitions and construction projects.

In addition, C.G.S. Sec. 16a-35k, adopted in 1978, outlines the state's energy policy in detail. It specifies the state should conserve energy resources by avoiding unnecessary and wasteful consumption as well as utilizing renewable energy resources. Although the policy is aimed at all of the state's citizens, the legislature specified implementation "constitutes a significant and valid purpose for all state actions."

In seeking solutions to today's energy issues, it is important to take into consideration compliance with current statutory requirements. *The program review committee believes many of the elements of a comprehensive program targeting energy conservation and the use of multiple fuel sources by the state of Connecticut already exist in statute, but full implementation is not occurring.*

Appendix C summarizes key statutes related to state government energy management, indicates the year of enactment, and provides an update on agency compliance with specific requirements. In many cases, state agencies undertook the initial steps to implement new energy-related programs and prepared required reports for a few years. Eventually, however, the activities were reduced or stopped, even though the statutory mandates were not changed.

For example, in the early 1990s, OPM was directed to establish two programs to give state agencies incentives to reduce energy consumption. Under C.G.S. Sec. 4-16f, agencies can receive bond funds for projects that reduce costs and increase efficiencies through capital investment, including those using energy efficiency measures. The program has not been widely publicized, and it does not appear to be well known. As of May 2002, only two agencies ever requested (and received) money for projects, and neither was energy-related. Approximately $600,000 of the original $2.9 million program allocation remains unused.

Concurrently, under C.G.S. Sec. 16a-37c, state agencies were to be offered incentives to achieve savings through energy conservation. Under the program, over the useful life of the

conservation measures, participating agencies would retain at least 50 percent of the annual savings to use for future energy costs or conservation activities. Regulations governing the program went into effect in December 1991, but no agencies ever applied to the program.

Likewise, C.G.S. Sec. 16a-39b set up a task force to develop incentives for conserving energy in state buildings. The task force met occasionally and issued annual reports from 1990 to 1993. It has been inactive since.

In other cases, statutory requirements are met, but limited effort is made to share the information or link the results with other related requirements. An example involves the state's consumption monitoring database. As required by C.G.S. Sec. 16a-37u(a)(3), the OPM energy unit maintains a cumulative database on the quantity and cost of the energy consumed monthly by state facilities. Periodically, OPM staff examine the data for planning or budgeting purposes. They also prepare reports for other entities on request, but no annual compilation is published in a location readily available to the public or other governmental entities.

In still other instances, OPM has taken steps to implement mandates, but the outcome has been unsuccessful. For example, C.G.S. Sec. 16a-14e requires the state to set up an electricity purchasing pool. In December 1999, OPM, working with the Department of Administrative Services, issued a request for proposals (RFP) for an electric procurement contract. Two bids were received by the February 2000 deadline, but both were disqualified. (One arrived late; the other did not comply with bid requirements.)

In September 2002, OPM issued an RFP to cooperatively purchase electric generation services for the state's approximately 300 unmetered street lighting accounts in the service territory of Connecticut Light & Power Co. (Annual consumption is estimated at 3.5 million kWh.) Bids are due in early October 2002, with a targeted start date of no later than January 1, 2003.

The next attempt to set up a more comprehensive electric purchasing pool is expected to be announced in the second half of 2003. That RFP will seek to address problems identified with the scope of the first contracting effort. For example, the proposal may allow for the phase in of the required residential component for individuals receiving means-tested assistance.

A similar purchasing program initiated voluntarily by OPM has been more successful. Since 1996, OPM and DAS have operated a natural gas purchasing pool. (See Appendix D for detailed descriptions of the electric and natural gas purchasing programs.)

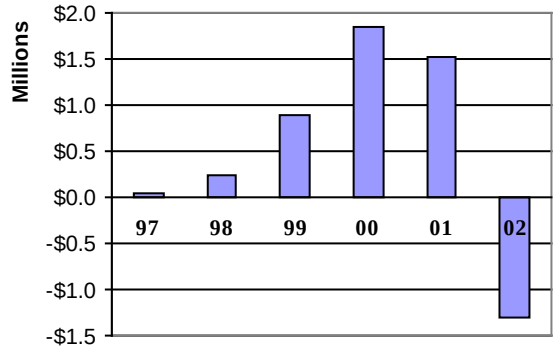
The natural gas contract is a competitively bid, multi-year agreement available for use by multiple state agencies. Participating agencies obtain natural gas supplies under a group, firm contract price negotiated by OPM and DAS. The participating agencies also attain other benefits including:

- experience working with suppliers of a less traditional commodity;
- a more efficient bill paying system; and
- some agencies were prompted to consolidate the meters in their facilities, thereby reducing monthly fees for equipment.

From FY 97 through FY 00, the number of state agencies signing up one or more facilities for the natural gas procurement program increased annually. In FY 01, participation leveled off at 19 agencies (with 31 reporting locations).

Figure III-1 shows annual program results from the start of the program in January 1997 through June 2002. Until FY 02, the state annually saved 12 to 22 percent of the dollars it would have spent for participating accounts, if there was no contract. Individual agency savings varied, and a few small agencies paid more.

FIG. III-1. Natural Gas Procurement Program Results



Source of data: OPM.

In FY 02, all but three of the 31 participating accounts paid more than if they had remained traditional natural gas customers. Overall, the cost was 16 percent higher.

Despite the recent results, savings from the early years of the program still outweigh the losses. (Cumulative savings since the start of the program total $3.2 million.) While the possibility of losses always exists with contracts involving the volatile futures market, the program is important as an example of the state taking an innovative approach toward business operations, something more commonly found in the private sector.[7]

The key reasons for the difference in the state's success at implementing the natural gas purchasing effort versus the electricity purchasing pool are:

- variations in the nature of the marketplace for each fuel; and
- the absence of a requirement that customers besides state agencies be allowed to participate in the natural gas program.

Competition in the electric sector is controlled by restructuring legislation passed in 1998. It specifies many of the details of how the system must operate, including a cap on the overall price per kWh customers pay. Generation of electricity has been deregulated, but transmission continues to be regulated by the Federal Energy Regulatory Commission (FERC).

Competition within the natural gas market in Connecticut opened up in the late 1990s when the Department of Public Utility Control (DPUC) began allowing commercial and industrial customers to obtain natural gas from third-party suppliers. The latter system lets the market set the price based on a variety of factors, and customers buy from the vendor of their choice.

Another area where the state has had limited results concerns alternative and renewable energy. The role of these sources in the mix of fuels used by the state is small (as it is for most

[7] Another approach used by DPW to reduce natural gas costs in several buildings is a flexible, interruptible rate. Under the agreement with the natural gas company, if DPW can show it would cost the state less to switch over to oil, the designated backup fuel, the utility gives the state a comparable rate to keep them as a customer.

energy consumers). Indeed, a deterrent to wider use of alternative fuel sources in recent years has been the low price of fossil fuels, which widens the cost differential when comparisons are made with traditional approaches.

However, the state has undertaken several initiatives involving renewable energy.[8] For example, photovoltaic and micro-turbine equipment are in use at state university campuses, and fuel cells are being installed at multiple state locations.[9] Likewise, in mid-2002, DPW made a policy decision to have future major, state construction projects comply with minimum U.S. Green Building Council standards, which take into consideration energy and environmental concerns. At the same time, one of the program goals in the 2002 State Energy Plan (SEP) calls for the legislature, OPM, and DPW to work on development of a system to enable all state funded buildings to meet or exceed the Green Building Council's Silver Standard design rating.

In evaluating agency compliance with mandated energy-related tasks, it is appropriate to examine the value of the tasks completed and those left undone as well as inquire why mandated tasks are not being carried out. Causes for noncompliance vary, but key reasons seem to be decreases in the level of available resources and the priority given to energy-related goals.

During the past 25 years, executive branch staff assigned to energy-related tasks decreased considerably. At the end of the 1970s, OPM had a separate Energy Division and as many as 90 people in the agency -- 63 percent of them federally funded -- performed energy-related duties. In 2002, the 10-person energy unit is part of the Strategic Management Division, and federal funds support 56 percent of the cost.[10] Furthermore, only some staff perform functions directly involving state government operations. Others work with municipalities, small businesses, petroleum vendors, and residential consumers on activities specific to their needs.

Energy-related resources at the Department of Public Works have also changed since 1970s. At that time, DPW was a bureau in the Department of Administrative Services. An Energy Management Division, which was eliminated in FY 87, employed a number of retired engineers -- some as state employees and some as consultants -- to conduct energy audits of state buildings. Other staff dealt with energy considerations within the context of the diverse range of activities the agency handles for state construction and leasing projects. Today, DPW is an independent agency, and three full-time equivalent staff are assigned to energy-related duties.

To facilitate the ongoing success of the state's energy management efforts, the program review committee believes the legislature should clarify what the agencies charged with implementation are expected to accomplish. Statutory language should set the direction of the state's energy management effort, but day-to-day operational details of individual programs should be left to the implementing agencies. At the same time, an agency unable to perform mandated functions must call attention to such situations and explain why the work cannot be

[8] Sec.16-245n defines "renewable energy" as solar, wind, ocean thermal, wave or tidal energy, fuel cells, landfill gas and low emission advanced biomass conversion technologies, and other resources and emerging technologies not involving combustion of coal, petroleum, petroleum products, municipal solid waste, or nuclear fission.

[9] The Connecticut Clean Energy Fund's support of Connecticut based companies marketing new technologies also assists state government by increasing the range of alternative energy options available to all energy consumers.

[10] In 1990, energy-related functions were placed in the Policy Development and Planning Division of OPM. They moved to the current division during FY 99.

done. Then the legislature can decide whether to continue the requirement or change the resources assigned to it.

Existing statutes related to state energy management should be reviewed to:

- eliminate out-of-date energy-related requirements (whether completed or not);
- delete completed, one-time tasks;
- consolidate related tasks;
- remove requirements where the cost of enforcement considerably outweighs the consequences of a violation; and
- clarify the agencies performing specific tasks.

