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Report of the Task Force to Advance Energy Efficiency, Conservation and Independence at State Facilities

Alan Henry
Maine Bureau of General Services

Task Force to Advance Energy Efficiency, Conservation and Independence at State Facilities

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Report of the Task Force to Advance Energy Efficiency, Conservation and Independence at State Facilities

January, 2010

Respectfully submitted to the Governor, the Joint Standing Committee on State and Local Government, and the Joint Standing Committee on Utilities and Energy pursuant to 2009 Public Law, Chapter 372, Section I.

I.	Table of Contents	2
II.	Membership	3
III.	Executive summary	4
IV.	Overview of existing energy usage	6
V.	Success stories and achievements	11
VI.	Audit Findings and potential projects	15
VII.	Fiscal Options: Opportunities, Benefits and Costs	18
VIII.	Summary and proposals	20
IX.	Appendices	22
	A. Bureau of General Services	24
	B. Department of Corrections	32
	C. Defense, Veterans, and Emergency Management	36
	D. Department of Transportation	42
	E. LPB Energy Management	44
	F. Statutory charge excerpt	58
	G. State Energy Office Plan excerpt	60

II. Membership

The following is a list of the members of the Task Force established by the Commissioner of the Department of Administrative and Financial Services, pursuant to 2009 Public Law, Chapter 372, Part I.

Ryan Low, Commissioner, Department of Administrative and Financial Services, Chair
Chip Gavin, Director, Bureau of General Services, & designated Chair of the Task Force
Bill Black, Property Management Division, Bureau of General Services
Jeff Bond, Department of Defense, Veterans and Emergency Management
John Brautigam, Director, Efficiency Maine, Public Utilities Commission
Rick Buotte, Director, Property Management Division, Bureau of General Services
Michael Burns, Department of Transportation
Ian Burnes, Office of Energy Independence and Security
Jim Dusch, Department of Environmental Protection
Martha Freeman, Director, State Planning Office
Alan Henry, Bureau of General Services
John Kerry, Director, Office of Energy Independence and Security
Michael LeVert, State Economist
Mark McCarthy, Department of Corrections
Jennifer Puser, Office of Energy Independence and Security
Mark Roberts, Department of Defense, Veterans and Emergency Management
Tony VanDenBossche, State Planning Office

The Task Force also was assisted by Jennifer Merrow at the Bureau of General Services and Vicki Schiavo of LPB Energy Management.

III. Executive summary

The Task Force was first convened on August 20, 2009 and had three additional meetings on September 16, 2009; October 21, 2009; and December 8, 2009.

The Task Force meetings included a variety of relevant presentations, including presentations by major energy consuming Departments about their energy conservation programs, energy projects, energy monitoring and additional information. LPB Energy Management, the state's contracted energy procurement advisor, also provided a presentation. Those presentations and further information reviewed by the Task Force, such as applicable excerpts of the Office of Energy Independence and Security, are included as appendices to this report. The Task Force meetings included substantial opportunity for dialogue about the presentations and the issues they raised.

The best information available to the Task Force to Advance Energy Efficiency, Conservation and Independence at State Facilities (hereinafter referred to as "Task Force") shows that total facility-related energy costs at the executive branch departments and agencies of State government had not yet reached $15 million in fiscal year 2005 (FY05). Four years later, in FY09, these costs reached an all-time high of more than $24 million.

KEY RECOMMENDATIONS:

1. Reporting: Establish an annual report to document and readily communicate the energy consumption at these state facilities.
2. Cooperation and coordination: Continue efforts to advance coordination and cooperation among facility-intensive departments and agencies.
3. Investment: Create an opportunity and fiscal mechanism to invest in energy improvements specifically targeted at state facilities.

During this time period substantial efforts were made to conserve, improve energy efficiency, and otherwise reduce energy consumption. Significant efforts were also made to reduce the State's reliance on foreign oil for heating. As a result of these efforts, as well as other factors, Maine's statewide heating oil use at executive branch facilities was cut by an estimated 30%, and electricity use fell by an estimated 5% from FY05 to FY09. Maine also has used 100% renewable electricity for state facilities since 2007 pursuant to MRSA Title 5, Section 1766-A.

Despite such gains, the State's facilities remain largely reliant on imported heating oil and on electricity, generated at large off-site producers. Even with past substantial efforts to improve Maine's energy posture, the cost of energy – driven by tremendous price increases and volatility in the marketplace – has overwhelmed Maine's efforts and demands attention. This is to say nothing of the potential environmental or climate concerns that are raised by Maine's reliance on its current mix of energy sources.

This report argues that energy efficiency, conservation and independence at the executive branch facilities of State Government can be improved by a number of means: continuing to attack and reduce consumption; conducting important and too-easily overlooked energy

audits, diversifying the energy sources used at these facilities; reducing reliance on imported heating oil; and increasing the use of alternative and cost-effective renewable energy sources when possible.

The Task Force believes that progress toward improving the State's performance relative to its conclusions can be advanced by following three fundamental recommendations, which are further discussed in section VIII. This report recommends that Maine should:

1. **Reporting:** Establish an annual report to document and readily communicate the energy consumption at these state facilities.

2. **Cooperation and coordination:** Continue efforts to advance coordination and cooperation among facility-intensive departments and agencies.

3. **Investment:** Create an opportunity and fiscal mechanism to invest in energy improvements specifically targeted at state facilities.

Adoption and implementation of the Task Force's recommendations will place these State government facilities and Maine policymakers in a position to achieve long-term, sustainable energy success by providing necessary information, tools, communication and resources to the individuals charged with using them effectively.

IV. Overview of existing consumption and costs at state owned and managed facilities

The State of Maine has made significant strides to reduce the consumption and the cost of energy at the state-owned and operated facilities of executive branch departments and agencies.

Statewide heating oil use has decreased by an estimated 30% and electricity use decreased by an estimated 5% during the FY05 - FY09 period across these facilities. This reduction is attributable to a number of factors, including conservation, efficiency investments, changes in fuel types, and changes in the amount and kind of space being heated. While the accumulation of innumerable modest steps may sometimes seem small on their own, such as little-noticed improvements to the controls on heating and ventilation systems or improvements to lighting controls, when aggregated those changes make a difference.

While consumption has been declining, Maine has experienced substantial increases and tremendous volatility in the cost of energy in the marketplace. Fuel oil costs have increased by 183% between FY05 and FY09 and electricity costs increased by 67%. Maine State Government can anticipate a drop in total energy costs in FY10 compared with FY09 due to a general easing of heating oil prices in the market, coupled with the State's monitoring of those various energy markets to secure the best possible price and its continued efforts to cut consumption.

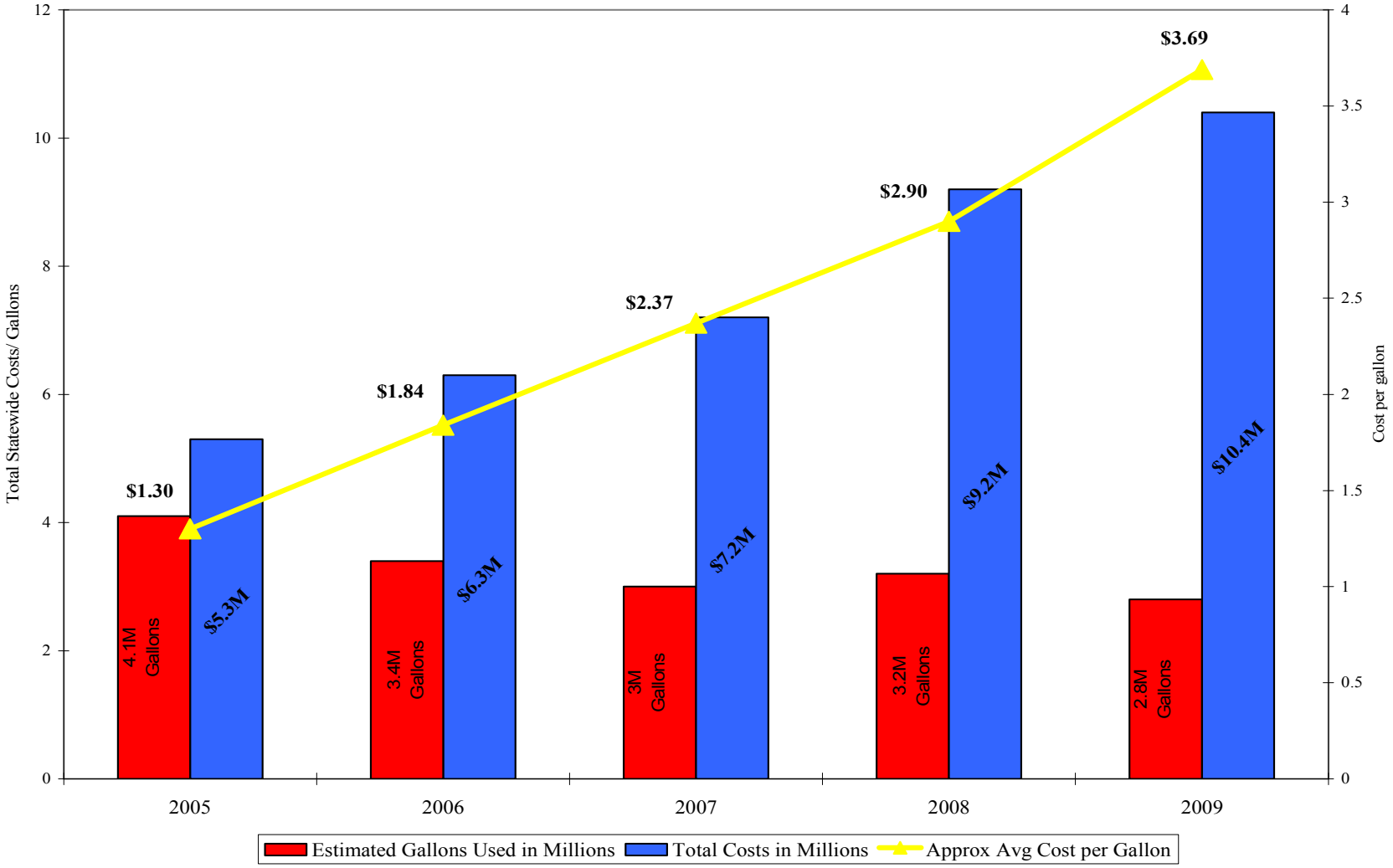
Several graphs appear on the following pages.

Graph 1 on page 7 summarizes the estimated decline in heating oil consumption but the dramatic increase in the associated prices and costs.

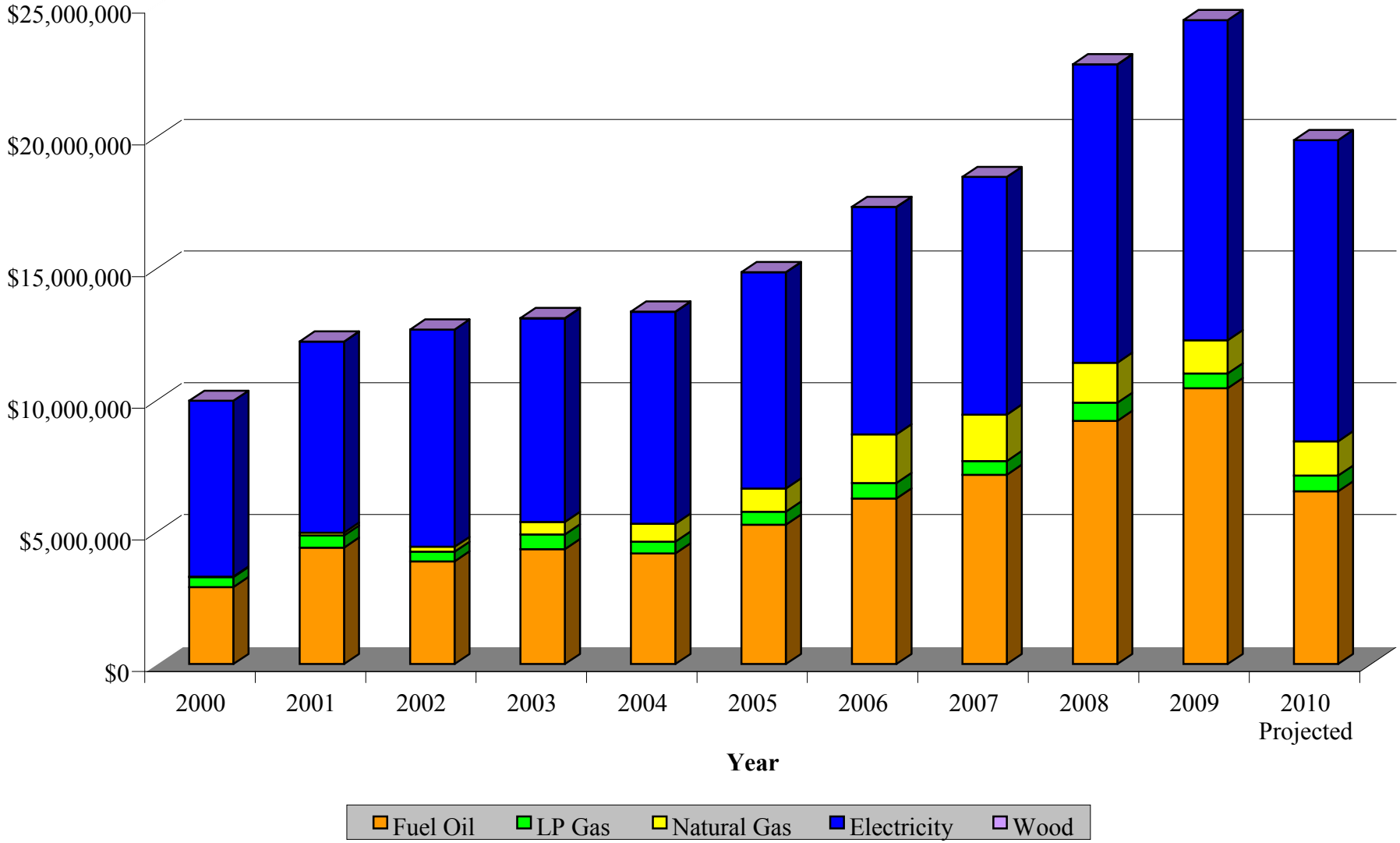
Graph 2 on page 8 illustrates total energy costs at the facilities covered by this report, the types of energy being purchased, and how those costs have increased over time.

Graph 3 on page 9 shows similar information to graph 2, but uses only FY09 so the information can be provided in greater detail. This graph shows in FY09 the State of Maine expended approximately $24.4 million in energy costs at state owned and managed facilities of the Executive Branch. These costs are associated with purchasing Fuel Oil, Electricity, Natural Gas, Liquid Propane and Wood products. The State of Maine expended $10.5 million on fuel oil at an average rate of approximately $3.69 per gallon a total statewide usage of 2.8 million gallons, combining No. 2 heating oil and B5 heating fuel oil. The total cost for electricity was approximately $12.1 million, accounting for both standard offer and contracted purchasing. The statewide average cost of electricity was a fully-burdened rate of $0.146 cents per kilowatt hour purchased in FY09. The natural gas total purchase was $1.3 million, while an additional $555,000 was spent on liquid propane. Wood products totaled $4,294.00 in fiscal year 2009, and that amount is expected to increase.

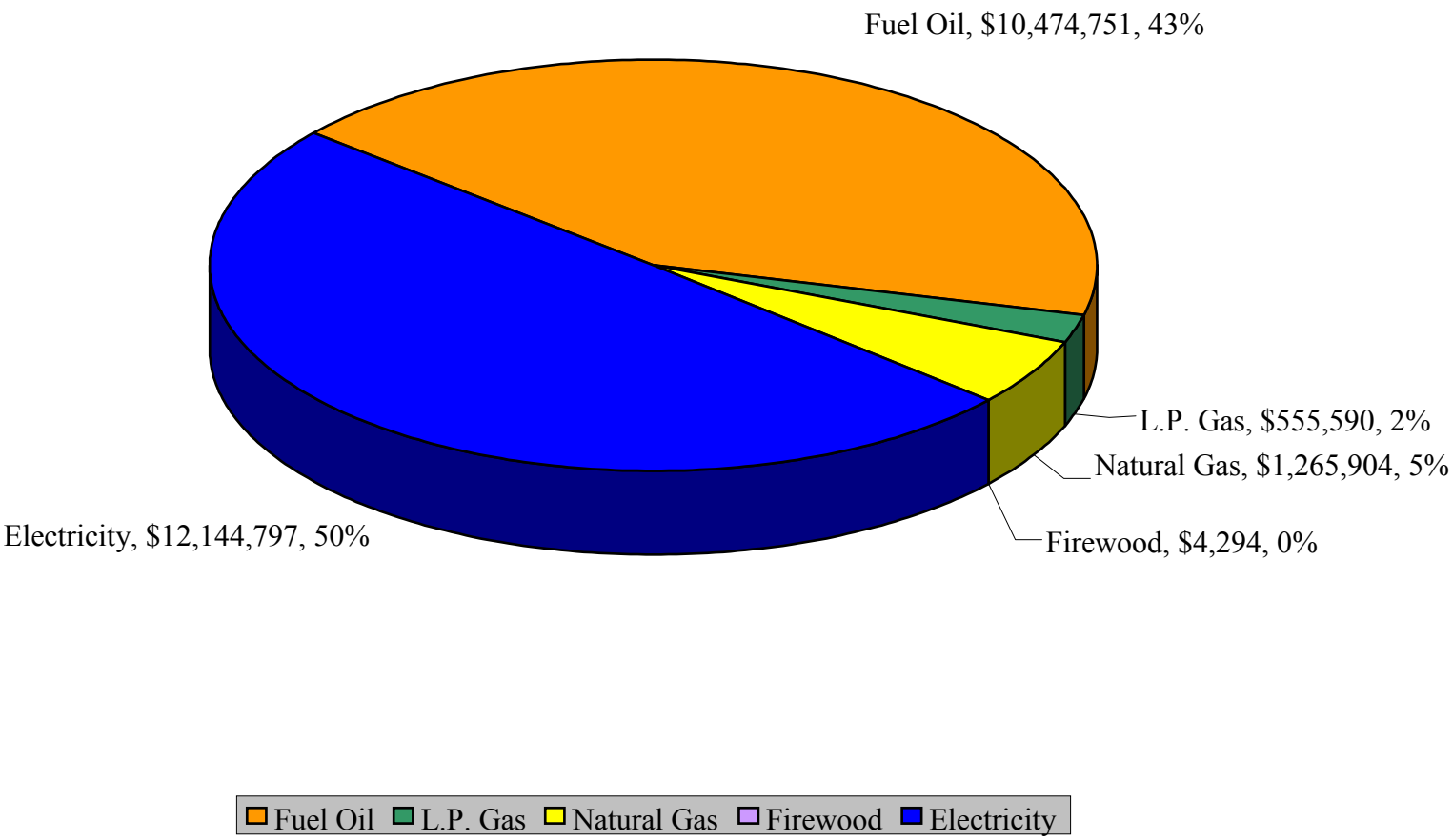
Statewide Fuel Oil
Graph 1



Building Energy Costs Over Time
Graph 2



FY2009 Costs by Type of Energy
Graph 3

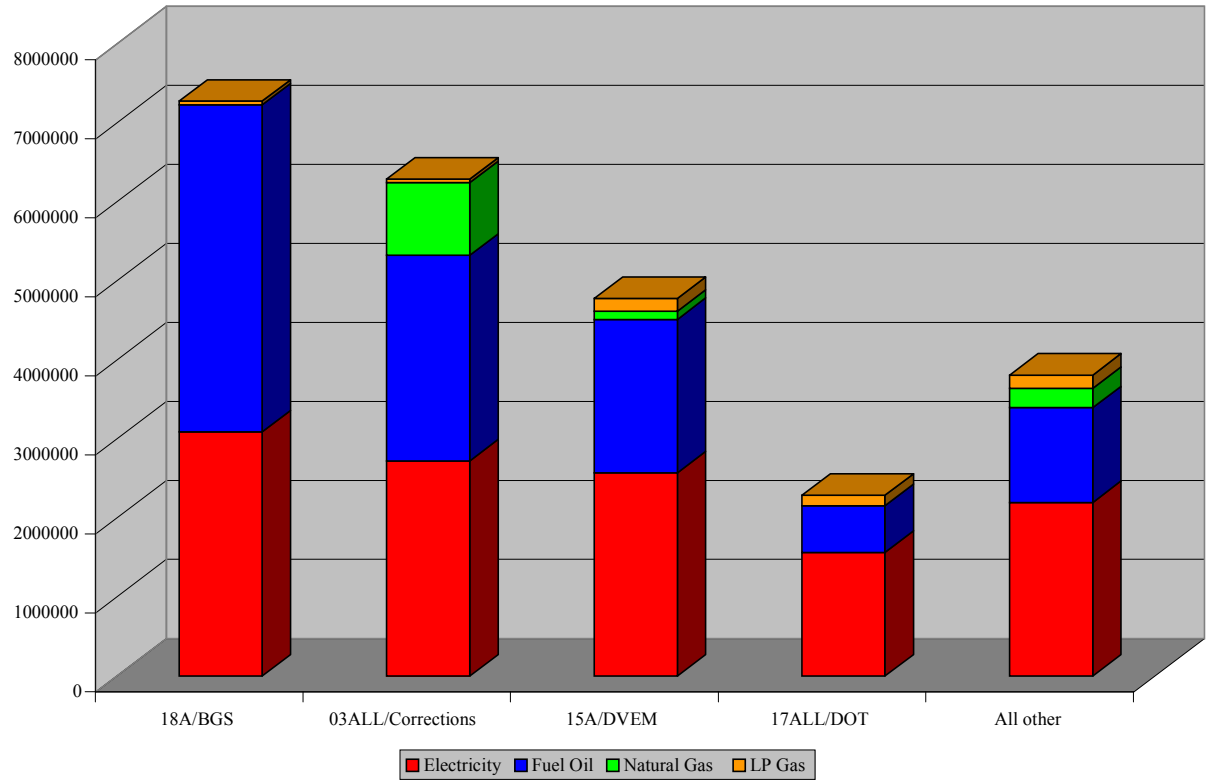


Within the facilities of State government, four departments account for approximately 85% of all the state-owned facility-related energy as measured by energy costs.

The Bureau of General Services, which manages facilities through its Property Management Division and Leased Space Division for multiple departments and agencies, is the largest single consumer of energy of any department. The single largest energy consuming location is the East Campus of State Government, which is managed by the Bureau of General Services. That campus, for example, consumes approximately 425,000 gallons annually of heating fuel, and is currently being studied for a fuel conversion initiative and a possible so-called cogeneration or tri-generation project in which the campus would capture waste heat to generate its own electricity. Overall, including the East campus, the Bureau of General Services consumed $7.3 million in energy or almost 30 percent of the total expended in FY09.

The Department of Corrections is the next largest user of facility-related energy, consuming $6.3 million nearly 26 percent of the total. The Department of Defense, Veterans and Emergency Management is the third largest consumer of energy at $4.8 million or more than 19 percent of the total. The Department of Transportation is the fourth largest single consumer at $2.3 million or a little more than 9 percent of the total amount used. The remaining departments and agencies all together consumed $3.8 million or about 15-16 percent. This information is summarized below in Graph 4.

Energy Usage by Department FY2009
Graph 4



V. Success stories and achievements

While much work remains to be done and the pace of improvements likely needs to improve, the facility-intensive departments and agencies have been making substantial efforts within available resources to improve energy efficiency, conservation and independence. The estimated reduction in electricity and heating oil that is at least partly attributable to these efforts is described earlier in this report.

This portion of the report provides a sampling of the kinds of facility projects that have been completed by the various facility-intensive departments and agencies. These efforts, which are partially listed in the following tables, have ranged from the small to large, and from the virtually unnoticed to attention-getting.

The first geothermal heating system in an executive branch facility being installed at the Department of Public Safety's State Police barracks in Skowhegan in 2009.

Examples of perhaps more routine or incremental although still crucial successes include numerous lighting improvement projects, improved energy-saving controls for the industrial heating, ventilation, air conditioning (HVAC) systems used in many facilities, increasing insulation in existing buildings, variable speed drives, demand-controlled ventilation and replacing inefficient windows in certain buildings.

Beyond perhaps more common or routine facility improvements, the departments and agencies also have pursued sometimes more dramatic changes.

Accomplishments in this general category include participation in so-called demand response programs to reduce electricity costs by reducing electricity consumption during peak periods; long-term projects to better track and document actual energy use at the facility level across state government; the use of natural gas or conversion of multiple facilities from heating oil to natural gas; the conversion of a Department of Public Safety State Police Barracks from oil to geothermal heating; the use of B5 blended bio heating fuel in place of No. 2 heating oil; and the pending conversion of a Department of Corrections facility from heating oil to wood.

The pending conversion of a Correctional facility from heating oil to wood energy is a substantial project that will by itself displace approximately 140,000 gallons of heating oil annually or, put another way, will cut the total current heating fuel use of all departments and agencies of the executive branch statewide by approximately 5 percent and will reduce carbon emissions by approximately 1,500 tons annually. That is approximately equivalent to eliminating the carbon produced by driving 3 million miles in a mid-size car.

Wood energy conversion project in progress during late 2009 at the Mountain View Youth Development Center in Charleston. The project ultimately will eliminate 140,000 gallons of heating fuel annually. Start-up is expected in 2010.

The following is a sample listing of additional such projects or accomplishments.

Fuel Oil Reduction

Responsible Department	Project details
DOT	Reduced fuel oil consumption by 10% from FY2008
BGS	Reduced fuel oil consumption by 8% over the past 3 years and reduced electrical consumption by 14% over the same time period
DOT	Programmable Thermostats installed to better control heating and cooling cycles
DOT	Increased insulation at 44 garages
DOT	Burn Used Motor Oil to heat garages
BGS/DOT	Replaced windows with more energy efficient models
DOT	Garage Door Replacements with more energy efficient models
DOT	Door Replacements with more energy efficient models
DVEM	Currently building a new training facility in Bangor that is LEED Silver certified, as will future buildings.
BGS/All	Energy audits for their facilities, generating project lists for energy conservation within those departments.