Nearly a dozen sections of the statutes are candidates for revision. **The program review committee recommends the following statutory changes related to state energy management activities:**

- **amend Sec. 16a-35m to replace the requirement for a comprehensive energy plan prepared every four years with a biennial report on the energy situation in Connecticut, including any unique issues facing state government as an energy consumer;**
- **repeal Sec. 16a-36 re minimum temperature setting of 78º for artificial cooling of state buildings because enforcement is impractical;**
- **repeal Sec. 16a-36a re maximum temperature setting of 65º for artificial heating of state buildings because enforcement is impractical;**
- **repeal Sec. 16a-37d and Sec. 16a-37e to eliminate a program aimed at improving energy performance in state buildings that has been superseded by new programs;**
- **repeal subsection c of Sec. 16a-37u requiring the connection of state buildings to a district heating/cooling system because all feasible connections have been made;**
- **amend Sec. 16a-38a to replace detailed requirements for energy audits of all state-owned buildings (in subsection a) and an out-of-date schedule for retrofit projects (in subsection b) with provisions for an on-going process to evaluate the energy requirements and retrofit opportunities of individual state buildings periodically, but at a minimum prior to any major renovation;**
- **transfer subsection c of Sec. 16a-38a regarding energy performance preferences in leased space to Sec. 16a-38h to combine energy-related requirements involving leased space;**
- **amend Sec. 16a-38i to require DPW to establish a standardized process for calculating annual average energy use based on the state buildings under its control and give OPM responsibility for implementing the system statewide in conjunction with its energy use and cost monitoring duties under subsection a of Sec. 16a-37u; and**

- **amend Sec. 16a-39b to replace the task force on conserving energy in state buildings with a requirement for periodic meetings of the personnel responsible for energy management at the state's largest energy consuming agencies to discuss opportunities for savings.**

The statutes listed above were adopted at various times between 1977 and 1991, although some were subsequently modified. They specify, often in great detail, tasks agencies are to perform -- some only once; others on a recurring basis.

As indicated, most of these statutes need modification to reflect completion of a task or acknowledgement of changes already implemented administratively. If state agencies or other affected parties believe statutes proposed for repeal or amendment should be retained as currently written, they will be able to present evidence explaining why as part of the public hearing process during the 2003 legislative session.

To complement the changes presented above, the program review committee also proposes several additional requirements to elevate consideration of energy-related issues, particularly during the budget process. Specifically, **the program review committee recommends:**

- **each state agency be required to include as part of its biennial budget, the total dollars requested for energy within the budget, its plans for energy conservation in the coming biennium, and the progress the department has made in the prior biennial period in energy conservation;**
- **the Office of Policy and Management be required to ask all state agencies to report on how each agency can reduce energy costs and provide that information as part of a joint public hearing before the Appropriations, Energy and Technology, and Program Review and Investigations Committees; and**
- **the Office of Policy and Management be required to report on agency compliance with life-cycle cost analysis requirements.**

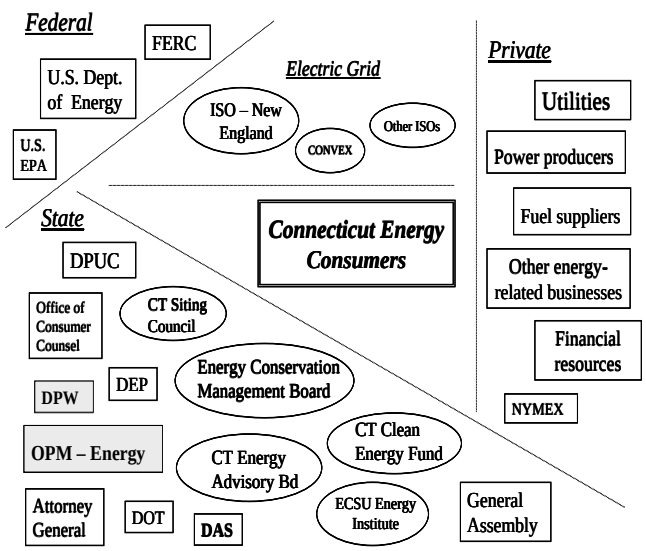
To ensure future construction projects undertaken for the state of Connecticut incorporate energy-related elements, **the program review committee recommends setting a new construction standard for state-owned buildings equal to or greater than accepted national standards for energy conservation in new construction**.

Chapter Four

Program Administration

Another necessary component for improving the state's energy management program is identification of a primary agency to lead the effort. Figure IV-1, prepared for the program review committee's February 2002 *Energy Availability* study, shows the range of entities with energy-related roles in Connecticut. Nearly all influence multiple categories of energy consumers including state government, and for many, energy duties represent only a portion of their mission.

FIG. IV-1. Entities Involved with Energy in Conn.



The principal entities involved in state government's energy management efforts are the Office of Policy and Management and the Department of Public Works. The Department of Administrative Services plays an important role facilitating purchases, while employees in individual state agencies carry out day-to-day tasks such as plant maintenance and data collection. (See Appendix E for a detailed list of the energy-related duties of the key state agencies.)

Currently, no single entity is responsible for the management or coordination of all energy-related tasks on behalf of the state of Connecticut. Nor, in recent years, has any state entity sought a leadership role regarding energy management. Indeed, some staff directly involved with state-level energy efforts were unaware of some long-standing laws requiring specific actions until program review staff asked about the performance of those functions.

Based on existing statutory language, it would seem OPM is expected to be the principal agency guiding and implementing state energy policy. C.G.S. Sec. 16a-37u specifies the secretary of OPM is "responsible for planning and managing energy use in state-owned and leased buildings and shall establish a program to maximize the efficiency with which energy is utilized in such buildings."

OPM is also supposed to establish goals to reduce state energy consumption and maximize the use of energy conservation and load management programs offered through public service companies. Further, with respect to the allocation, rationing, conservation, distribution, and consumption of energy resources, C.G.S. Sec. 16a-14 authorizes the secretary of OPM to:

- be the state official to implement all federal programs and laws;
- investigate complaints and transfer evidence to the proper authorities; and
- coordinate all state and local programs.

In practice, OPM does not currently have a high-profile role in the energy area. As described previously, OPM routinely performs only a portion of the energy-related activities statutorily assigned to it. Efforts related to state government operations focus on aspects of monitoring consumption and reducing fuel costs. Further, because these tasks are directed from OPM's office in Hartford, the agency attains limited visibility with its energy efforts.

The primary energy-related responsibilities of DPW involve aspects of property management. The department interacts with employees of individual state agencies and outside contractors on construction projects to retrofit existing facilities or incorporate energy efficient measures into new buildings. DPW staff coordinates the various energy efficiency projects the state undertakes and signs off on payments to contractors for work completed.

DPW staff are more likely to be involved with energy considerations involving space owned by or being built for the state than leased space. For example, under C.G.S. Sec. 16a-38h, DPW is not supposed to execute new leases for more than 10,000 square feet of space unless the owner conducts an energy audit, implements improvements, and provides energy consumption data. Based on information collected as part of the program review committee's December 2001 *Department of Public Works Space Acquisition and Disposition* study, it does not appear compliance with these requirements is routinely verified.

Other entities whose actions could affect state government's energy management efforts include the Connecticut Energy Advisory Board and the Energy Conservation and Management Board (ECMB) in conjunction with the DPUC. In practice, although CEAB includes members from six state entities and is charged under C.G.S. Sec. 16a-3(b) with making recommendations to enhance the state's energy management, the focus of the group is on discussion of a wide range of energy issues rather than implementation of specific projects. Alternatively, the role of ECMB is focused on advising and assisting with the development and implementation of cost-effective energy conservation programs for all categories of electric customers. The majority of its focus is on nongovernmental efforts.

A new participant in the system is the Institute for Sustainable Energy at Eastern Connecticut State University. Initially funded principally with money from the funds overseen by ECMB and DPUC, the institute hopes to focus on energy issues of interest throughout the New England region. The institute is currently working on assessments of Long Island Sound natural resources and certain transmission line issues in accordance with Public Act 02-95. As a result, most institute activities to date only affect Connecticut governmental agencies indirectly.

Ultimately, it may not be necessary to give a single agency formal responsibility for management and control of all state government energy-related activities. The best chance for achieving the state's energy goals -- reduced consumption, lower costs, and greater use of alternative energy -- would seem to lie with a system that incorporates all participants in the process and makes them stakeholders in the outcome of the efforts undertaken.

For the present time, the program review committee believes the Office of Policy and Management should remain the primary entity for coordinating state energy management efforts. However, OPM must take on a more visible and vocal role regarding opportunities for energy conservation within the state. Resources should be targeted to identifying and educating state

agencies and individual state employees about steps they can take to make a difference in the state's overall energy consumption profile. Potential actions state workers could take include:

- identifying additional opportunities for energy savings within their work site;
- making fuel consumption a consideration in all operational decisions; and
- taking personal steps to reduce the amount of energy they use.

Public energy conservation education efforts are sometimes dismissed as having too limited a return. But, in the long run, their cumulative effect can make a difference.

The program review committee recommends the Office of Policy and Management take steps to increase its influence over state energy management practices and elevate its public presence regarding energy issues. At a minimum, OPM should identify basic energy conservation practices individual state agencies will be expected to adopt, and it should promote the incentive program established under C.G.S. Sec. 16a-37c. It also should provide more information to state employees about opportunities for energy savings.

OPM should convene periodic meetings (in conjunction with DPW) of representatives of the state's largest energy consuming agencies to discuss energy conservation issues and opportunities. Likewise, OPM staff currently attend CEAB meetings, but do not participate in the discussions. In the future, they should be active participants, helping identify areas of focus and bringing attention to issues within the scope of the board.

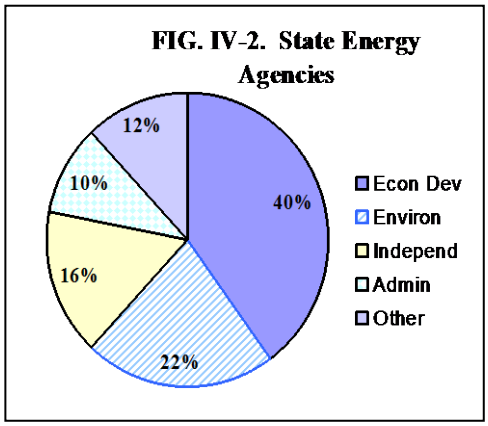
Another area where OPM could improve its energy-related efforts is the quantity and timeliness of the data posted on the agency web site. The OPM web page contains a section called "Energy Data." In October 2002, the most recent Connecticut consumption data on the page was from 1996, even though information for 1999 has been available from the Energy Information Administration (EIA) since mid-2001. The web site also would be a good location to post data about state government energy use such as a summary of information from the state facilities consumption monitoring database.

The program review committee also believes additional discussion of the best organizational structure for creation and implementation of state energy-related activities is warranted. To assist with that effort, **the program review committee recommends the Connecticut Energy Advisory Board do an analysis of what would be the appropriate state entity to have responsibility for oversight of state energy policy.**

Other states. Comprehensive energy programs including outreach efforts to various types of customers and management of state government activities are coordinated under a single entity in a number of states. However, agencies other than the primary one are frequently involved in implementation of energy-related programs. Likewise, in most states only a limited portion of the state's energy-related resources are specifically directed toward state government facilities.

The type of agency with responsibility for state energy management varies around the country. Figure IV-2 summarizes the location of the primary governmental entity for overall energy operations in each state.

The most commonly used agencies are those concerned with economic development and commerce (40 percent) or environmental and natural resources (22 percent). Sixteen percent of the states have some form of independent energy agency, while 10 percent put the energy function in an administrative or general services agency. Other locations include the governor's office or a utility-related entity.



Funding

The money to pay for initiatives to reduce state agency energy consumption has come from multiple sources. Utility ratepayers and shareholders, the federal government, and oil companies have all contributed directly or indirectly to the state's energy retrofit projects. State General Fund dollars cover staffing and administrative expenses, while state bond funds have been an important source of money for energy-related retrofit projects.

Since 1983, Connecticut has received annual disbursements from oil companies as part of federally negotiated settlements with companies that overcharged customers between 1973 and 1981. Two-thirds of the nearly $93 million received by the state (through July 1, 2001) has been used for programs benefiting low-income households; state government projects received several million dollars.

Connecticut also receives annual grants from the federal government to implement the State Energy Plan. In FY 02, Connecticut received $553,000; in FY 03, it will receive $641,000. (The state provides a 20 percent match for each grant.) Again, only a portion of the grant is used for state government projects.

State facilities received approximately $1 million in calendar year 2001 from the Energy Conservation and Load Management Funds as participants in energy conservation programs operated by the utilities for a variety of energy customers. DPW is scheduled to receive $12 million directly from the funds during calendar year 2002 as a result of a legislatively directed allocation in Public Act 01-9 (June Special Session).

With the pending end to gasoline settlement funds, the potential for decreased federal grants, and likely changes in the disbursement of conservation and load management funds, the state is faced with decreased discretionary money for new state-level energy conservation projects. In deciding how to pay for future projects, it is important to consider the role of potential funding sources in the day-to-day operation of the energy system. The amount of effort and creativity a source (e.g., a utility company) puts into the evaluation of options could be influenced by how the project will affect the business operations of the source. For example, there could be an inclination to focus on less costly changes with smaller overall paybacks because those projects would have less impact on future energy sales.

As another option, the program review committee believes the state of Connecticut should investigate further the potential benefits of entering into performance contracts with

private businesses. Under this type of arrangement, an energy service company (ESCO) guarantees the projects it undertakes will result in enough energy efficiencies to produce sufficient annual cost savings to pay the ESCO for its work over the length of the contract. The ESCO finances and installs the agreed upon energy conservation measures up front, and the expenses are paid back over an agreed time period from the savings generated. Contracts can last 25 years, but more typically run from 10 to 20 years, with shorter ones also possible.

To assist individual federal agencies and facilities that want to take advantage of this type of program, the Federal Energy Management Program (FEMP) has developed Super Energy Savings Performance Contracts (Super ESPCs) with pre-selected ESCOs. Six super contracts cover specific geographic regions, while others cover emerging technologies in the renewable energy area. The super contracts establish the general terms and conditions of the agreement, and then individual agencies customize the contract to meet their particular needs.

The program review committee recognizes participation in this type of program requires a major time commitment on the part of state agency staff, particularly during the preliminary stages of developing and negotiating the initial contract. A wide range of issues such as the ones listed in the adjacent box must be clarified before an energy performance contract can be finalized.

Key performance contract provisions define:

- ⇒ tasks contracting agency will perform
- ⇒ tasks contractor will perform
- ⇒ expenses contracting agency will pay
- ⇒ expenses contractor will absorb
- ⇒ quality control requirements
- ⇒ how savings will be measured and verified
- ⇒ how problems will be resolved
- ⇒ length of the contract

Indeed, since the late 1990s, DPW has invested many hours in efforts to write RFPs, evaluate submissions, and reach agreement with an outside vendor to serve as the performance contractor at several state buildings. However, to date, the state has not completed all of the steps in the process with a specific contractor.

The program review committee recommends the Office of Policy and Management and the Department of Public Works pursue new energy performance contract efforts in order to have at least one pilot project in place by July 1, 2003. The agencies shall report on the results of the contract program to the committees of cognizance for appropriations and energy annually for the life of the contract.

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APPENDICES

Appendix A

Monthly Consumption Monitoring Database

C.G.S. Sec. 16a-37u requires the Office of Policy and Management to monitor energy use and costs of budgeted state agencies on a monthly basis. OPM began to collect energy fuel usage data from state agencies in 1981. Detailed monthly usage and expenditure data from FY 92 to the present are accessible through an ACCESS database.

The Monthly Consumption Monitoring Database tracks facility-related energy use and expenditures, by utility and fuel type, as reported by each budgeted agency. The database covers heating, cooling, and electricity. It does not include water or sewer data, nor nonfacility-related usage such as highway lighting or motor vehicles.

The types of energy tracked in the database are electricity, natural gas, district heating and cooling, three types of oil (No. 2, No. 4, and No. 6), and propane. Data about generated energy (i.e., kWh) are also collected, where applicable.

For each agency, the database contains monthly statistics showing the dollars spent and the relevant quantity (e.g., kWh, Ccf, gallon, etc.) consumed for each type of energy reported. Agencies are instructed to report this information based on the ending date of the billing cycle. Thus, the data reflect the month when the energy was consumed, not the month when the bill was received or paid.

The database calculates the average annual price each reporting agency paid for each type of utility and fuel. It also calculates statewide average prices for all of the reporting agencies combined. The database also shows what portion of an agency's energy use is supplied by each specific electric and natural gas utility service provider.

Process. OPM provides agencies with a form to use for reporting monthly data. Agencies are asked to submit the information within 30 days of the end of each calendar month.

About twice a year, OPM sends out delinquency letters to agencies that fail to submit data. Each letter, which is addressed to the designated agency contact person, lists the monthly reports that are missing and includes a reminder that the information is statutorily required. In some cases, telephone calls are made to remind agencies that data have not been submitted.

At the completion of the fiscal year, OPM sends each agency a printout of the data submitted for that year, and agencies are asked to confirm the accuracy of the information. They are asked to correct inaccurate data and/or provide missing data. Agencies have until early September to respond. If OPM does not hear from an agency by the requested date, the data are presumed to be correct.

Participation. The number of reporting agencies in the database varies from year to year based on openings, closings, or consolidations as well as budgeted status. (For example, data for FY 00 included information for 119 different locations within 39 agencies and commissions.)

Some agencies collapse the data for all of their buildings into a single monthly report. Others, such as the Department of Correction (DOC) and the Department of Education (SDE), report data for each institution they operate. Thus, DOC submits data separately for 24 locations and SDE for 21 sites including the 17 regional vocational-technical schools. The University of Connecticut groups its submission into three reports -- Storrs, the regional campuses, and the Health Center.

Reports. The information in the Monthly Consumption Monitoring Database can be analyzed in a variety of ways. OPM annually reports statewide data for each of the categories of information collected. Upon request, the data also can be reported for other periods of time, including the most recent 12-month period, or for specific utility and fuel types.

As the only comprehensive collection of state energy consumption data on a facility level, the information in the database is very valuable. OPM and some individual state agencies use the database for internal analytical purposes.

Use of the database for comparisons over time must be done carefully. The specific facility level of data may change from year to year as portions of buildings or entire facilities are opened or closed. In addition, if an agency, particularly one that consumes large quantities of energy, did not submit all of its data for a given year, then total energy consumption for that year would be under-reported.

The tables on the next page display quantity and cost information from state fiscal year 1990 through state fiscal year 2002 for the primary energy sources used by state facilities. The tables were prepared by the Office of Policy and Management from the Monthly Consumption Monitoring Database.

[insert full-page table from OPM]

Appendix B

Interval Metering Program

As part of the process of preparing for electric deregulation, the state needed more accurate, detailed data on electricity usage by state agencies. The Office of Policy and Management initiated an interval metering system to obtain data for that purpose and to assist facility managers with energy conservation efforts, particularly management of peak load demand.

In the spring of 1999, OPM began meeting with the two electric utility companies serving Connecticut -- United Illuminating and Connecticut Light & Power -- to discuss how to set up the program. In the fall of 1999, the equipment needed for the monitoring program began to be installed on the electric meters of state agencies that use large quantities of electricity.

OPM paid for new meters compatible with the requirements of the interval monitoring system for installation as the billing meters of state agencies with an annual peak load of at least 200 kWh of electricity.[1] A load pulse output socket, which allows collection of real-time usage data, was also installed on each meter. OPM paid for the meter upgrades, which cost $125 each. The utilities installed the meters at no additional cost to the state.[2]

The interval metering system currently uses telephone lines to capture usage data from participating accounts.[3] The telephone line must be in place before the upgraded meter is installed. Individual agencies were responsible for obtaining telephone lines for their meters. They also pay any on-going costs for the telephone lines. (In a few instances, OPM paid for extraordinary expenses that agencies incurred to have phone lines installed in out-of the way places.) Because of the need to acquire new lines in some cases, this step in the process was one of the more time-consuming components of the program.[4]

For each account, data are collected on the amount of kWh used at 15-minute intervals throughout the day, 365 days a year. The information is available in a spreadsheet format, accessible through password protected web sites the day after the electricity has been used. Historic data are also retained.

CL&P, which serves 90 percent of the state agencies in the program, contracts with a North Carolina company -- MDATA Online -- for maintenance of its database and oversight of the web site for its accounts. UI, which serves the rest of the accounts, contracts with ABB

[1] Originally, CL&P recommended selecting agencies with at least 300 kWh annual peak demand. OPM chose 200kWh, but based on experience with the program, it now recommends agencies with a 100 kWh peak participate.

[2] The new meters were actually an upgrade of meters previously put in place by the utilities to capture usage data for rate-setting purposes. This kept the cost of the new meters lower than it would have been if the accounts were being upgraded from a standard residential type of meter.

[3] During 2001, UI began switching all of its customers to meters that can be read using radio signals. Once state accounts change over to that system, usage data are retrieved using the new technology.

[4] Business managers in participating agencies need to be informed of this requirement so they do not take steps to disconnect the telephones as unused.