Electrical Usage Reduction

Responsible Department	Project details
DOT	Lighting fixture Replacements - bulbs, transformers, fixtures
BGS	Lighting fixture Replacements - bulbs, transformers, fixtures
DOC	Lighting fixture Replacements - bulbs, transformers, fixtures
DOC	Occupancy Sensors for offices and conference rooms
BGS	Occupancy Sensors for offices and conference rooms
DOT	Using white paint in the interior walls and ceilings to reduce lighting needs
BGS/All	The State of Maine has contracted and enrolled in demand response programs for both generator and curtailment programs
BGS/All	The State of Maine continues to be the national leader in using renewable energy for all electrical costs at state facilities as we currently have a 100% renewable energy rating through the purchase of renewable energy credits.
DVEM	Currently building a new training facility in Bangor that is LEED Silver certified, as will future buildings.
BGS/All	Energy audits for their facilities, generating project lists for energy conservation within those departments.

Alternative Fuel sources

Responsible Department	Project details
BGS	Currently uses B5 bio-diesel as the majority of its heating fuel source, as 53% of the total consumption of a million gallons is from B5. This increased usage continues to reduce our carbon emissions for capital area facilities.
DOC	Currently uses Natural gas to heat two facilities.
DHHS	Currently uses Natural gas to heat one facility, Dorothea Dix Psychiatric Center
DOC	Currently uses wood to heat the Charleston Correction Facility.
DOC/BGS	Have entered into an agreement with a company to provide heat energy through wood pellets at one of their facilities starting in April of 2010
BGS/DPS	Installed a geothermal heat plant at one of the state police barracks.
DVEM	New Training facility in Bangor will use geothermal heat.

VI. Audit Findings and Recommendations

Considerable attention was paid to the importance and value of energy audits in the Task Force's deliberations.

The Task Force concluded that any investment in energy improvements should have as a component the opportunity for energy auditing. As of the writing of this report, different departments have been able to conduct and implement, to varying degrees and at different times, the recommendations of energy audits within the resources available to each.

A major statewide energy assessment was undertaken in 2004. The two-volume report covered more than 18 million square feet of state space and identified $50 million in projects with estimated payback periods of 20 years or less. While the assumptions and data from that report would need to be revisited and reconfirmed before being pursued at this time, and relatively few of the projects identified at that time had very rapid paybacks in the 0-3 year range, the report nevertheless gives a sense of the scale of improvements that could be identified through energy auditing. A recent review of 10 buildings which are operated by the Bureau of General Services and were included in the original Harriman report determined that five original projects had been completed in four of the 10 buildings, another eight projects with updated payback estimates of fewer than 4 years were prioritized to be done, and two of those eight prioritized projects are funded and moving forward at this time.

In that spirit, the Task Force was able to compile a current sample list of known outstanding energy projects. This is only a partial list of known projects that was derived from sometimes cursory evaluations performed by consultants and the respective Departments. More recent energy audits have not been done on a systematic basis across all facilities and conducting energy audits of any state facilities was well beyond the purview or resources of the Task Force. In total, the sample list includes a set of 70 projects with an average unweighted estimated payback of 6 years and an estimated cost of approximately $4 million.

The Task Force is convinced, based on this sample and on the experiences of its members, that updated energy audits of State facilities, even if accomplished in an ongoing but incremental basis would yield invaluable decision-making data both to identify needed energy projects and to help determine Maine's energy investments would have the greatest benefit.

Below is a sample list of projects, anticipated costs and projected payback time frames, primarily from information provided by the Bureau of General Services and the Department of Defense, Veterans and Emergency Management regarding their respective facilities. At both of these Departments and at other agencies many more projects have been identified but are not provided here because cost and payback information simply is not available. The Department of Transportation, for example, has identified more than a dozen energy conservation, renewable energy and other energy projects totaling an initial

cost estimate of $2 million. Initiatives include better insulating roofs, replacing lighting, conducting energy audits, boiler replacements and other projects.

Project details	Anticipated Costs	Payback Calculation in Years
Conventional LPG Furnace - 80% Efficient Bldg 12 Camp Keyes	$1,890	0.5
Conventional LPG Boiler - 80% Combustion Efficiency Solomon Bldg	$29,814	0.7
Condensing Gas Boiler - 91% Combustion Efficiency Portland	$20,216	0.7
Installation of Energy Smart Power Strips to all computer Workstations	$290,000	0.83
Conventional LPG Boiler - 80% Combustion Efficiency Westbrook	$9,088	1
Conventional LPG Boiler - 80% Combustion Efficiency Lewiston	$15,222	1.2
Electrical Demand Load Shedding at the DOT Building	$6,000	1.2
Electrical Demand Load Shedding at the State Capitol Building	$6,000	1.7
Attic Ceiling: Increase Insulation by R-38 (blow-in cellulose) Bldg 6 Camp Keyes	$21,013	1.8
Conventional Gas Boiler - 84% Combustion Efficiency, Wrap Tank	$7,416	2
Attic Ceiling: Increase Insulation by R-30 Bldg 251	$5,560	2
Install ELECTROLUMINESCENT PANELS for the EXIT signs at Various Armories	$22,212	2
Demand Control Ventilation & Building Pressurization at Cross Office Building	$35,510	2
Combustion Energy Systems at the Human Services Building on 221 State Street	$45,000	2
Combustion Energy Systems at the East Campus Boiler Room	$45,000	2
Demand Control Ventilation & Building Pressurization at Cultural Building	$20,250	2.12
Electrical Demand Load Shedding at the Maine Criminal Justice Academy	$6,000	2.5
Demand Control Ventilation & Building Pressurization at DOT Building	$25,000	2.6
Electrical Demand Load Shedding at the Elkins Building	$6,000	2.6
Electrical Demand Load Shedding at the Human Services Building	$6,000	2.8
Lighting replacement w/ motions at the State Police Headquarters	$12,000	3
Terminal Unit Control Breaker Installations at the Ray Building for Window Air conditioning Units	$10,000	3
HVAC Mechanical & Control Enhancements at BMV Building	$189,570	3.6
Ventilation Control Improvements at Health and Human Services Building	$273,157	3.6
Demand Control Ventilation & Building Pressurization at Health and Human Services Building	$70,000	3.8
Terminal Unit Control Breaker Installations at the Marquardt Building for Window Air conditioning Units	$10,000	4.1
Demand Control Ventilation & Building Pressurization at State Capitol Building	$35,000	4.12
Parking Garage work room Heater Replacement	$17,317	4.2
Lighting replacement w/ motions at the Deering building	$17,848	4.2
Work Room Heater Replacement in the Parking Garage	$17,317	4.2
Lighting replacement w/ motions at the MTA House	$10,400	4.5
Lighting replacement w/ motions at the Nash School	$6,300	4.5
Lighting replacement w/ motions at the Smith-Merrill House	$7,600	4.5
HVAC Controls Improvements at the Human Services Building on 221 State Street	$83,014	4.5
Energy Recovery Ventilation with Demand Control Ventilation at MCJA	$120,000	4.82
Roof build up and Attic Ceiling: Increase Insulation by R-30 (blow-in cellulose) at Various Armories	$202,886	5.9

Install Thermal Break Aluminum Frame Double Pane Argon/Low-e Window Bangor Building 251	$1,212	6.4
Lighting replacement w/ motions at Building 17	$1,000	6.5
Lighting replacement w/ motions at Augusta District Court	$13,000	6.5
Lighting replacement w/ motions at the State Crime Lab	$18,000	7
Lighting replacement w/ motions at the Tyson building	$17,000	7
Free Cooling for CSOB	$307,000	7.9
Lighting replacement w/ motions at the Cultural building	$58,000	8
Lighting replacement w/ motions at the McLean House	$4,000	8
Lighting Control at BMV	$56,500	8.1
Lighting replacement w/ motions at the Daschlager House	$5,400	8.5
Lighting replacement w/ motions in the Elkins Building	$9,000	9
Install Thermal Break Aluminum Frame Double Pane Argon/Low-e Window Houlton Armory	$14,573	9.4
Energy Recovery Ventilation at 221 State Street	$400,000	9.9
Lighting replacement w/ motions at the East Campus Boiler room	$5,000	10
Energy Recovery Ventilation with Demand Control Ventilation Control at Deering Bldg	$120,000	10
Install Thermal Break Aluminum Frame Double Pane Argon/Low-e Window Gardiner Armory	$29,051	10.1
Air Conditioning Upgrade at 242 State Street	$250,000	10.2
Lighting replacement w/ motions in the Engineering Building	$9,200	10.5
Lighting replacement w/ motions at the Lottery Building	$70,000	10.5
Install Thermal Break Aluminum Frame Double Pane Argon/Low-e Window Calais Armory	$16,350	10.6
Install Thermal Break Aluminum Frame Double Pane Argon/Low-e Window FMS1 Portland	$19,034	10.8
Lighting Bulbs and Fixtures Update in Marquardt	$16,930	11
Air Conditioning Upgrade at 221 State Street	$250,000	11.6
Lighting Bulbs and Fixtures Update I Elkins	$9,020	11.9
Lighting replacement w/ motions at the AMHI tunnels	$30,000	12
Install Thermal Break Aluminum Frame Double Pane Argon/Low-e Window Portland Armory	$19,386	12
Lighting replacement w/ motions for AMHI tunnels	$113,140	12
Insulate built-up roof surface on underside where accessible at the Portland Armory	$83,787	12.4
Energy Recovery Ventilation at Marquardt	$200,000	12.5
Energy Recovery Ventilation for Tyson Building	$135,000	13.5
Free Cooling for BMV building	$150,000	13.5
Total	$4,136,183	6.0909

VII. Fiscal Options: Opportunities, Benefits and Costs

While the Task Force was directed in its statutory charge to avoid or minimize to the extent possible any request for new resources, either people or money, these investments do deliver both real economic and energy benefits, and there are times when resources simply will be required if the energy advances that are identified in this report and which generally are desired by policymakers as evidenced by the creation and charge to the task force.

State Economist Michael LeVert estimates that investments in energy efficiency will have a positive impact on the Maine economy through job creation both directly and indirectly, increase earnings and Maine's GDP. For every $1 million spent, an estimated 25 new jobs would be created.

The departments and agencies involved in this effort already are making real and meaningful efforts to avoid unrealistic resource requests and are seeking, with Legislative support, new and innovative ways to make progress without the need for short-term fiscal resources.

As an example, the substantial fuel conversion project described in this report that will displace an estimated 140,000 gallons of heating oil consumption is being undertaken using new authority approved by the Legislature. This major improvement is not requiring any up front investment by the state, will provide a fiscal savings over the term of the contract, and will deliver significant energy benefits without an adverse budget impact.

The Task Force understands the fiscal circumstances confronting our nation and state. The statutory charge specifically urged that we avoid resource requests to the extent possible. No new positions or new headcounts are being requested. This report, as well as the departments and agencies participating in its development, take seriously the goal of being realistic about the resources that will likely be available for improving the energy situation of state facilities.

That said, there are many projects that, upon implementation, have payback periods of less than one-year. Which means that implementation of some projects will result in savings that are achieved within a single budget cycle. The Task Force believes that the accurate identification of such projects through energy auditing and the immediate funding of implementation is not only consistent with the charge of this group but is a form of fiscal responsibility that Maine people expect from their Government.

In these situations and many others, there are times when investments and resources simply will be necessary if progress is going to be made.

The Task Force discussed a number of options for creating a mechanism to make investment resources available for energy projects at these facilities. Private energy savings company agreements, general obligation bonding, grant funding, the creation of an internal state-operated ESCO and other ideas were discussed.

Ultimately, the Task Force, as summarized in the next section of this report, is recommending that capacity within the existing cap of the Maine Governmental Facilities Authority and available to the Bureau of General Services be re-authorized in an amount of up to $4 million beginning in the FY12-13 biennium and be specifically directed to energy projects. It is the recommendation of this report that the funds be administered by the Bureau, as is the case today, and in close cooperation with the departments and agencies of state government to help ensure the highest value projects are identified and pursued. These decisions will be made using the best information available, and will typically only be made after energy audits and associated payback assessments have been performed.

Use of the State's existing authority at the earliest time possible will ensure that the State makes resources available to investments that will immediately pay dividends in the form of energy cost savings.

In the future, additional tools or mechanisms may become necessary or desirable. The Task Force, for example, absolutely recognizes its efforts are being undertaken alongside other related efforts. The Maine Technical Building Codes and Standards Board is working toward the adoption of a statewide building energy code, for example. Also, the Maine Public Utilities Commission in consultation with a stakeholders group will soon recommend to the Joint Standing Committee on Utilities and Energy pursuant to 2009 Resolve, Chapter 134, the steps to be taken to promote the use of the standardized rating system and reporting form for building energy consumption in Maine, including at state-owned facilities.

At this time, given its statutory charge and constraints, the Task Force suggests the fiscal recommendation in section VIII as a next and meaningful step.

VIII. Summary and proposals

Below is a list of recommendations this task force has developed in addition to the list of projects both short term and long term that we wish to pursue.