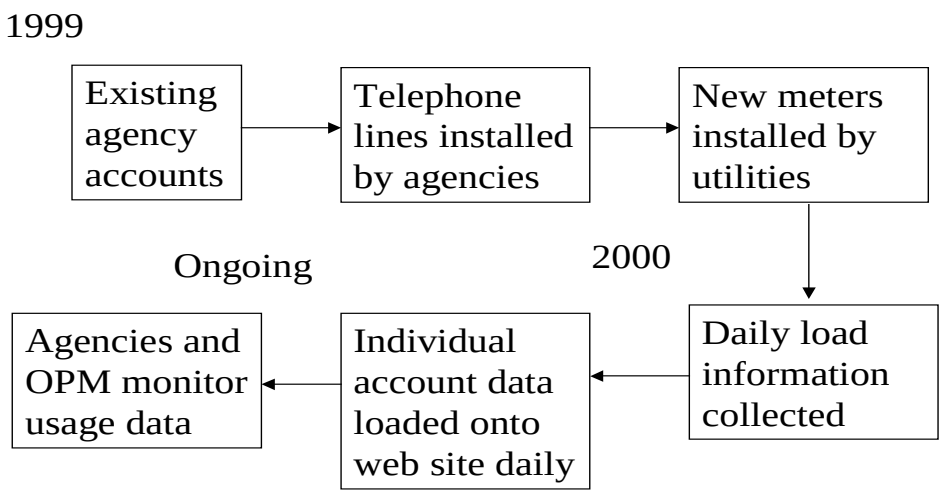
Energy Interactive from California to compile the information for its accounts and make the data available on a web site.

OPM pays each utility a monthly fee (of approximately $25) per account for the web site system. (The utilities in turn pay their respective contractors.) There are also some additional expenses for refinements in the how the data are made accessible to individual agencies. Through FY 01, OPM had spent approximately $64,000 on the program.

OPM has access to all of the data on both web sites. Individual agencies have access only to information for their own accounts. However, an agency can share its password with whomever it wants.

Figure B-1 summarizes the major steps in implementation of the program.

FIG. B-1. Interval Metering Program Time Line.



As of mid-2002, the database included 119 facilities -- 105 CL&P customers and 14 UI customers. Together, those facilities consume about 70 percent of the state's electricity load.

For calendar year 2000, OPM staff sought to verify the data for each participating agency were accurate before all of the data were aggregated. This information is being used to produce the first complete picture of major State electric account usage.

Since the data collected through the interval metering program allows analysis of time of day and seasonal peaks, the system has considerable potential to help state government conserve energy and reduce the cost of the electricity purchased. Facility managers with access to data about usage patterns can investigate wide variations and determine whether steps can be taken to eliminate or at least spread out load demand more evenly during the day.[5]

[5] Other conservation-related opportunities may also arise because of the data available through this program. For example, the state could become a participant in an IOC-sponsored emergency load management experiment.

Office buildings often experience peak demand during morning start-ups. By spreading out the time period when heating and cooling systems, office machines, and coffee pots initially come on (even if only by a half hour), demand levels can be evened out. Alternatively, spikes in usage at unexpected times of the day may help identify malfunctioning equipment.

Reducing the peak demand of an account, particularly if that demand only occurs once a day, can save the state money. This is because commercial customers are charged for electricity based on historic monthly and annual peak demand levels. The specific rate is based on the utility's assessment of customer usage for a rolling period of time prior to when the electricity was consumed.

Any state agency can request training for its staff on use of the interval metering system database. OPM staff already have provided training to a number of community-technical college facility managers as well as DPW facility managers, who are employees of the private management contractors that maintain state buildings.

Future issues. OPM has several issues to resolve regarding the future of the interval metering program. The first concerns the database web site system. Upon expiration of the existing contracts, the state will have to decide whether to renew the contract, buy equipment to monitor the data from the meters itself, or end the program.

If the state were to take full responsibility for the database, additional staff resources would be needed. If the program were discontinued, individual agencies with energy monitoring systems could continue to receive information about their particular accounts, but statewide data would only exist historically for a limited time period. Continuation of the contracts would allow the state to compile additional data useful for analysis and monitoring.

Another issue will arise when the state again seeks bidders for the electric purchasing pool. OPM must decide whether the data compiled through the interval metering program will be shared with all potential bidders or only with the finalist for the contract in order to help them refine their bid.

APPENDIX C. State Agency Compliance with Major Energy- Related Statutes Concerning State Government Operations.			
C.G.S. Sec.	***Adopted***	***Major Requirements***	***Current Status***
4-67f	1992	OPM to establish program to finance state agency projects to reduce costs and increase efficiencies, including those using energy efficiency measures, as well as awards for employees with ideas to improve services or reduce costs -- *Innovations Review Panel* to review/evaluate funding requests, with savings quantified annually and half of unexpended savings (≤$2M) given to implementing agency	*Innovations Review Panel* currently meets 3-4 times a year and receives staff assistance from OPM; since inception, only received one or two energy-related proposals from employees and none from agencies; knowledge of program and availability of money appears limited
4a-56	1990, 1995	DAS specifications for purchasing motor vehicles must consider those using alternative fuels -- allows DAS to adopt energy performance standards per Sec. 16a-38(j)	February 2002 Invitation to Bid for Purchase of 2002 Model Year Various Vehicles sought cars with EPA rating ≥29 mpg highway, natural gas alternative fuel vehicles, and sedans with provisions for bi-fuel natural gas modification and for gasoline-electric powered system
4a-67d	1990 +	state to purchase cars and light duty trucks meeting specific gasoline mileage standards	See Sec. 4a-56 above
4b-23	1979 +	"State Facility Plan" to include policies that encourage cost/energy efficiencies and retrofit measures that best attain energy performance standards established under Sec. 16a-38; in conjunction with plan, life-cycle cost analyses to be completed for proposed facilities and increasing portions of state construction projects are to be served by renewable energy	2002-2006 plan has goal of achieving life-cycle cost efficiency in state facilities, notes State Building Code includes energy standards to improve efficiency of new/renovated buildings, and describes energy efficiency programs the State and electric/natural gas companies are conducting to improve energy performance of state buildings -- in practice, prominence given to energy considerations varies by project
10-95i	2000	"Five-year capital improvement and capital equipment plan" for Regional Vocational-Technical School System to include recommendations (and cost) for energy efficiency improvements to each v-t school	RVTSS plan for 2000-2005 includes annual cost savings for 4 schools, but no recommendations for any schools; 2001-2006 plan has no specific references to energy, but listed projects will help conserve energy (e.g., HVAC repairs, lighting changes, roof replacements, etc.)
13a-110a	1995	must replace state-funded outdoor luminaries for roadway lighting with those that maximize energy conservation (and minimize light pollution) unless not cost-effective	specifications established by DAS in conjunction with DOT based on federal standards; all new purchases are to meet the standard

APPENDIX C. State Agency Compliance with Major Energy- Related Statutes Concerning State Government Operations.			
C.G.S. Sec.	***Adopted***	***Major Requirements***	***Current Status***
13b-4	1977	DOT to prepare detailed reports of energy use analysis by mode of transportation	no analytical reports prepared; compile some data on DOT's own energy consumption
16-245m	1998, 2001 2002	creates *Energy Conservation and Load Management Fund* and *Energy Conservation Management Board* (advisory to DPUC) to carry out cost-effective energy conservation programs for electricity customers -- report annually to General Assembly during CY02, $1M/month directed to DPW for energy conservation projects in state buildings	assessment on customers generated $86M in 2001 -- used for projects to achieve estimated lifetime savings of $473M and 4.7M kWh, with $1M and 0.1M kWh directed at state buildings DPW developed list of 32 potential projects estimated to cost $7.7M -- since May 2002, has begun implementing four projects costing ~$3M
16-245n	1998	creates *Renewable Energy Investment Fund* (aka *Conn. Clean Energy Fund*) to promote investment in renewable energy sources -- annual report required	assessment on customers generated $13M in 2001 (rate will grow annually) -- fund invested $9M in seven companies marketing clean/ renewable energy or producing clean-energy products and committed $7M to deployment/ development of fuel cells including at least one project at a state facility
16a-3 and 16a-7	1974 +	establishes *Conn. Energy Advisory Board* to make recommendations re: programs to enhance the state's energy management and to carry out Sec. 16a-35k Special Act 99-15 required board to conduct a study "to update and strengthen the state's energy policy"	after period of inactivity, for past few years board has met monthly; February 2000 "Energy Policy Report" identified long-range energy policy goals/strategies, but implementation limited; held workshops to discuss issues and conference on sustainable energy planned for fall 2002, but no specific steps taken to achieve long-term solutions -- to extent same concerns raised by others, some issues receiving attention.
16a-9	1974 +	continued "Energy Emergency Plan" establishing programs/controls/quotas for allocating energy resources -- must be submitted to General Assembly	original plan submitted January 1975 -- explains process for calculating shortage index and lists contingency measures with potential energy savings by category of consumer (e.g., restrict activities, adjust temperatures, ration gasoline); 1980 amendments adjust implementation details; OPM staff keep contact information up-to-date

APPENDIX C. State Agency Compliance with Major Energy- Related Statutes Concerning State Government Operations.			
C.G.S. Sec.	***Adopted***	***Major Requirements***	***Current Status***
16a-14	1974 +	OPM secretary to implement federal directives and coordinate state/local programs re: energy allocation/ rationing/conservation/distribution/consumption -- also adopt regulations for solar energy systems standards	regulations effective 1980, 1981, and 1986 define eligibility for property and sales tax exemptions for solar, renewable, and cogeneration systems
16a-14b	1979 +	OPM to develop voluntary testing program for energy-related products -- consulting DCP, adopt regulations re: procedures for tests, products covered, fees, etc	regulations effective April 1981; no tests ever conducted
16a-14e	1998	OPM to operate electricity purchasing pool	OPM (through DAS) issued RFP in December 1999 with bids due February 2000 -- no qualified bids received; September 2002, issued RFP for electric generation services for unmetered street lighting; new RFP for more comprehensive services targeted for late 2003
16a-35m	1979 +	OPM to prepare comprehensive energy plan every four years (commencing 1/1/94)	draft plan for public comment issued 1993 -- never finalized; no other plans developed
16a-36	1977 +	state buildings cannot be artificially cooled below 78ºF	compliance not monitored
16a-36a	1981	state buildings cannot be artificially heated above 65ºF	compliance not monitored and other statutes require day care centers and some private facilities to maintain temperatures of 68ºF+
16a-37a	1990	set up program requiring electric service companies to retrofit lights in state buildings to save $4 million	electric companies spent ~$15M on projects that produced estimated annual savings of ~$4M and lifetime savings of ~$60M -- work was coordinated by DPW; repealed effective 10/1/02
16a-37c	1990	OPM to establish incentive program for state agencies achieving savings through energy conservation, with 50%+ of savings retained by agency for future energy costs/activities -- OPM to adopt regulations	regulations effective December 1991; no agencies ever applied to the program
16a-37d	1991, 1993	required electric/gas service companies to develop plans to improve energy performance in state buildings -- costs shared equally by companies and the State, but work performed by the companies	DPW received ~$13M in bond funds for this program -- completed projects will produce estimated lifetime savings of more than $61M

APPENDIX C. State Agency Compliance with Major Energy- Related Statutes Concerning State Government Operations.			
C.G.S. Sec.	***Adopted***	***Major Requirements***	***Current Status***
16a-37u	1981 +	OPM to: (a) plan/manage energy use in state buildings and require program to maximize energy efficiency -- also prepare/implement annual/long-range plans, coordinate federal/state conservation resources/activities and monitor agency energy use/costs on monthly basis (b) report annually re: energy and technical audits, status of conservation measures, and summarizing life-cycle cost analyses (per Sec. 16a -38) (c) with DPW, connect (as soon as practicable) state-owned buildings to a district heating/ cooling system (if available) and report progress annually (d) require state agencies to maximize use of public service company energy conservation programs and provide sites for energy efficient equipment demos	(a) interval metering project coordinated by OPM helps agencies track electricity use; OPM annually prepares/updates State Energy Plan to obtain federal funding; collects facility energy usage data from state agencies on monthly basis (b) OPM submitted report in January 1993 indicating 954 energy audits completed and 645 buildings received technical assistance audits between 1978 and 1992 (c) ~10 buildings in Hartford are connected (d) since 1990, the state has received $35M in conservation work from electric and natural gas companies under several different programs; in 2002, DPW to receive $1M per month from Energy Conservation & Load Management Fund (see 16-245m)
16a-38	1977	OPM and DPW to establish standards for life-cycle cost analyses for state owned/leased buildings and mandates such analyses in certain situations	DPW developed procedures/standards for life-cycle cost analyses -- OPM only gets involved if contacted by DPW
16a-38a	1979 +	DPW to conduct energy audits of all state-owned buildings; review audits and recommend buildings for cost-effective retrofit, completing 20% of floor area annually and all by 6/30/91; give preference to buildings that meet energy performance standards when selecting lease space; and with OPM, develop guidelines for energy efficiency maintenance program for state buildings	by January 1993, DPW had completed 954 energy audits and 645 buildings had received technical assistance audits; consideration given to energy performance levels when selecting leased space varies
16a-38e	1980, 1991	DPW to adopt standards for designating energy-saving capital projects as priority energy projects -- report by 1/1/92 on projects initiated	regulations effective December 1981
16a-38h	1983, 1987	DPW forbidden to execute leases for 10,000+ sq. ft. of new space (after 7/1/84) unless owner has energy audit conducted and implements improvements	compliance not routinely confirmed

APPENDIX C. State Agency Compliance with Major Energy- Related Statutes Concerning State Government Operations.			
C.G.S. Sec.	***Adopted***	***Major Requirements***	***Current Status***
16a-38i	1990, 1997	DPW (with OPM) to annually calculate average energy use per sq. ft. in state buildings, establish acceptable energy use thresholds, and reduce energy use on cost-effective, life-cycle basis (within available fiscal resources) in DPW controlled buildings that do not meet thresholds	DPW calculated average cost per sq. ft. for some large buildings under its control at least once, and data are available to determine numbers for additional buildings for past two years -- access to software that would expedite the computation process and calculate Btus per sq. ft. is being investigated; target thresholds are based on industry averages for various types of buildings as compiled by several national associations
16a-38j	1991 +	DPW (with OPM) to adopt regulations establishing criteria for selection of equipment for state buildings	no regulations adopted
16a-39a	1984 +	OPM (with DPW) to designate state agency for pilot energy conservation management program -- after review by Sec. 16a-39b task force, contract for improvements/ services for amount ≤ savings	OPM submitted update reports in January 1989 and 1993 describing steps taken to set up pilot project; repealed effective 10/1/02
16a-39b	1985 +	established *Task Force on Development of Incentives for Conserving Energy in State Buildings* -- report annually to General Assembly	stopped formal meetings FY 89, but OPM filed progress reports 1990, 1991, 1992, and 1993 -- latter document noted same information provided in Sec. 16a-37u(b) report (however, that report no longer prepared either)

Note: In the *Year Adopted* column, a "+" indicates the statute was modified in subsequent years.

Glossary: DAS = Department of Administrative Services DCP = Department of Consumer Protection DOT = Department of Transportation DPW = Department of Public Works OPM = Office of Policy and Management RFP = Request for Proposals M = million

Sources of data: Connecticut General Statutes, program review staff analysis of identified reports, and interviews with state agency personnel

Appendix D

Energy-Related Group-Purchasing Opportunities

Connecticut state agencies can use procurement contracts negotiated by the Department of Administrative Services to obtain energy-related commodities including:

- natural gas;
- fuel oil -- No. 1, No. 2, No. 4, and No. 6;
- propane;
- gasoline;
- diesel and bio-diesel fuel; and
- aviation gasoline and jet fuel.

The state purchases all of the commodities listed above, except natural gas, using the same type of procedures to select vendors and set prices that it uses for other traditional commodities. The process for purchasing natural gas is described in detail below. Also presented is a description of the state's efforts to set up an electric purchasing pool.

Natural Gas Procurement Assistance

Currently, 19 state agencies purchase natural gas supplies under a state procurement services contract. The Office of Policy and Management administers the program in conjunction with the Department of Administrative Services, the agency statutorily authorized to contract for goods and services on behalf of the state.

The current contract covers state fiscal years 2002 and 2003. Like other DAS contracts for commodities, the natural gas contract is a competitively bid, multi-year agreement available for use by multiple state agencies. The contract allows participating state agencies to obtain natural gas supplies under a group, firm[1] contract price negotiated by OPM and DAS. In addition, the billing process is simplified.

OPM estimates the quantity of natural gas consumed by the agencies currently participating in the program represents nearly 85 percent of the total amount of natural gas used by state agencies on firm (rather than interruptible) service agreements.[2]

[1] There are two pricing structures for natural gas -- firm and interruptible. Under a "firm" contract, the customer receives a continuous flow of fuel from its local utility company. "Interruptible" rates are available to customers who have an alternative source of fuel available to use in place of natural gas. These customers pay a lower rate, but they are required to switch over to their alternative fuel under specific circumstances. Under manual interruptible contracts, once a customer is told to switch over, they have a contractually established amount of time, generally several hours, to make the change. Under automatic interruptible contracts, the system is set up to change over upon a pre-set trigger, such as an external temperature.

[2] Based on OPM consumption monitoring data, participating agencies consumed approximately one-third of all of the natural gas purchased by the state in FY 00.

OPM estimates the state saved $3.2 million since the start of the program in 1997. Until FY 02, annual percentage savings ranged from 12 to 22 percent of the dollars the state would have spent for participating accounts, if there was no contract. In FY 02, the state paid 16 percent more.

Pilot program. The idea for the natural gas procurement program dates to 1996 when OPM got involved with a DPUC informational docket related to the deregulation of natural gas. DPUC wanted to allow the use of competitive suppliers for commercial and industrial accounts. OPM became involved from the perspective of the state as a consumer of energy rather than as a policy maker.

At that time, most state agencies dealt directly with local utilities and made their own arrangements to obtain natural gas. (The Department of Public Works handles energy procurement for some agencies, while others in rented space receive their energy supplies as part of their lease arrangements.) Agencies with facilities in more than one portion of the state might deal with as many as three natural gas utility companies.

For the pilot phase of the program, OPM sought to contract with a third-party supplier to serve a few state agencies on firm contracts. Although this competitively bid contract began in mid-1996, agencies did not actually begin receiving gas supplies until January 1997. The three agencies participating in the pilot program were the military and judicial departments and the community-technical college system.

To keep the process simple during the initial phase of the program, the pilot contract used the "burner tip" method to calculate the cost of the natural gas being purchased. Under this type of pricing, the costs of the two components of natural gas -- the price of the commodity itself and the utility's fee for transportation -- are combined into a single rate.

Under the pilot contract, the third-party contractor -- Duke Energy -- sent each participating state agency a monthly bill for the total cost of the natural gas used. After the agency paid the bill, the contractor was responsible for paying the utility company its portion of the bill. (Increases in either component of the price had to be absorbed by the third-party contractor, while savings from decreases were retained by the contractor.)

Following the pilot effort, OPM teamed with DAS for the next contract cycle. OPM was responsible for the technical aspects of the proposal, while DAS provided legal backup and its purchasing authority.

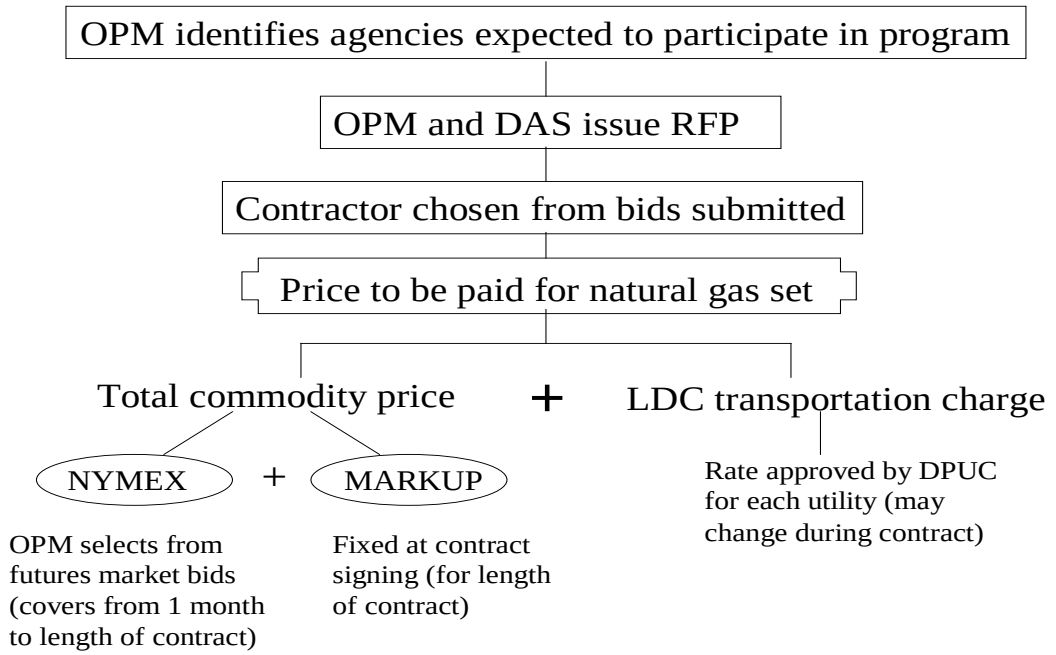
The pilot contract with Duke Energy was extended to continue serving the agencies already covered under it, but the pricing was re-established. A new contract, also using the burner tip method of pricing, was awarded to Energy Vision for service to seven more agencies. The prices charged under the two contracts differed to reflect the usage of the agencies covered under each contract.