1. **Report annually on energy consumption:** The Bureau of General Services should report annually with cooperation from and in consultation with the other Departments of State Government regarding energy use at the facilities of Executive Branch Departments and Agencies. The report should be submitted to the Governor and the Joint Standing Committee having jurisdiction on state and local government matters. Such a report, for the purpose of consolidating all facility-related energy expenditures by executive branch Departments and agencies, at a minimum, should report on the following:
   A. total energy consumption and building energy rating at the relevant facilities for the reporting period,
   B. selected successes, projects, or changes affecting consumption by State government and,
   C. identified outstanding energy projects.
   This report would enhance the accuracy and availability of pertinent energy information for decision-makers. Such a consolidation of information also would increase the pragmatic opportunities to measure, plan and reduce energy costs and consumption. The Bureau of General Services has indicated it is prepared to undertake this report if there is interest and support from policymakers.

2. **Coordinate energy activities to promote conservation:** Continue and expand cooperation between energy-consuming Departments and Agencies regarding energy usage, building audits, conservation ideas, and cost by conducting regular meetings of appropriate staff from those energy-intensive Departments, including but not limited to DAFS, DOC, DVEM and MDOT. The agencies should establish a work group to continue the coordination and expand the membership to other departments and outside agencies. Increase educational opportunities regarding new technologies by the work group. The Bureau of General Services has indicated a willingness to lead this effort and many current members of the task force, with the caveat that additional members may be invited, have indicated an interest and willingness to participate.

3. **Fund Energy Infrastructure Investments Using Existing Authority:** Create a fiscal mechanism specifically to fund energy conservation, efficiency, independence and security projects at the facilities of the Executive branch Departments and Agencies of state government. It is the recommendation of this report that Maine direct specifically to energy projects an amount of $3-$5 million in Maine Governmental Facilities Authority funding from the existing capacity which already could be available with Legislative approval to the Bureau of General Services for investments in state facilities generally beginning in the FY12-13 biennial budget cycle. Absent a specific Legislative prohibition, the Bureau of General Services would make this request to the Governor for subsequent Legislative consideration as part of the normal biennial budget process for FY12-13.

IX. Appendices

A. Bureau of General Services presentation to the task force
B. Department of Corrections presentation to the task force
C. Defense, Veterans and Emergency Management presentation to the task force
D. Department of Transportations presentation to the task force
E. LPB Energy Management presentation to the task force
F. Statutory charge excerpt
G. State Energy Office Plan excerpts, and information pursuant to 2007 Resolve, Chapter 183, Section 5

Appendix A

Property Management Division, Task Force Presentation
September 2009

General Overview:

Property Management provides service to 72 buildings with-in the communities of Augusta, Hallowell and Vassalboro. Property Management tracks energy consumption for 49 of the 72 buildings. Consumption is tracked but not reported for 19 buildings on the Hallowell Complex (slated to be sold), 2 outlying buildings which presently do not have data available (leased or not under PMD direct control), and 3 that are unheated.

In 2009 PMD buildings consumed energy as follows;

Fuels for heating;

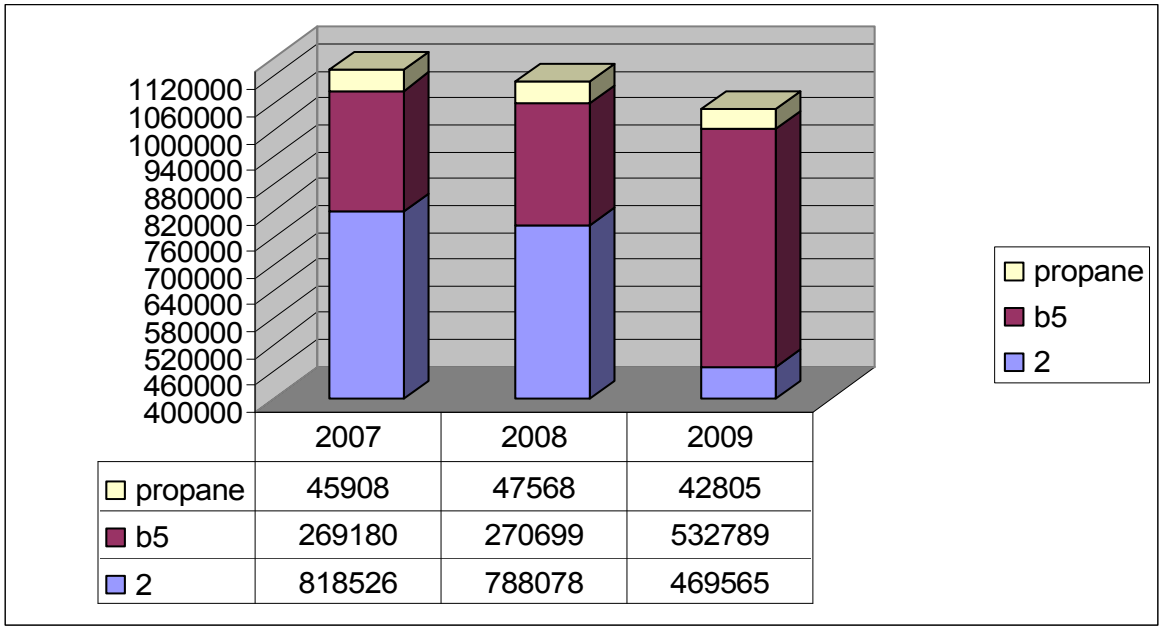
- #2 - 469,565 gallons
- B5 - 532,789 gallons
- Propane - 42,805 gallons

Electrical Load total for PMD buildings;

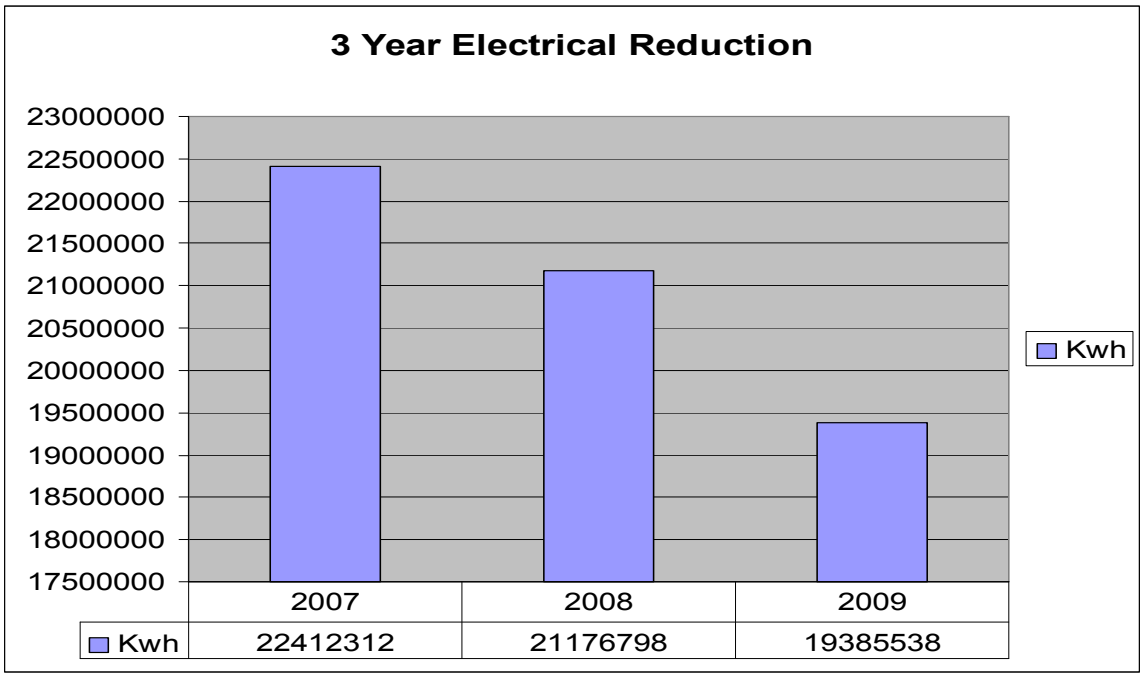
- 19,385,538 kwh

Property Management is enrolled in a Demand Response program thru a company called EnerNOC. This program will pay a fee to Property Management to ensure we can remove a given amount of power from the grid by running the Burton Cross Office Building generator.

Property Management Division has in the last 3 years reduced fuel consumption by 8 percent and electrical consumption by 14 percent.



	2007	2008	2009
propane	45908	47568	42805
b5	269180	270699	532789
2	818526	788078	469565



Savings are attributed to the following changes;

- Closing of non efficient buildings
- Reducing run time of HVAC units
- Less run time on chiller systems

Property Management Division is working with the following companies with the goal of finding ways to reduce energy consumption.

- Harriman Associates
- Honeywell Inc.
- LPB Energy Management
- The Blake Group
- Graybar

Some of the proposals to date are as follows;

- Lighting upgrades
- Air cooling units for chilled water
- Dedicated A/C Unit for Building Control
- Window replacement
- Geo thermal
- Demand Control Ventilation
- HVAC upgrades
- CoGen project for East Campus
- Air Conditioning - Terminal Unit Control Breaker Installation

- Building Pressurization
- Control Upgrade
- Electrical Demand Load Shedding
- Energy Recovery Ventilation with Demand Control Ventilation Control
- Yearly Steam Trap Maintenance
- Building Audits

Property Management Division is developing a working database to ensure accurate and up to date building information is maintained and accessible. It should be noted that LPB Energy Management is the primary data gathering resource for Property Management Division. Property Management is creating a deeper driven database that will track the following information by building versus campus.

- Various Fuel types
- Consumption amounts
- Kwh
- CO2
- MBTUs
- Energy Projects
- Energy Measures
- Building Profiles

Part of the database will include building profiles. To date we have completed 4 building profiles and expect to have all building profiles completed prior to December 1, 2009. Once the process of creating the building profiles has been completed this information will be used to determine where it is best to spend dollars on energy projects that will benefit the State of Maine by reducing energy consumption. The next several pages are a draft profile of the BMV Building and are a sample for presentation:

Pages are as follows:

- Main page giving a general overview of the building being profiled
- Energy Utilization index
- Facility Consumption
- Projects and Measures page
- Benchmarking Non-Electric
- Benchmarking Electrical

BMV Building

This building is a good example of post modern design with a few playful twists. Off-axis plan and a colorful mix of construction materials lend a lot of visual interest to a rather simple masonry box. The structure is tucked into the south side of a sloped site, which is landscaped to provide a handsome forecourt for employee use and a strone stated entrance for the public.

Building Code :	BNL	Space Usage :	Office		
State Owned :	Yes	Circa :	1992	Survey Date :	7/17/2009
Square Footage :	78,400	Height :	57'	# of Occupants :	300
Basement :	No	# of Stories :	3.5	Exposure :	Sunny

Roofing
Material: Adhered member, mtl
Pitch: Shallow
Condition: Good

Exterior Doors
Material: Aluminum
Glass Glass
Condition: Good

Extetrior Wall
Material: PC conc, EOFS, Brk vene
Insulation: FG batt
Thickness: 6"
Condition: Good

Windows
Type: Awning, fixed
Material: Aluminum
Glass: Insul
Condition: Poor

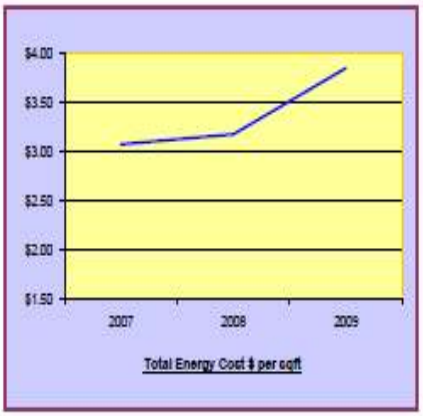
Electrical
Service: Public
Power Feed: Underground
Supply: 480v 3p
Area Lightening: Yes
Lighting Motion: No
Exterior Lightening: Yes
Generator: Yes
Generator Capacity:
Condition: Good
Breaker Capacity: 2500
Metering: Yes

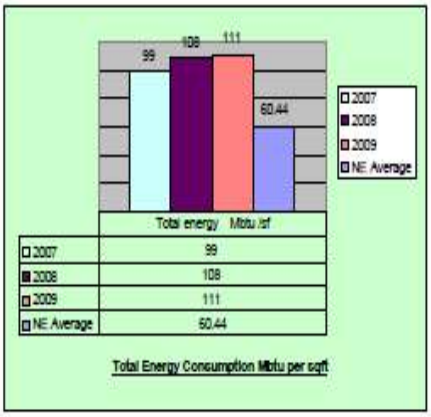
HVAC System
Fuel: #2
System Type: Hot Water
Cooling System: VAV
System Type: Chiller system
Condition: Good
System Controls: Yes, BCC
System Monitoring: Yes - Intelligent
Metering: No