Change in pricing method. In the private sector when a customer seeks bids for natural gas, commonly only the cost of the commodity -- the deregulated portion of the equation -- is put out to bid. The transportation cost charged by the local utility, based on DPUC approved rates, is billed separately. (This latter charge varies by utility company.)

In 1999, when the State issued the request for proposal for the next natural gas contract, a variation of this more common pricing method was used. The commodity price was separated into its two sub-parts -- the NYMEX cost and the fixed MARKUP. The sum of the two components is called the total commodity price. When that price is added to the pass-through cost from the utility for its transportation services, it represents the total price the state pays the contractor per unit of measure.

The NYMEX component is the price per CCF (i.e., hundred cubic feet) posted by the New York Mercantile Exchange for future purchases of natural gas. Prices move up and down throughout the trading day in response to anticipated supply and demand for immediate and long-range time periods. Changes in the prices reflect expectations about future events such as regional temperatures, forecasted snow or tropical storms, and economic conditions. Figure D-1 summarizes the process.

FIG. D-1. Natural Gas Procurement Contract Process



Under the state's contract, OPM analyzes the marketplace to target natural gas prices for specific time periods, which can range from one month to the length of the contract.[3] When the NYMEX futures price reaches the level OPM has decided on, that price is locked-in.[4] If OPM

[3] OPM uses an ad hoc working committee with representatives from OPM, DAS, the Connecticut Business and Industry Association, and the contractor to analyze technical information about the natural gas marketplace for the heating and cooling seasons covered by the contract.

[4] If the NYMEX price should increase prior to the time a locked-in rate will apply, the state cannot be charged more than the locked-in price. If the NYMEX price should decrease by the time the fuel is to be consumed, the state will still be required to pay the locked-in rate.

has not locked-in a NYMEX price at least four days before the month that is about to begin, then a "default" price is set. The default price is the average of the final three daily settlement prices for the NYMEX futures contract for the delivery month.

The MARKUP rate is a set amount identified during the bidding process. It covers the supplier's handling costs, including applicable taxes and administrative expenses. The specific price is agreed upon when the contract is awarded, and it applies for the duration of the contract.

At the request of participating agencies, OPM retained the single billing requirement of the pilot contract. Although the state must pay the DPUC approved rate for the local utility's transportation component of the fuel, the third-party supplier was required to handle billing and payment of the pass-through charges. Under this system, the utility sends the actual bill to the contractor, but a copy is also sent to the state agency consuming the fuel. The contractor then provides each participating state agency with a single monthly bill showing the total cost of the fuel used as well as the portion attributable to each element.

The current contract, awarded in February 2001, uses the same pricing method, but requires revisions in the billing process and format. Specifically, the contractor must provide participating agencies with more information regarding previous balances, payments, and adjustments as well as current charges, including time period, quantity consumed, and pricing by component. The information is to be presented by service location, but upon request, the contractor must be able to provide each agency with a single invoice summarizing all of its accounts and meters.

Table D-1 summarizes the key elements of the natural gas contracts issued to date. The current contract expires at the end of FY 03.

TABLE D-1. Summary of Natural Gas Procurement Contracts.

Time Period	*Contractor*	*Pricing Method*	*Agencies*
January 1997 - April 30, 1998 [pilot contract with OPM]	Duke Energy (Houston, TX)	Burner tip	3
May 1, 1998 - July 31, 1999	Duke Energy	Burner tip	5
May 1, 1998 - July 31, 1999	Energy Vision	Burner tip	7
August 1, 1999 - July 31, 2001	Conectiv/CNE Energy Services (Bgpt., CT)	[NYMEX + fixed MARKUP = total commodity price] + utilities' LDC transportation services cost	19
April 1, 2001 - June 30, 2003 (but gas supply commences August 1, 2001)	Energy East Solutions* (Bridgeport, CT)	[NYMEX + MARKUP] + LDC	19

NYMEX = New York Mercantile Exchange

LDC = local distribution carrier

* Energy East Solutions acquired CNE Energy Services in 1999.

Participation. The number of participants in the natural gas procurement program has increased from three state agencies to 19 (covering 32 locations). Table D-2 later in this section lists the participating agencies.

When the natural gas contract is put out to bid, OPM includes energy usage data for the agencies expected to participate. This provides the contractor with an estimate of the natural gas the participating agencies will need during the upcoming year. Updates are sent periodically to reflect accounts being added as well as reductions for facilities already closed or about to close.

Under the contract, new locations can be added at any time. Agencies already included under the contract on the starting date can add additional accounts and meters to the contract for the same price that the parent agency pays. New agencies joining the contract after it is underway receive a price based on market conditions at the time they join.

Municipal agencies can also purchase natural gas under the state contract, although none have. If any do sign up, they would be treated like a "new" state agency for pricing purposes.[5]

Billing issues. A simplified billing system for participating state agencies is a secondary goal of the natural gas procurement program. Achieving that goal has required OPM staff to expend considerable time since the start of the program resolving billing issues.

An early complication arose over the mechanism for paying the third-party contractor. State accounting procedures allow utility bills to be paid using a reservation account rather than a purchase order. However, the comptroller's (and some agency) computer systems did not recognize the third-party contractor as an entity eligible for payment under the reservation system because it was not a utility company. This issue was finally resolved in 2001. Under the newest natural gas procurement contract, agencies have been allowed to use the reservation system to pay for purchases under the natural gas contract.

When agencies initially begin participating in the program, there is sometimes confusion about the documents they receive from their local utility. Under the state contract, the utility sends the bill for each agency to the contractor, but the utility also sends a copy of the bill to the agency. This led some agencies to pay the utility directly based on the copy and then not pay the contractor when the actual bill arrived, or the agency paid the bill twice.

OPM also receives copies of the bills from the utilities. In some cases, OPM identified overcharges, resulting in credits for the agencies involved. For the past few contracts, agencies with multiple locations have been able to use one check to pay for all of their accounts.

Another billing-related problem concerned the time frames covered by the bills sent by the contractor. An invoice might cover fees for different months for different components of the bill. For example, the supplier might be billing for the most recent month of fuel consumption,

[5] In preparation for the second contract in 1999, OPM specifically invited the Boards of Education in the 10 towns that spend the most on natural gas to join the bid process. Three towns -- Hartford, New Britain, and West Hartford -- expressed interest, but in the end all declined to participate in the contract. Since then, several regional planning agencies -- the Capital Region Council of Governments and the Greater New Haven Regional Planning Agency -- have set up purchasing groups similar to the one operated by the state, and local municipalities are joining those.

while the utility charge might be for an earlier month because of a delay in the contractor receiving that bill.

Mixed time periods in the bills can affect the way agencies post the information to their billing system. It can also affect analysis of expenditures and consumption data. For example, the state consumption monitoring system tracks the usage of various fuels on a monthly basis. It needs to receive data according to when the fuel was used, not when it was billed or paid for.

New billing requirements in the current contract require the contractor to specify in greater detail the information participating agencies receive and the timeliness of payments to utilities. Although these requirements may have increased the cost of the MARKUP component of the contract, OPM anticipates the changes will reduce future billing problems. Combined with additional training of the fiscal staff of the participating agencies (in order to improve their understanding of the program), OPM expects to be able to reduce the staff resources it has assigned to this program.

Other issues. Several other issues have arisen as a result of the state moving away from a system of obtaining natural gas directly from a utility to one involving a deregulated supplier.

DPUC requires customers using a third-party supplier to have a telecommunications line attached to each gas meter so the local utility can continue to monitor usage. Installation and maintenance of such lines to some sites (e.g., manholes in the street or a greenhouse) can be costly. This policy is currently under review by DPUC, which has already modified it to exempt meters for accounts that consume less than a certain quantity of fuel. Business managers in participating agencies also need to be informed of this requirement to insure they do not take steps to disconnect the telephones as unused.

The state needs to decide whether all state agencies that use natural gas should be encouraged or required to participate in the contract. Because of the variability in the quantity of fuel consumed by agencies and the rates charged by area utilities, it is not always cheaper for agencies to procure natural gas through the procurement contract.

In a related area, a decision has to be made about how to deal with agencies on interruptible contracts for natural gas service. Since rates for these customers are traditionally low, it is difficult for the state to enter into a procurement contract that will offer a pricing structure that can produce additional savings.

Savings. OPM calculates the benefits of the natural gas procurement contract monthly. Savings are determined by comparing the price paid for natural gas under the contract with what the same quantity of fuel would have cost if it had been purchased directly from the local utility company during the same time period.

The goal of the program is to attain overall dollar savings for the state, factoring in the results from all of the participating agencies. While some agencies achieve substantial savings, others may not save any money, and a few may even pay more.

The potential for savings varies by geographic region. Three natural gas utilities operate in Connecticut, and the rates they charge vary. Agencies with accounts in Yankee Gas territory

will have the easiest time saving money under the procurement contract. Customers of Connecticut Natural Gas will have the hardest time, because the existing rates of that company are more competitive. (Southern Connecticut Gas -- the third company -- falls in the middle.)

OPM does not calculate non-fuel savings, but agencies do attain other benefits from participating in this program. In addition to the more efficient bill paying system discussed above, some agencies have consolidated the meters in their facilities, thereby reducing the monthly fees they pay for such equipment. Involvement in the program has also enabled agency personnel to better understand fuel pricing and given them experience working with suppliers of a less traditional commodity.