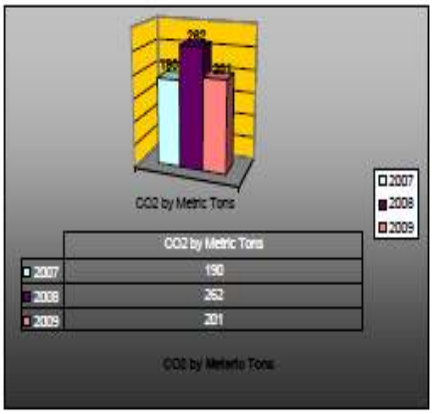
BMV Building

Summary

Floor Area s/f	Year	KW Usage	Green Credits Purchased	Elec $ per kw	Total Electrical $	Gallons Heating #2	Heating #2 $ per Gallon	Gallons Heating B5	Heating B5 $ per Gallon	Gallons Propane	Propane $ per Gallon	Total Heating $	Elec $ / sf	Heating $ / sf	Total energy $ /sf	Total energy Mbtu /sf	CO2 by Metric Tons
78,400	2007	1,519,674	1,519,674	0.13	$197,557.62	18692	$2.34	0	$0.00	0	$1.51	$43,739.28	$2.52	$0.56	$3.08	99	190
	2008	1,439,991	1,439,991	0.12	$172,798.92	25802	$2.96	0	$0.00	0	$1.81	$76,373.92	$2.20	$0.97	$3.18	108	262
	2009	1,752,400	1,752,400	0.13	$227,812.00	19810	$3.74	0	$0.00	0	$1.56	$74,069.40	$2.91	$0.95	$3.86	111	201
															NE Average	60.44	



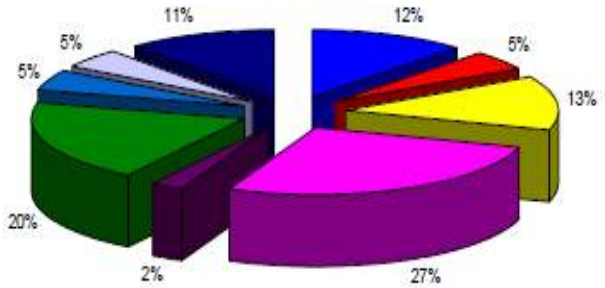




*** North east average figured by Honeywell using figures supplied by Oak Ridge National Laboratory

*** Green credits purchased in 2007, 2008, 2009

BMV Building



Cooling Cooling Computer Room Computer Room Heating Pumps Lighting Fans Domestic Hot Water Plug Load (Include Computers)

Total Facility Consumption	8,593 (Millions of BTU/hr)
Cooling	12.2%
Cooling Computer Room	4.6%
Computer Room	13.2%
Heating	27.4%
Pumps	2.5%
Lighting	19.8%
Fans	5.1%
Domestic Hot Water	4.8%
Plug Load (Include Computers)	11.5%
Kitchen	0.2%
Total	100.0%

Benchmarking Non-Electric Energy Use in U.S. Office Buildings

Revision: Oct. 2001

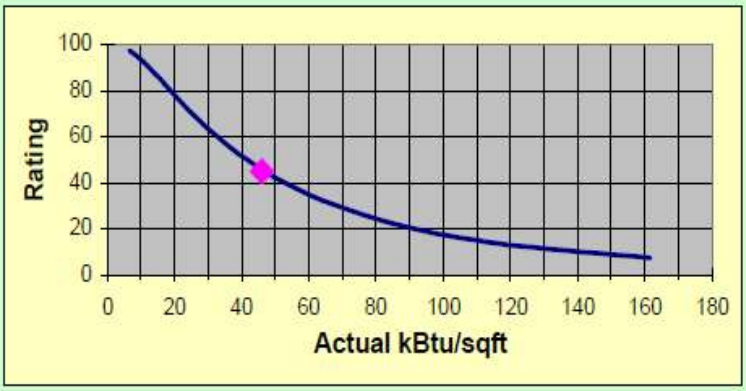
Describe your office building in the purple cells to determine:

1. Your office building non-electric energy use index (EUI) in kBtu per sq. ft.
2. The typical (median) EUI for office buildings with similar characteristics
3. An energy performance rating for your building (your rank among peers). High rating=superior performance. Low rating=large improvement potential.

Building identifier	BMV	
Building location (Census Division)	1	(page down for options)

Building gross floor area (sq ft)	Annual non-electric energy use (therms or CCF)	Is the building heated by electricity (Y/N)	Number of workers in building
78400	36112	n	300

Is natl gas supplied to building (Y/N)	Is steam or hot water piped in to building (Y/N)
y	not used
not used	



Non-electric use per sq. ft. (kBtu/sf)	
Your building	Typical building
46.1	39.1

RATING	45
(% of office buildings less efficient)	

Number of buildings used in analysis for this Census Division:	71

CENSUS DIVISIONS

Census Division	Region	States
1	NEast	ME, NH, VT, MA, RI, CT
2	NEast	NY, PA, NJ
3	Midwest	MI, OH, IN, IL, WI
4	Midwest	MN, IA, MO, ND, SD, NE, KS
5	SEast	DE, MD, DC, WV, VA, NC, SC, GA, FL
6	SEast	KY, TN, MS, AL
7	South	AR, LA, OK, TX
8	West	MT, WY, CO, NM, ID, UT, AZ, NV
9	West	WA, OR, CA, AK, HI

Developed by the Buildings Technology Center at Oak Ridge National Laboratory
http://www.ornl.gov/ORNL/BTC/
For additional background see:
http://eber.ed.ornl.gov/benchmark/

Please direct questions and comments to:
Terry Sharp
Oak Ridge National Laboratory
PO Box 2008, Bldg 3147
Oak Ridge, TN 37831-6070
Telephone: (865) 574-3559
Email: sharptr@ornl.gov

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Benchmarking Electric Energy Use in U.S. Office Buildings

Revision: June 2000

Describe your building in the purple cells below to determine:

1. Your office building electricity use index (EUI) in kWh per sq. ft.
2. The typical (median) EUI for office buildings with similar characteristics.
3. An energy performance rating for your office building (your rank among peers). High ratings=superior performance. Low ratings=large improvement potential.

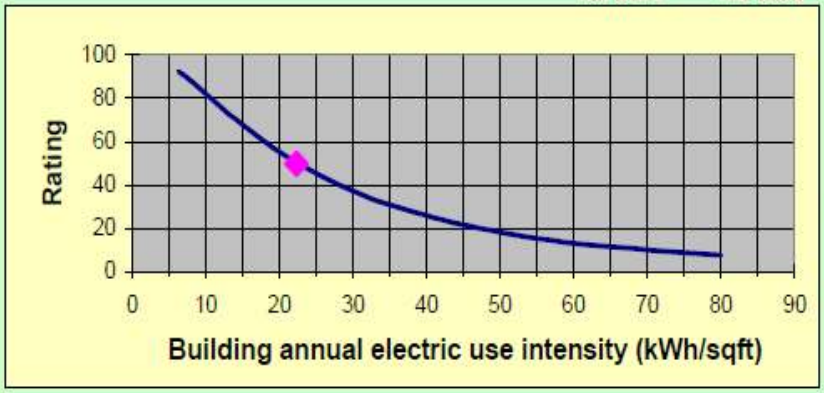
Building identifier	BMV

CENSUS DIVISION	1	(page down for options)

BUILDING RATING	50
(% of office buildings less efficient)	

Building gross floor area (sq ft)	Annual electricity use (kWh)	Number of workers in building	Number of PCs in building	Owner-occupied (Y / N)	Weekly operating hours (hours)
78400	1752400	300	300	y	50
				not used	not used

Your building rating is from the curve at your electric use intensity. "Typical" building electricity use intensity is from the curve at a rating of 50%.



Electric use intensity (kWh/sq. ft.)	
Your building	Typical building
22.4	21.3

Number of buildings used in analysis for this Census Division:	76

Developed by the Buildings Technology Center at Oak Ridge National Laboratory
http://www.ornl.gov/ORNL/BTC/
For additional benchmarking information see: http://eber.ed.ornl.gov/benchmark

CENSUS DIVISIONS

Census Division	Area	States
1	NEast	ME, NH, VT, MA, RI, CT
2	NEast	NY, PA, NJ
3	Midwest	MI, OH, IN, IL, WI
4	Midwest	MN, IA, MO, ND, SD, NE, KS
5	SEast	DE, MD, DC, WV, VA, NC, SC, GA, FL
6	SEast	KY, TN, MS, AL
7	South	AR, LA, OK, TX
8	West	MT, WY, CO, NM, ID, UT, AZ, NV
9	West	WA, OR, CA, AK, HI

Please direct questions and comments to:
Terry Sharp
Oak Ridge National Laboratory
email: sharptr@ornl.gov
telephone: (423) 574-3559
fax: (423) 574-9338

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Appendix B

DEPARTMENT OF CORRECTIONS – PHYSICAL PLANT DATA

The DOC is made up of seven (7) major facilities compromising roughly 1,501,000 square feet. The facilities are:

Maine Correctional Center – Windham
Long Creek Youth Development Center – South Portland
Maine State Prison – Warren
Bolduc Correctional Facility – Warren
Charleston Correctional Facility – Charleston
Mountain View Youth Development Center – Charleston
Downeast Correctional Facility – Bucks Harbor

In addition to the major facilities – we have a pre-release operation in Hallowell, and lease space on the Dorothea Dix campus for our Women's Re-entry Center.

We also have community operations in leased offices throughout the state that comprise about 70,000 square feet.

DEPARTMENT OF CORRECTIONS – ENERGY INFORMATION

- 2 facilities heated with natural gas.
- 4 heated with #2 fuel oil.
- 1 heated with wood.

During the last legislative session, due to the budget situation, we took a hard look at how our facilities operated and asked staff for suggestions on how we could save money by making changes/adjustments that were energy related.

Below is a summary of some of the changes that were adopted by the department to save money and energy.

- Maine Correctional Center - Windham
  - Installed pressure regulators, faucet and sprayer restrictors in kitchens.
  - Replaced flushometers on inmate toilets – converting flushometers from 5 gallon to 3.5 gallon.
  - Converted the fuel source in the maintenance building from #2 to natural gas.
  - Converted the fuel source in the kitchen from propane to natural gas.
  - Adjusted steam pressure loads down and reduced steam flow to certain buildings during off season use.
  - Reduced facility perimeter lighting around the women's center by removing every other light.
  - Installed occupancy sensors in areas such as briefing rooms, locker rooms, etc.

- Downeast Correctional Facility - Machiasport
  - Changed the fuel source from a blend of #2 and kerosene to straight #2, which is cheaper than the blended. We were able to do that by insulating all the exterior fuel tanks and relocating the fuel filters from the outside of buildings to the inside.
  - Installed new light fixtures in inmate rooms that use lower watt, energy efficient bulbs

- Charleston Correctional Facility - Charleston
  - Increased wood burning operations from 1 shift to all 3 shifts making that facility almost oil independent. Anticipate burning between 800 and 1,000 cord this year.

- Long Creek Youth Development Center – South Portland
  - Installed occupancy sensors in various rooms of the facility

- Mountain View Youth Development Center – Charleston
  - Installed occupancy sensors in various rooms of the facility
  - Re-wired bathroom fans so that fans only come on when lights are turned on
  - Reduced interior facility lighting after doing an analysis on requirements and use
  - Installed energy star bulbs in kitchen and cooking areas

- Maine State Prison – Warren
  - Re-lamped the perimeter light poles – replacing 1,000 watt lamps with 400 watt lamps
  - Reprogrammed the recreational area lighting
  - Installed occupancy sensors in various rooms of the facility
  - Modified and fine tuned lighting program throughout entire facility
  - Reprogrammed the timers on the night lights in each cell

LOOKING FORWARD

Looking forward, the department has the following energy initiatives underway:

- Partnered with BGS for the installation of an external wood pellet boiler at the Mountain View facility in Charleston. Once installed, this facility will also be independent of #2 fuel oil.

- Partnered with BGS and have enrolled all of our facilities in a demand response program with a company called EnerNOC. The program provides revenue to the department for being enrolled in the program and also provides revenue when the department uses its generators in the event that a demanded response event is declared by ISO New England. The revenue will be used to offset utility costs.

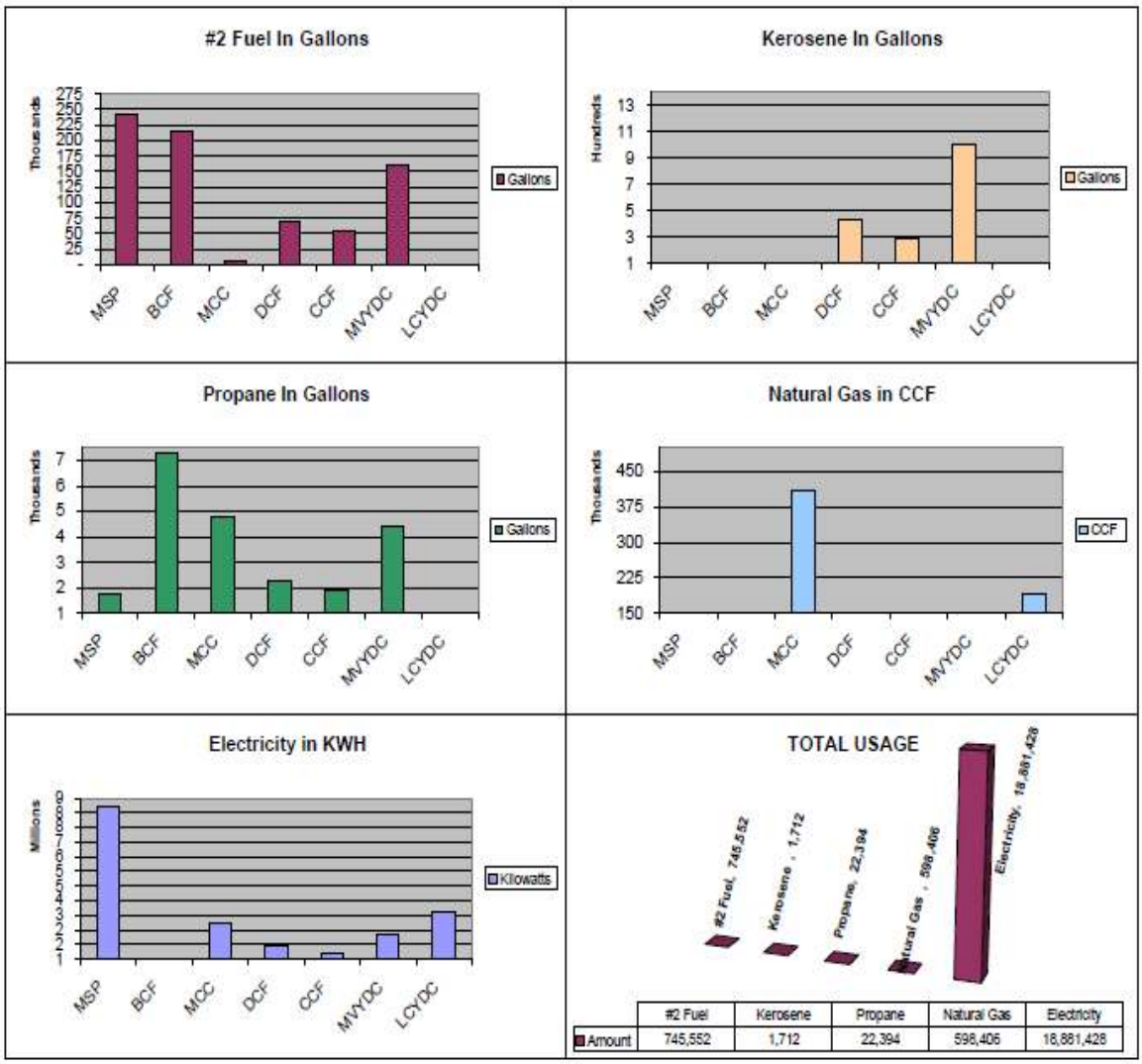
- Study currently underway to examine wind patterns at the Charleston facility – for the potential installation of a wind turbine

- Monitoring water usage in the laundry at the Maine State Prison – looking at the possibility of installing an Ozone Washing System

- We're also looking at solar alternatives for hot water heating at our facilities

- Energy related projects the department is seeking MGFA funding for:
    - Window replacements at the Maine Correctional Center
    - Boiler and boiler control replacements at the Maine Correctional Center
    - Food service air handling unit/system at the Maine State Prison
    - HVAC system upgrade for dry food storage area at the Maine State Prison
    - HVAC system upgrades in the laundry, kitchen and gymnasium areas at the Long Creek Youth Development Center.

DEPARTMENT OF CORRECTIONS ENERGY USE FY09



	#2 Fuel	Kerosene	Propane	Natural Gas	Electricity
Amount	745,552	1,712	22,394	598,406	18,881,428

C:\Documents and Settings\mitchell.boynton\Desktop\INFORMATION FOR ENERGY TASK FORCE PRESENTATION GRAPH 9-16-09.xls

Appendix C

Department of Defense, Veterans and Emergency Management

Report to

The Task Force to Advance Energy Efficiency, Conservation and Independence at State Facilities

Opportunity to Improve

17 September 2009

General Overview:

Military Bureau facilities inventory includes approximately 300 facilities at various locations from Fort Kent to Sanford, including 17 Armories, 6 maintenance shops, seven Army National Guard (ARNG) training sites, and the multi-facility Air National Guard Base at Bangor International Airport.

Maine's Emergency Management Agency is located in rental space in the Central Maine Commerce Center. Bureau of Veterans Services maintains offices in Military Bureau Facilities but has more than $200,000 in energy related expenses associated with the Veterans Cemeteries.

The Military Bureau receives annual funding over $5 million from the Federal Government for construction, maintenance and operational support of federally supported Military Bureau (Army) facilities. Army National Guard 010 appropriations (not including personnel services) for 2010 total $951,138, inadequate to maintain current operations let alone invest significantly in energy improvements. Approximately $325,000 in 010 funds goes to support about 720,000 square feet of space (about 2/3 supported with Federal dollars). At less than $1.25 per square foot, this level of support is obscenely low making true forward progress almost impossible. Other, limited State revenue sources have included proceeds from sale of armories, armory rentals and some BGS Bond support for roof replacement and Life/Safety projects.

The Military Bureau manages facilities under a Federal/State Cooperative Agreement with overall funding being about two thirds Federal. Each facility has an established percentage of Federal support. Unfortunately, a lack of State money often forces the ARNG to do projects of lower priority only because they are 100% federally supported.

We operate under numerous Federal guidelines affecting energy including National Guard regulations on Facilities Management, numerous Army regulations, the Energy Policy Act of 2005, and Executive Order 13423.

Energy Environment:

Within DVEM, the Military Bureau owns most of the facilities and has by far the largest energy cost. While the ARNG continues to make energy improvements, there is a $1.2 million backlog of documented, unfunded energy improvements. (See App 1). In early 2009, we contracted with Buck Consulting Group of Camden to do energy evaluations of most of our facilities, resulting in the $1.2 million of documented improvements with computations of cost and payback analysis completed.

Several high dollar energy improvements have been made during the past two years including new roofs upgraded to R-30 at Calais, Gardiner, and Sanford armories; and, new dual boilers at Building #8 and Building #39 at Camp Keyes. Contracts for new heating systems have been let for building #14/35 and #37 at Camp Keyes. Significant lighting systems improvements including LED exit signs, T-8s and occupancy sensors have been made at the Waterville, Westbrook, Sanford, and Brewer armories. The Air National Guard completed a major lighting improvement at the Base in Bangor working with Efficiency Maine (See App 2).

In May 2009, the Maine Army National Guard received $1,105,000 for eleven projects approved under the **American Recovery and Reinvestment Act** (ARRA). Included in the project list (See App3) are several projects with energy impacts including replacing overhead doors in maintenance shops, windows, a data center HVAC system, and three heating system replacements. Nine of eleven projects are already under contract.

The Maine Army National Guard has under construction a 42,000 square foot **Regional Training Institute** in Bangor replacing several 1940s vintage buildings at Camp Keyes. This is Phase I of a two-phase project. This new facility, being built entirely with Federal funding, is shown below in an architect's rendering.

Designed to the LEED Silver standard, the initial A&E heating design recommendation was to use propane. We forced a design relook and were able to justify a switch to a **geo-thermal heating system** that will save energy for decades to come.

Future Congressionally approved Military Construction projects must meet LEED Silver standards. To that end, two of our engineers have attended LEED training but are not yet certified. The Bureau of Veterans Services has trained an individual at the Building Operators Course which is paying dividends in more efficient management of the Augusta facility.
Phase II of the new RTI in Bangor is at 35% design. Recent discussions with Bangor Gas Company indicate the possibility of extending their natural gas distribution line as one option to heat and cool this new facility to be built in the next several years.

Federal Mandates & Reporting:

Executive Order 13423 mandates specific energy reductions year over year thru 2015 with 2003 data as a baseline. (See APP 4) In order to comply with mandates, the ARNG utilizes utility tracking software called **Utility Manager Pro**. Every utility invoice is input into this software in addition to the expense information entered into the State's Advantage accounting system. From this software comes summary data which is then fed quarterly to the Army's Army and Water Reporting System AWERS software. AWERS feeds mandated Congressional reporting. (See APP 5)

The UmPro software provides excellent reporting capability out the back side. (See APP 6) Reports of various types are frequently used internally in budgeting and project management. The drawback is that all utility data is being key entered into both this software and into the State's Advantage accounting system.

Federally supported facilities that cost more than $35,000 annually on a utility must be "smart metered" by 2011. We have six facilities that qualify. Any maintenance project totaling over $200,000 that touches a utility is to include smart metering of the utility in the project.

We are unlikely to meet Federal electrical energy reduction targets established by EO 13423 because as we upgrade, most of our facilities must have HVAC ventilation installed to meet building codes for air exchange and quality. This new HVAC comes at significant electrical expense that did not exist previously.

Initiatives

Many initiatives are on going. The Commissioner, MG John W. Libby has published an **Energy Policy** (See App7) to set an organizational tone. After significant study last year, a **Compressed Work Schedule** for Federal employees was put into effect where every other Monday most of our facilities are closed in order to save energy

Several lighting projects have been undertaken and rebates sought from Efficiency Maine. As buildings are renovated, our newly acquired expertise is paying dividends as we spec more efficient systems.

Bureau of Veterans Services will construct a new Veterans Cemetery in Springvale with the help of the Federal Veterans Administration. The construction project, 100% federally funded, will be "Green" as it affects future operating costs appropriated by the State.

A contract is underway in the ARNG to look at building control systems in place, and to recommend one standard going forward.

We may consider further extension of natural gas to the Armed Forces Reserve Center as part of a systemic revamp of the heating system and the addition of cooling capacity. Presently, the

building utilizes window air conditioners. See the photo below, indicative of air conditioning in many of our facilities:

Appendix D

MaineDOT Energy Efficiency Measures Presentation to the
Task Force to Advance Energy Efficiency, Conservation
and Independence at State Facilities

September 16, 2009

MaineDOT has undertaken many measures to conserve energy. This paper presents what conservation steps the Department has accomplished to date and what resources were used in FY 2009 to run our facilities. It should be noted, that the Child Street Headquarters building is included in the Bureau of General Services report.

Use in FY 2009

- Heating Fuel: 318,000 gallons used of #2 heating oil and diesel combined. At many garage locations diesel is used which is allowable since the State of Maine does not pay taxes on road fuel. This is a 10% reduction from FY 2008 usage even though the heating degree days increased 5%.

- Electrical: $1,067,000 was paid for electricity at facilities which is estimated to be 12,533 MW. We track the cost of electricity at this time as the measure of use. Rates vary so a combined rate was estimated to be $0.085 per kwh.

- Propane: $135,000 – a very small amount for a rest area and a couple of garages

- B5: At this time biodiesel is not used. Diesel and biodiesel bids were requested and only diesel was bid by the vendors. When this contract expires, we will again attempt to contract for and use biodiesel.

- Kerosene: None used

- Natural Gas: None used

Energy Efficiency Measures

1. Added blown-in insulation to 44 garage attics.

2. Installed programmable thermostats so that heat can automatically be turned down on nights and weekends when crews are not in the building.

3. Continuously replacing overhead garage doors, entry doors and windows for security and energy efficiency.

4. Most overhead garage doors are equipped with automatic openers/closers which minimizes the time the door is open letting heat escape.

5. We are building to LEED standards.

6. Replacing roofing and insulation on a region office building.

7. Updating light fixtures to increase efficiency.

8. Garage walls and ceilings are being painted white making them brighter which reduces the amount of light required.

9. Retrofitting old garages by installing internal walls around the bay where the mechanic works and crew areas which permits lower settings in the equipment storage part of garages.

Additional Measures

1. Diesel is locked in for FY 2010 at $ 2.175 per gallon which will stabilize the fuel costs for the fleet as well as for facilities.

2. MaineDOT will continue to accomplish more of the above conservation measures.

3. We will pursue alternative fuels such as wood boilers, wood chip boilers, and solar for electricity.

Appendix E

EPB Energy Management
Report, reduce, repeat.

State of Maine Energy Efficiency Task Force

September 16, 2009

LPB Overview

- LPB is assisting the State of Maine with Competitive Supply Solutions for state agencies
  - Assist with procurement of electricity and fossil fuels for savings opportunities
  - Provide Utility Data Management Services for procured commodity accounts through our Utility Manager Software tool.