In FY 01, participating agencies spent $10.4 million for natural gas under the contract. OPM estimates the same quantities of fuel purchased outside the contract would have cost those agencies $11.9 million, for a savings of 13 percent. In FY 02, contract expenditures totaled $9.7 million versus $8.4 million if purchased outside the contract, for an additional cost of 16 percent. Table D-2 presents estimated annual savings by agency since FY 98.

TABLE D-2. Estimated Savings for Agencies Participating in Natural Gas Contract.

Agency	*Joined*	*FY98*	*FY99*	*FY00*	*FY 01*	*FY 02*
Agricultural Exper. Station	FY 99		$1,735	$2,988	$1,358	($875)
Comm.-Tech. Colleges	FY 97	$34,453	$35,793	$49,223	$26,155	($45,121)
Fire Prevention/Control	FY 99		$15,993	$12,061	$6,755	($7,715)
CT State University	FY 00			$22,293	$31,945	($33,111)
Admin. Services	FY 00				($480)	($4,465)
Children & Families	FY 00			$31,728	$26,080	($19,630)
Correction	FY 98	$90,747	$549,031	$1,208,460	$1,060,243	($338,889)
Education	FY 98	$13,590	$87,440	$167,779	$129,255	($189,038)
Labor	FY 00			$8,056	$5,158	($11,900)
Mental Health & Addiction Services	FY 00			$1,444	($2,846)	($10,729)
Mental Retardation: Southwest and Northwest	FY 99		$8,284	$32,425	$21,403	($330,165)
Motor Vehicles	FY 98	$1,704	$17,435	$8,719	$6,964	($5,618)
Public Safety	FY 00			$23,446	$18,069	($9,655)
Public Works (partial)	FY 00			$1,622	($674)	($7,187)
Transportation (includes Bradley Intl. Airport)	FY 99		$70,743	$97,030	$55,224	($52,722)
Veterans' Affairs	FY 98	$143	$750	$254	$128	$141
Judicial	FY 97	$62,487	$40,756	$102,017	$77,012	($149,192)
Military	FY 97	$31,118	$52,205	$67,945	$50,446	($57,511)
UConn Health Center	FY 98	($41)	$2,561	$8,902	$2,123	($40,732)
TOTAL		**$234,201**	**$882,726**	**$1,846,392**	**$1,514,318**	**($1,314,114)**

Only six months of data are available for FY 97 because the program did not begin until January 1997. Participating agencies saved $33,123: Comm-Tech Colleges $15,255; Judicial $10,210; and Military $7,658.

Source of data: Office of Policy and Management

Electric Procurement Program

Under C.G.S. Sec. 16a-14e, the Office of Policy and Management is required to operate a purchasing pool for the purchase of electricity for state operations. In 1998, OPM issued an RFP and hired a consultant -- Strategic Power Management -- to conduct an aggregation study to identify, quantify, and profile state government's aggregated electric load (including historical usage and peak demand).

The study, which took about six months, found approximately 3,500 accounts. Not all of the accounts were subject to deregulation because some were customers of municipal electric utilities. In addition, three state entities -- the University of Connecticut, Eastern Connecticut State University, and Western Connecticut State University -- had entered into special contracts with their local electric utility, Connecticut Light & Power Co., that precluded them from participating in the state program immediately.[6]

Once existing state electric accounts were identified, actual usage data had to be compiled. In addition, an assessment was made of the effect of the state of Connecticut becoming a single, unified electric customer. Based on the analysis by the consultant, it was determined that overall the state would fare better as one combined customer rather than a number of smaller customers. This analysis did not factor in the cross-subsidization issue wherein some agencies in a group purchasing pool save, while others do not.

In December 1999, DAS issued an RFP for an electric procurement contract.[7] Bids were due in February 2000.

Although there was a lot of interest in the purchasing pool concept and a number of people attended the mandatory bidders conference, only two bids were actually received. One arrived late and was disqualified for that reason. The other arrived on time, but it was rejected for failing to fulfill the bid requirements. Specifically, the proposed price was valid for only a portion of the time frame the bid was to cover, and some agencies specified in the RFP were excluded from eligibility to make purchases at the bid price.

After rejecting both bids, OPM terminated the RFP process and undertook a discussion with industry representatives about the program concept. It wanted to find out which elements of the bid specifications had created problems. In addition, OPM wanted to understand the status of electric deregulation issues in general and how changes in the overall marketplace would affect the state's efforts to successfully establish a combined purchasing pool.

Based on those discussions, OPM identified several problems that may affect efforts to re-bid the contract. The first issue is the Connecticut standard offer.[8] Potential bidders said the

[6] As a precursor to electric deregulation, DPUC allowed electric utility companies to enter into agreements with some customers to provide reduced rates in exchange for undertaking conservation efforts and equipment upgrades.

[7] Although the statute establishing the program specifies OPM will operate it, OPM does not otherwise have specific purchasing authority. Therefore, it chose to work with DAS on this contract in the same way it does on the natural gas procurement program.

[8] Under C.G.S. Sec. 16-244c, an electric distribution company must make electric generation and distribution services available to all customers in its distribution area through a "standard offer," set by DPUC for each

"default" price charged by CL&P or United Illuminating under the mandated standard offer through 2003 is so low it is difficult for them to offer a lower price through the competitive bid process.

Some people suggested the state's RFP should include a "green" component as a requirement. Under the current law, this would allow companies to place a higher price on that portion of electricity supplied, providing an opportunity to build in some profit.

The timing of the initial RFP with respect to supplies was also an issue. The bid request preceded an infusion of new capacity expected to come on-line after 2001. If the marketplace works as envisioned by the electric deregulation law, the availability of these new generation supplies should increase competition and decrease prices. Until then, the closeness of the levels of anticipated demand and existing supply keeps prices within a narrow range.

Another element of the contract requirements that created a challenge for potential bidders was the statutory mandate that any household with an individual who receives state or federal means-tested assistance has to be given an opportunity to participate in the state purchasing pool. Under the statute, households participating in the state pool must receive the same benefits and rate discounts as those available to state facilities. Among the concerns raised were:

- how to define "same benefits;"
- which of the multiple rate classes used by the state for its various accounts would be chosen for these residential customers;
- which of the multiple eligibility requirements used for various state and federal government assistance programs would be chosen to determine eligibility for participation in the State pool;
- how to estimate the number of households that would choose to participate;
- responsibility for unpaid bills; and
- how to handle the possibility that participation in the program might end up costing a household more than if it had purchased electricity outside the pool.

An additional issue OPM is examining is the billing process that will be used for the electricity contract. Based on state agencies' experiences with the natural gas contract, some invoice and payment problems can be anticipated initially when agencies switch to a commodities contract for electricity. Because there is more variability in the pricing of electricity and more money is spent on it, greater efforts may be needed to educate individual agency personnel on interpreting and monitoring data received from the supplier.

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company. The standard offer provides that the total rate charged (including electric transmission and distribution services, the conservation and load management program, the renewable energy investment charge, electric generation services, the competitive transition assessment, and the systems benefits charge) must be at least 10 percent less than the base rates (defined as the total amount charged each class of customer for the fully bundled costs of electricity) in effect on December 31, 1996. This pricing formula expires January 1, 2004, unless it is extended by the legislature.

In September 2002, OPM issued an RFP to cooperatively purchase electric generation services for the state's approximately 300 unmetered street lighting accounts in the service territory of Connecticut Light & Power Co. (Annual consumption is estimated at 3.5 million kWh.) Bids are due in October 2002, with a targeted start date of no later than January 1, 2003.

The next attempt to set up a more comprehensive electric purchasing pool is expected to be announced in the second half of 2003. That RFP will seek to address problems identified with the scope of the first contracting effort. For example, the proposal may allow for the phase-in of the required residential component for individuals receiving means-tested assistance.

APPENDIX E

State Agency Duties Involving Energy-Related Aspects of State Government Operations

Agency	***Responsibilities Regarding Energy-Related Standards and Regulations***	***C.G.S. Sec.***
OPM and DPW	jointly establish/develop and publish: • standards for life-cycle cost analyses for buildings owned/leased by the state • energy performance standards for buildings owned/leased by the state • guidelines for energy efficiency maintenance program for state-owned buildings	 16a-38(b)(1) 16a-38 (i) 16a-38a(d)
OPM and DAS	may jointly establish and publish for equipment and appliances owned/leased by the state: • standards for life-cycle cost analyses • energy performance standards	 16a-38(b)(2) 16a-38(j)
OPM and DECD	jointly establish and publish energy performance standards and establish life-cycle cost analyses for buildings in state-financed housing projects	16a-38(f)
OPM	adopt regulations to carry out incentive program for agencies that achieve savings through energy conservation	16a-37c
DPW - consult OPM	adopt regulations establishing criteria for state agencies to use in selecting equipment for use in state buildings	16a-38j
DPW - consult OPM and advisory board	adopt regulations establishing lighting standards for all public buildings and upon adoption: • make random inspections of buildings to monitor compliance • may inspect any building against which complaint alleging violation is received • maintain list of public buildings in compliance with standards	16a-39
DPW	adopt regulations establishing standards for designating certain energy-saving capital projects as priority energy projects	16a-38e

Agency	*On-going Responsibilities Regarding Energy-Related Plans and Reports*	*C.G.S. Sec.*
OPM	prepare comprehensive energy plan every four years (starting 1994) -- hold regional hearings and submit to legislature	16a-35m
OPM	annually submit report to governor/legislature that: • indicates number of energy and technical assistance audits of state-owned/leased facilities • summarizes status of energy conservation measures recommended by audits and all energy conservation measures implemented in state facilities not audited • analyzes availability and allocation of funds for measures recommended by audits • lists budgeted agencies not cooperating with DPW/OPM in conducting audits and implementing changes • summarizes life-cycle cost analyses prepared under C.G.S. Sec. 16-38 • identifies state laws/regulations/procedures impeding innovative energy conservation and load management projects	16a-37u(b)
Conn. Energy Advisory Board	annually submit report to governor/legislature (odd years -- recommendations to address state's energy situation and bring supply/demand into balance; even years -- implementation of recommendations in reports under Sec. 16a-35 and additional recommendations to bring supply/demand into balance)	16a-7
Task Force on conserving energy in state bldgs.	review state statutes/regulations/policies/practices, analyze alternatives, and formulate recommendations in six specific areas related to energy conservation -- annually report findings/recommendations to legislature	16a-39b

Agency	*Responsibilities Regarding Energy-Related Purchases*	*C.G.S. Sec.*
DAS	adopt purchasing standards, including that vehicles using alternative fuels be considered when buying motor vehicles	4a-56
DAS	in determining lowest qualified responsible bidders, can give price preference of up to 10% for recycled products, motor vehicles powered by "clean alternative fuel" or conversion equipment allowing exclusive or dual use of alternative fuel	4a-59(c)
State agencies	• procure equipment/appliances that meet/exceed federal energy conservation standards in Energy Policy and Conservation Act • only purchase cars/trucks that meet certain gas mileage standards (some purchases of natural gas or electric vehicles also mandated) • only purchase limited types of replacement light bulbs	4a-67c 4a-67d 16a-37f
OPM	can waive requirement state-funded permanent, outdoor luminaires maximize energy conservation (and minimize light pollution), if life-cycle cost analysis indicates not cost effective nor most appropriate alternative	13a-110a

Agency	*Responsibilities Regarding Operation of Energy-Related Programs*	*C.G.S. Sec.*
OPM	• establish program to finance state agency projects to reduce costs and increase efficiencies • investigate complaints of violations of energy pricing, allocation, rationing, conservation, distribution, and consumption laws; coordinate government programs for allocation, rationing, distribution, and consumption of energy resources • operate purchasing pool for purchase of electricity for state operations -- allow households receiving means-tested assistance to participate • establish incentive program for agencies that achieve savings through energy conservation -- agency retains 50+% of savings for future energy costs or conservation activities for period equal to useful life of measures taken • plan/manage energy use in state-owned/leased buildings; require establishment of program to maximize efficiency of energy used -- prepare/implement annual/long-range plans, coordinate federal/state energy conservation resources/activities, and monitor energy use/costs by budgeted state agencies monthly	4-67f 16a-14 16a-14e 16a-37c 16a-37u(a)
OPM (with DPW)	connect, as soon as practicable, all state-owned buildings to a district heating/cooling system; annually report on progress, cost of connection, and projected energy savings achieved	16a-37u(c)
OPM (consult DPW)	designate state agency to select institution where pilot energy conservation management program will be conducted and contract with qualified contractor to implement improvements/services for amount of money ≤ energy savings realized	16a-39a
DPW (with OPM)	for energy performance standards: • annually calculate average energy use per sq. ft. in state buildings • establish thresholds of acceptability for energy use in state buildings • reduce energy use in DPW buildings on cost-effective, life-cycle basis (within available resources) • assist other agencies in reducing energy use in buildings under their control that do not meet thresholds	16a-38i
DPW	• conduct energy audits of all state-owned building -- complete preliminary audits by 7/1/80; use results to set priorities for subsequent audits at rate of 20% of total building floor space per year • issue decision schedule for each priority energy project within 60 days of designation	16a-38a(a) 16a-38g
State agencies	• report buildings with nonconforming temperatures at annual legislative budget presentation • submit life-cycle cost analyses prepared under Sec. 16a-38 to OPM • those with authority for energy-saving capital project designated as priority energy project provide DPW with "decision outline" 30 days after designation	16a-36 and 16a-36a 16a-38(h) 16a-38f
DOT	• coordinate development/operation of modern/safe/efficient/energy-conserving system of highway, mass transit, marine, and aviation facilities/services • prepare pertinent reports, including detailed reports of energy use analysis by mode of transportation	13b-4
CEAB	make recommendations re: programs for enhancing state's energy management and carrying out Sec. 16a-35k	16a-3

Agency	*Responsibilities Regarding Oversight of State Agency Energy-Related Actions*	*C.G.S. Sec.*
Innovations Review Panel	review funding requests (and submissions from employees for improving delivery of services or reducing agency costs)	4-67f
OPM and DECD	review life-cycle cost analysis of major Department of Housing projects to determine compliance with Sec. 16a-38(f)	16a-38(g)
DPW	review energy audits of state-owned building and recommend to OPM buildings for cost-effective retrofit measures	16a-38a(b)
OPM or DPW	• for major capital projects, DPW determine if life-cycle cost analysis complies with standards of 16a-38(b) • for non-major capital projects, either OPM or DPW may require life-cycle cost analysis	16a-38(e)
OPM and DPW	take actions to enable state facilities to meet energy performance standards established under Sec. 16a-38(b)(1)	16a-38b

Agency	*Responsibilities Re: Energy-Related Elements of State Facility Plan and Leasing/Purchasing Office Space*	*C.G.S. Sec.*
OPM	review cost-effective retrofit measures recommended by DPW and include in *State Facility Plan* measures that best attain energy performance standards of Sec. 16a-38(b)(1)	4b-23(a)
DPW	in implementing *State Facility Plan*, study each facility to determine (among other things) feasibility and cost of acquisition using life-cycle cost analysis	4b-23(e)
State agencies	for *State Facility Plan*, identify space modifications/relocations that could result in cost or energy savings	4b-23(a)
State Facility Plan	include policy to encourage own/lease modern buildings to achieve cost and energy efficiencies (among other goals)	4b-23(n)(5)
DPW	give preference to buildings that meet energy performance standards when selecting buildings to lease for state use	16a-38a(c)
DPW	forbidden from executing new leases for 10,000+ sq. ft. of space (not currently occupied by the State) unless owner had energy audit conducted and implemented operational/maintenance improvements, energy consumption data for two years preceding lease has been collected, and efficiency test of the building's boiler has been conducted	16a-38h
State agencies	cannot obtain preliminary design approval for major capital project unless commissioner of public works makes written determination design is cost effective on life-cycle basis	16a-38(c)
State agencies	ensure plans to construct/renovate/modify state-owned/occupied buildings provides portions of new buildings (or those constructed for the state) be served by renewable energy sources for heating/cooling, hot water, etc.	4b-23(m)

APPENDIX F

Agency Responses

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC WORKS

T. R. Anson
Commissioner

November 12, 2002

Senator Judith G. Freedman, Co-Chair
Representative Jack Malone, Co-Chair
Legislative Program Review and Investigations Committee
State Capitol, Room 506
Hartford, CT 06106

Dear Senator Freedman and Representative Malone:

Thank you for providing the Department of Public Works (DPW) with the opportunity to comment on the ***Energy Management by State Government*** study that was recently published by the committee (reference: *Draft Final Report for Agency Comment*, dated October 22, 2002). DPW wants to compliment the committee for undertaking the difficult and complex task of bringing together the many disparate factors that are involved with State energy policy and utilization. In particular, the department appreciates the staff work that was done by Ms. Anne McAloon in working with DPW on the collection of data and soliciting the department's perspective on the issues involved with energy matters. The study's format and content reflect a very professional approach to the subject under review.

Overall, DPW has no major concerns or issues with the factual content and recommendations contained in the study. The department fully supports the committee's statement that "… it is important the state continue its energy efficiency efforts" [Introduction, page 1]. DPW has been involved in these efforts in the past and is committed to providing technical support and total cooperation with the General Assembly and other agencies in the future. The department fully embraces an ethic based on energy efficiency and energy conservation.

In particular, DPW would call the committee's attention to the following points:

Energy Policies and Programs: DPW policy is to incorporate "sustainable" or "green" concepts into major capital projects (i.e., major renovations and new construction) by setting the LEED Silver Standard of the U. S. Green Building Council as the goal and implementing where feasible. DPW is requiring all architects and engineers to consider the LEED standards when designing projects for the state. (LEED = Leadership in Energy and Environmental Design.)

Life-Cycle Cost Analyses: DPW is committed to having a strong life-cycle cost analysis process. Additional factors that should be considered in the life-cycle submittals for major state capital projects include the following:

⇒ Consideration of using natural lighting ("daylight harvesting")
⇒ Consideration of use of passive solar design

⇒ Post-construction third-party certification that the building, as completed, has been built as designed for optimal life-cycle results (i.e., "building commissioning")
⇒ The only state buildings or facilities that should be exempted from life-cycle cost requirements are structures under 10,000 square feet.

Energy Performance Contracts: DPW has had extensive experience with the development of "energy performance contracts." The department closely examined the formats used by the Federal Government and the State of New York. DPW initiated a two-part selection process based on vendor qualifications and full project proposals. Lengthy negotiations were held with the selected firm. A draft contract that met the requirements of the Office of the Attorney General was prepared. DPW also solicited input from the Office of the State Treasurer and the Office of Policy and Management. Unfortunately, a satisfactory "business deal" with the contractor did not materialize and the RFP was rescinded. Based on the knowledge and experience gained from this endeavor, DPW is willing to make another attempt to do a "Pilot Energy Performance Contract" as the committee report recommends [page 21]. DPW also would suggest that the deadline for implementation of a pilot energy performance contract be extended to July 1, 2004. Such a timetable would allow DPW to carry out a fair, reasonable, and quality selection process involving the energy service contracting community.

Leasing: DPW understands the committee's concern with leased buildings being assessed for energy efficiency and upgraded if necessary prior to the state entering a formal contract with a building owner [pages 15, 18]. This concern will be addressed.

Coordination of State Energy Management Efforts, Energy Policies, and Programs: DPW emphasizes its commitment to work with and assist whatever agency is named as "the primary entity for coordinating state energy management efforts" [page 18]. DPW is prepared to continue offering technical review and analysis as well as program planning and implementation services.

Thank you for your consideration of the above-referenced ideas. Please do not hesitate to contact me if DPW can be of additional assistance to you.

Sincerely,

T. R. Anson
Commissioner

TRA/SM/AH/sb

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November 12, 2002

Mr. Michael L. Nauer
Director
Legislative Program Review and Investigations Committee
State Capitol
Room 506
Hartford, CT 06106

Dear Mr. Nauer:

On behalf of the Connecticut Energy Advisory Board (CEAB), I would like to respond to the Committee's recommendation that the "Connecticut Energy Advisory Board do an analysis of what would be the appropriate state entity to have responsibility for oversight of state energy policy". We on the board would welcome the opportunity to provide you with our thoughts on this matter and think we have the resources as well as the "institutional memory" to complete this charge. If you decide to move forward, we would like to discuss scope and schedule with you as soon as possible.

On a general note, we thought your report was particularly well done. It was an accurate and concise evaluation of past and current state conditions - you managed to distill what is usually an arcane topic down to something manageable and understandable. Kudos to you and your staff, especially Anne McAloon, with whom we have been working.

We look forward to hearing from you.

Sincerely,

Michael E. Cassella
Chairman
CEAB

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