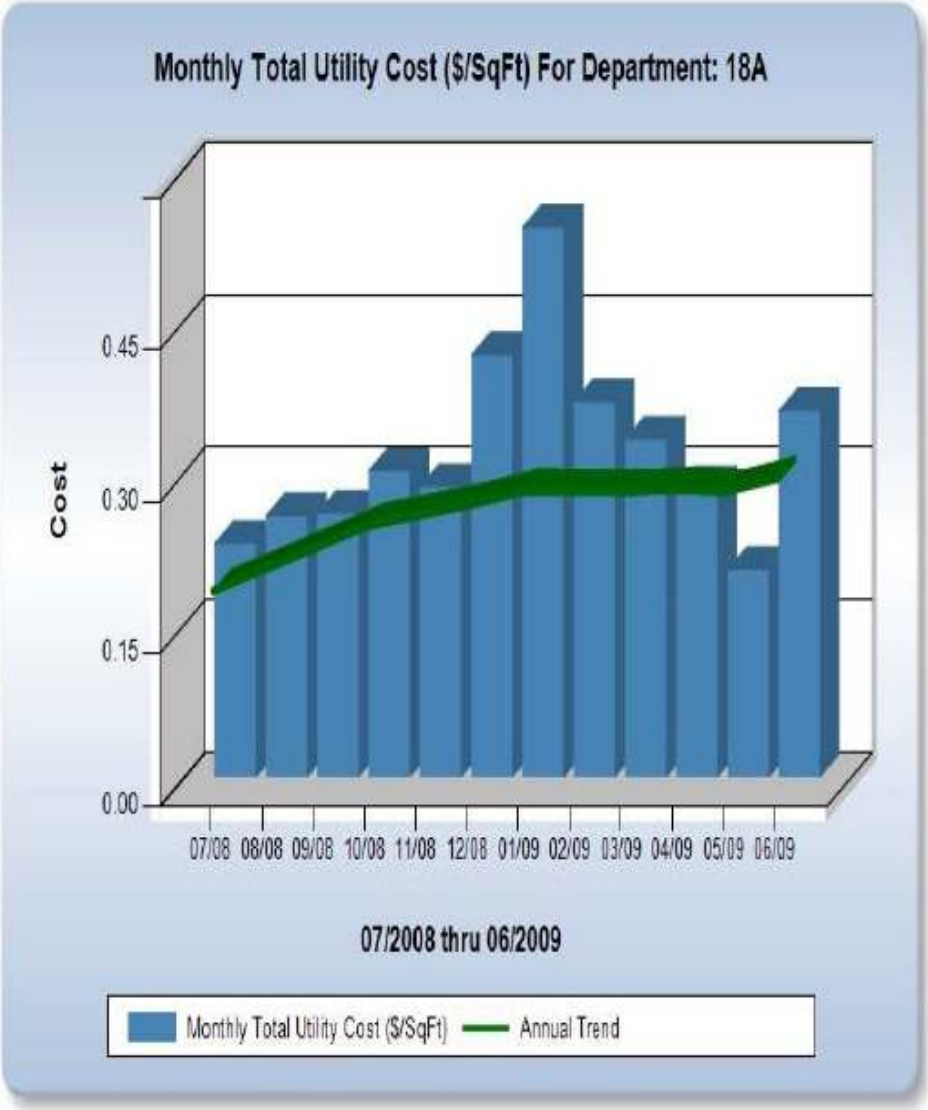
Reporting

- Once data is collected in the Utility Manager database, agencies can use the software to review energy usage and costs through Utility Manager Online's reporting functions.
- Utility Manager Online can produce hundreds of reports to help agencies understand the energy consumption of their facilities.
- This data supports identification and prioritization of energy savings opportunities and initiatives.

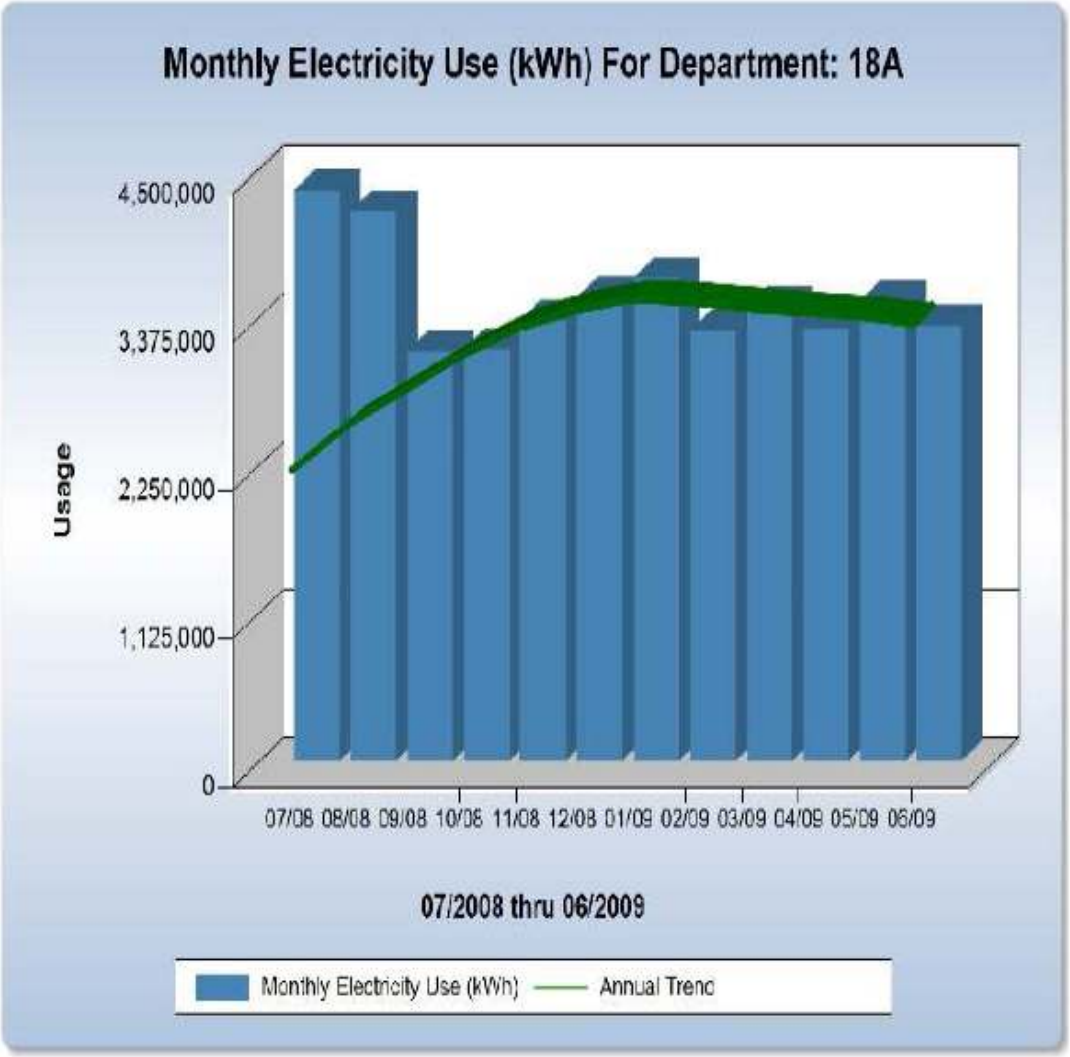
Reporting

- Reports in Utility Manager offer the following extremely useful data:
  - Utility usage and cost
  - Cost variances and facility benchmarking summaries
  - Reports on energy, fossil fuels, combined utility usage and costs, and carbon emissions
  - Ability to track and benchmark electricity, fossil fuels, water, sewer, refuse and recycling costs and savings
  - Unlimited grouping functionality to facilitate like-site comparisons, benchmarking, and identification of site-level opportunities
  - Establishment of baselines for use in evaluating performance contracts or calculating ROI for energy savings investments or initiatives

Monthly Utility Cost

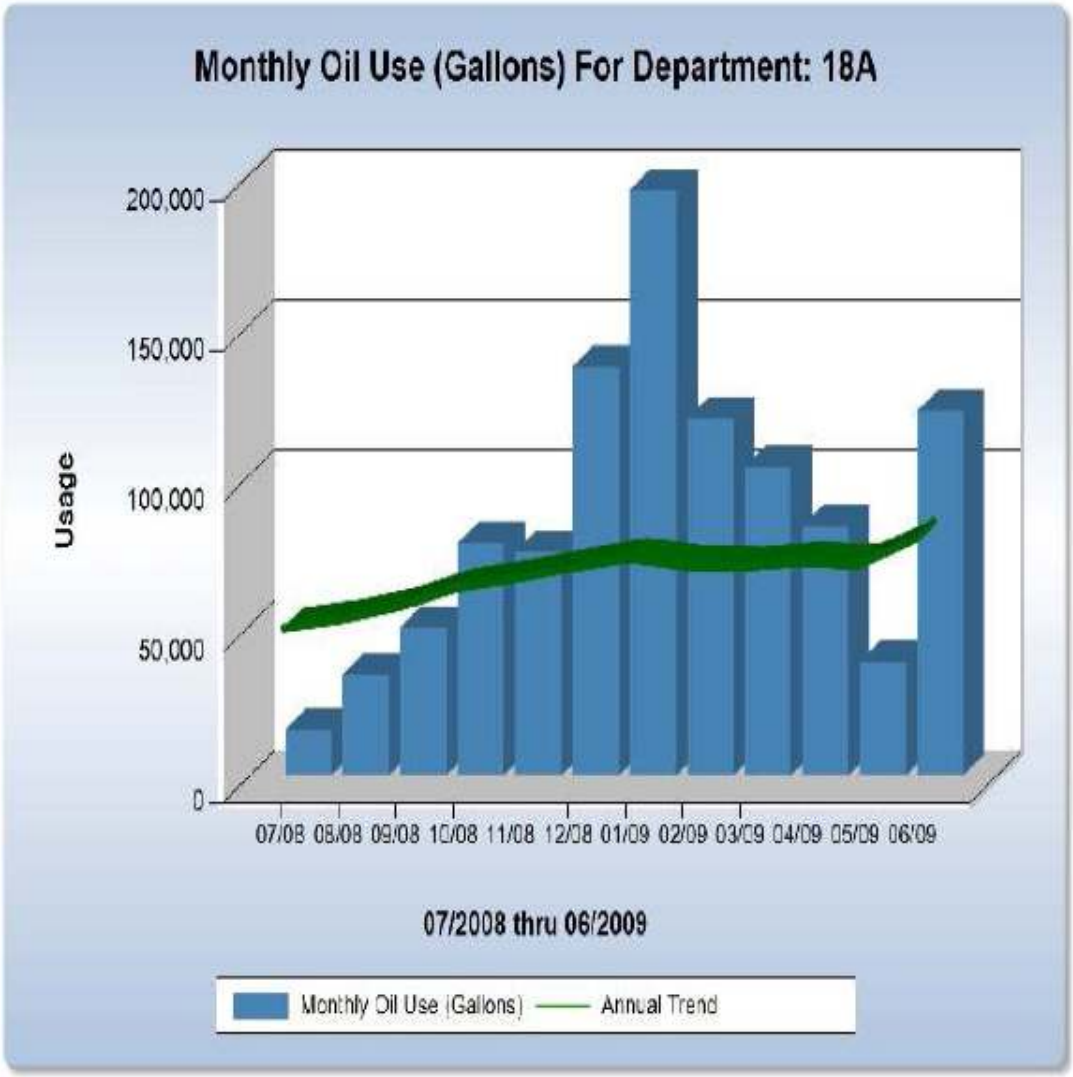


Monthly Electricity Use



Individual Utility Graph – Printed by: UM Online/Maine on 09/13/2009 at 1:14 PM – Data prorated into calendar month according to billing from and thru dates Page 1

Monthly Oil Use



Individual Utility Graph – Printed by: UM Online/Maine on 06/13/2009 at 1:16 PM – Data prorated into calendar month according to billing from and thru dates

Page 1

State of Maine, Department: 18A
Energy Use Ranking – 07/2008 thru 06/2009

Site	Electricity (kWh)	Natural Gas (Therms)	Other Fuels (MBtu)	Total Energy (MBtu)	% Chg	$/sqFt	kBtu/sqFt
Cross Office Complex	25,212,727	N/A	22,412	105,614	N/A	0	N/A
East Campus	7,004,635	N/A	57,826	81,726	N/A	505,676	101
Maine Criminal Justice Academy	1,864,990	N/A	7,540	13,902	N/A	0	N/A
DHS Augusta	N/A	N/A	11,614	11,614	N/A	76,000	153
Pre-Release Center	594,015	N/A	7,626	9,796	N/A	2,137	4,584
Bureau Alch Bev & Lottery Oper.	1,005,353	N/A	4,110	7,540	N/A	60,755	124
DHHS - Medical Services	1,095,981	N/A	0	3,739	N/A	65,912	57
State Police Crime Lab	674,320	N/A	914	3,214	N/A	8,187	394
DHS Bangor	746,948	N/A	0	2,549	N/A	44,808	57
DHHS - Client Services	697,697	N/A	0	2,301	N/A	45,600	51
DHHS/ Child and Family	580,705	N/A	0	2,323	N/A	29,993	77
Dept of Labor Bldg (Augusta)	N/A	N/A	1,752	1,752	N/A	40,530	43
DHHS - Skowhegan	492,762	N/A	0	1,681	N/A	16,021	104
DHHS/WAS - Hallowell	399,111	N/A	0	1,362	N/A	16,800	81
DHHS - Caribou	N/A	N/A	763	1,277	N/A	20,046	61
State Police HQ - Augusta	347,316	N/A	0	1,185	N/A	0	N/A
Agency on Aging	N/A	N/A	0	974	N/A	0	N/A
Central Fleet Maintenance	N/A	N/A	944	944	N/A	10,948	86
DHHS - Bidderford	270,477	N/A	0	923	N/A	20,966	44
DHHS - Rockland	N/A	N/A	0	886	N/A	29,045	32
Labor Unemployment Comp-Bangor	211,852	N/A	0	723	N/A	21,746	33
Maine Revenue Services	197,335	N/A	0	673	N/A	14,000	48
Public Utilities	N/A	N/A	603	603	N/A	25,132	24
Admin & Financial Svcs	158,794	N/A	0	542	N/A	8,578	63
DHHS - 161 Capitol St	124,120	N/A	0	498	N/A	694	665
Baker Building	N/A	N/A	451	451	N/A	9,653	47
Blaine House	N/A	N/A	439	439	N/A	8,653	50
Cleveland Building	N/A	N/A	429	429	N/A	5,994	72
Gannet Building	N/A	N/A	338	338	N/A	7,840	45
DHHS - Ellsworth	98,519	N/A	0	336	N/A	11,725	28
Hayden Building	N/A	N/A	299	299	N/A	6,216	48
Bureau of Motor Vehicles - Portland	87,166	N/A	0	297	N/A	7,319	41
Nash School	N/A	N/A	265	265	N/A	7,436	36
Central Printing	N/A	N/A	0	265	N/A	9,000	29
DHHS - Madrak	76,452	N/A	0	261	N/A	13,918	19
Administration - Hallowell	N/A	N/A	299	299	N/A	5,420	48
DHHS/DSA	N/A	N/A	0	261	N/A	47,916	5
Dept. of Labor - Presque Isle	N/A	N/A	0	245	N/A	12,000	19
DHHS - Houlton	N/A	N/A	0	236	N/A	0	N/A
DHHS - S. Paris	69,035	N/A	0	236	N/A	9,600	25
Dashlager House	N/A	N/A	216	216	N/A	1,640	133
Dept. of Corrections-S. Paris	60,365	N/A	0	206	N/A	0	N/A
Medical Examiner	N/A	N/A	168	168	N/A	9,645	17
DIT	N/A	N/A	0	166	N/A	0	N/A
McLean House	N/A	N/A	157	157	N/A	3,653	45
Labor Unemployment Comp-Augusta	N/A	N/A	0	159	N/A	13,000	12
Dept. of Labor - Rockland	N/A	N/A	0	159	N/A	8,477	19
Unknown/97	N/A	N/A	0	158	N/A	0	N/A
Smith House	N/A	N/A	151	151	N/A	3,326	46
DHHS - Augusta	43,325	N/A	0	148	N/A	0	N/A
Information Technology	43,230	N/A	0	148	N/A	6,079	24
DHHS - Fort Kent	N/A	N/A	0	144	N/A	7,055	20
Farmington-Consv/Conv.Admin	39,175	N/A	0	134	N/A	4,675	29
Bureau of Motor Vehicles - Bangor	39,045	N/A	0	133	N/A	5,000	27

Energy Use Ranking – Printed by: UM Orono/Maine on 09/13/2009 at 9:49 AM – Data provided into calendar month according to billing from and thru dates – % Change based on site comparison yr – N/A indicates missing data

Page 1

State of Maine
Analysis of Use and Cost Changes - Oil
Department: 18A (All Sites)

	Year ending 06/09			Year ending 06/08			Percent (%) Change		Amount of Change in Cost		
Site	Use (Gallons)	Cost	Unit Cost ($/Gallons)	Use (Gallons)	Cost	Unit Cost ($/Gallons)	Unit Cost ($/Gallons)	Use (Gallons)	Due to Unit Cost	Due to Use	Total Change
Administration - Hallo..	2,156	$7,885	3.7081	2,324	$7,223	3.0427	21.8%	-8.2%	$1,588	-$905	$771
Baker Building	3,780	$14,078	3.7441	4,248	$12,445	2.9309	27.7%	-11.4%	$3,453	-$1,820	$1,633
Blaine House	2,549	$9,540	3.7433	3,433	$10,697	3.1158	20.1%	-25.8%	$2,154	-$3,309	-$1,155
Bureau Alch Bev & L..	34,094	$122,483	3.5919	15,002	$40,559	3.1835	10.0%	126.9%	$7,431	$68,493	$75,924
Bureau of Motor Vehi..	709	$2,649	3.7419	816	$2,465	3.0206	23.9%	-13.2%	$589	-$404	$185
Central Fleet Mainte..	7,865	$28,570	3.6325	4,600	$15,073	3.3486	8.4%	74.8%	$1,273	$12,223	$13,497
Cleveland Building	3,578	$13,382	3.7427	3,675	$11,288	3.0706	22.1%	-2.6%	$2,488	-$363	$2,126
Cross Office Complex	244,782	$910,473	3.7195	210,503	$687,975	3.1752	17.2%	16.3%	$114,993	$127,503	$242,497
Dashlager House	1,817	$6,600	3.7425	2,449	$7,509	3.0660	22.1%	-25.8%	$1,657	-$2,365	-$709
Dept of Labor Bldg (v..	16,430	$62,141	3.6134	9,600	$27,839	2.9006	23.3%	51.0%	$6,488	$17,814	$24,302
DHS Augusta	94,336	$330,433	3.5081	78,425	$242,117	3.0872	16.5%	20.3%	$40,065	$67,251	$107,317
East Campus	481,874	$1,755,086	3.6421	226,118	$676,313	2.9910	21.8%	113.1%	$147,247	$931,496	$1,078,743
Gannet Building	2,617	$10,548	3.7448	2,301	$6,887	2.9930	25.1%	22.4%	$1,730	$1,832	$3,563
Hayden Building	2,488	$9,775	3.5289	1,875	$5,582	2.9864	18.0%	32.7%	$1,051	$2,162	$3,213
Maine Criminal Justic..	61,668	$223,970	3.6319	46,600	$139,642	2.9968	21.2%	32.3%	$29,602	$54,725	$84,327
McLean House	1,384	$5,231	3.7810	1,672	$5,070	3.0331	24.7%	-16.0%	$1,200	-$1,040	$160
Medical Examiner	1,401	$5,242	3.7419	2,010	$6,117	3.0299	23.5%	-30.0%	$1,437	-$2,312	-$875
Merrill House	1,066	$3,987	3.7402	1,055	$3,110	2.9476	26.8%	1.0%	$836	$41	$877
Nash School	2,372	$8,882	3.7443	2,411	$7,113	2.9501	26.8%	-1.6%	$1,915	-$146	$1,769
Pre-Release Center	61,900	$223,405	3.6091	47,349	$142,770	3.0159	19.7%	30.7%	$28,118	$52,518	$80,635
Public Utilities	5,024	$18,800	3.7421	5,856	$17,813	3.0419	23.0%	-14.2%	$4,100	-$3,113	$987
Smith House	1,262	$4,700	3.7245	1,157	$3,404	2.9420	26.6%	9.1%	$906	$391	$1,296
Staff House & Garage	N/A	N/A	N/A	979	$2,992	3.0559	N/A	N/A	N/A	N/A	N/A
State Police Crime L..	6,436	$24,090	3.7430	8,958	$28,050	3.1312	19.5%	-28.2%	$5,480	-$9,440	-$3,960
Company Totals:	**1,035,717**	**$3,860,248**	**3.6551**	**683,275**	**$2,096,869**	**3.0676**	**19.2%**	**52.2%**	**$405,795**	**$1,301,428**	**$1,707,223**

Energy/SqFt Ranking

State of Maine, Department: 18A
Energy/SqFt Ranking -- 07/2008 thru 06/2009

Site	SqFt	Electricity (kWh)	Total Elec Cost	Cost/kWh	Total Elec Cost/SqFt	Natural Gas (Therms)	Natural Gas Cost	Cost/Therm	Natural Gas Cost/SqFt	Total Energy Cost/SqFt
Pre-Release Center	2,137	694,016	$88,771	$0.128	$41.5400	N/A	N/A	N/A	N/A	$146.0812
DHHS - 161 Capitol St	584	134,125	$10,459	$0.078	$15.2916	N/A	N/A	N/A	N/A	$15.2916
State Police Crime Lab	8,157	674,325	$46,663	$0.069	$5.7205	N/A	N/A	N/A	N/A	$8.8839
DHS Augusta	76,080	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$4.5219
Dashlager House	1,540	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$4.1464
Bureau Alch Bev & Lottery Oper.	50,765	1,005,383	$72,679	$0.072	$1.1951	N/A	N/A	N/A	N/A	$3.2187
East Campus	808,676	7,004,638	$493,686	$0.070	$0.6105	N/A	N/A	N/A	N/A	$2.7808
Central Fleet Maintenance	10,948	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$2.5096
Cleveland Building	5,994	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$2.2342
DHHS - Skowegan	16,091	492,752	$35,806	$0.072	$2.2066	N/A	N/A	N/A	N/A	$2.2066
DHHS/IAS - Hallowell	16,800	399,111	$29,519	$0.074	$1.7571	N/A	N/A	N/A	N/A	$1.7571
Bureau of Motor Vehicles - Portl..	7,319	87,155	$12,485	$0.143	$1.7059	N/A	N/A	N/A	N/A	$1.7059
DHHS/ Child and Family	29,993	630,788	$46,217	$0.071	$1.5076	N/A	N/A	N/A	N/A	$1.5076
Labor Unemployment Comp-Ba..	21,745	211,852	$34,042	$0.161	$1.5655	N/A	N/A	N/A	N/A	$1.5655
Merrill House	2,539	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$1.5108
Admin & Financial Svcs	8,578	158,784	$12,728	$0.080	$1.4838	N/A	N/A	N/A	N/A	$1.4838
Administration - Hallowell	5,420	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$1.4750
Baker Building	9,593	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$1.4524
Blaine House	8,563	N/A	$1,111	$0.112	$0.1282	N/A	N/A	N/A	N/A	$1.4253
McLean House	3,583	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$1.4202
Smith House	3,325	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$1.4136
Hayden Building	6,216	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$1.4117
Gannet Building	7,540	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$1.3991
DHHS - Caribou	25,046	N/A	$23,513	$0.156	$0.9388	N/A	N/A	N/A	N/A	$1.3706
DHS Bangor	44,808	745,948	$61,122	$0.082	$1.3641	N/A	N/A	N/A	N/A	$1.3641
Farmington-Conserv/Corr/Judicial	4,575	39,173	$6,188	$0.158	$1.3526	N/A	N/A	N/A	N/A	$1.3526
Bureau of Motor Vehicles-Caribou	4,337	N/A	$5,631	$0.156	$1.3445	N/A	N/A	N/A	N/A	$1.3445
Dept. of Corrections-Damariscotta	960	N/A	$1,264	$0.158	$1.3170	N/A	N/A	N/A	N/A	$1.3170
DHHS - Ellsworth	11,795	98,519	$15,412	$0.156	$1.3066	N/A	N/A	N/A	N/A	$1.3066
Bureau of Motor Vehicles - Bang..	5,000	39,046	$6,471	$0.166	$1.2943	N/A	N/A	N/A	N/A	$1.2943
Dept of Labor Bldg (vacant)	40,530	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$1.2865
DHHS - Rockland	28,045	N/A	$35,998	$0.139	$1.2836	N/A	N/A	N/A	N/A	$1.2836
Nash School	7,438	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$1.1941
DHHS - Medical Services	65,912	1,095,981	$77,662	$0.071	$1.1783	N/A	N/A	N/A	N/A	$1.1783
Maine Revenue Services	14,000	197,246	$15,259	$0.077	$1.0899	N/A	N/A	N/A	N/A	$1.0899
DHHS - Client Services	46,880	697,697	$49,596	$0.071	$1.0579	N/A	N/A	N/A	N/A	$1.0579
DHHS - S. Paris	9,600	69,656	$10,153	$0.146	$1.0576	N/A	N/A	N/A	N/A	$1.0576
Information Technology	6,079	43,230	$6,373	$0.147	$1.0484	N/A	N/A	N/A	N/A	$1.0484
DHHS - Biddeford	20,986	270,477	$19,809	$0.073	$0.9439	N/A	N/A	N/A	N/A	$0.9439
DHHS - Fort Kent	7,085	N/A	$6,677	$0.158	$0.9425	N/A	N/A	N/A	N/A	$0.9425
DHHS - Machais	13,918	76,482	$12,496	$0.163	$0.8978	N/A	N/A	N/A	N/A	$0.8978
Dept. of Labor - Presque Isle	12,880	N/A	$11,233	$0.157	$0.8722	N/A	N/A	N/A	N/A	$0.8722
Dept. of Labor - Rockland	8,477	N/A	$7,218	$0.155	$0.8515	N/A	N/A	N/A	N/A	$0.8515
Bureau of Motor Vehicles-Topsh..	4,230	N/A	$3,280	$0.152	$0.7755	N/A	N/A	N/A	N/A	$0.7755
Public Utilities	25,132	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$0.7481
Dirigo Health	7,113	30,328	$4,538	$0.150	$0.6380	N/A	N/A	N/A	N/A	$0.6380
Bureau of Motor Vehicles-Ellsw..	3,900	13,365	$2,311	$0.173	$0.5924	N/A	N/A	N/A	N/A	$0.5924
Bureau of Motor Vehicles-Antho..	6,354	24,509	$3,700	$0.151	$0.5823	N/A	N/A	N/A	N/A	$0.5823
Medical Examiner	9,545	N/A	$0	N/A	N/A	N/A	N/A	N/A	N/A	$0.5435
Labor Unemployment Comp-Au..	13,000	N/A	$6,852	$0.147	$0.5270	N/A	N/A	N/A	N/A	$0.5270
Bureau of Motor Vehicles-Thom..	4,344	13,205	$2,004	$0.152	$0.4612	N/A	N/A	N/A	N/A	$0.4612
Professional & Finance Regs-Po..	851	1,586	$346	$0.218	$0.4063	N/A	N/A	N/A	N/A	$0.4063
Central Printing	9,000	N/A	$3,343	$0.043	$0.3715	N/A	N/A	N/A	N/A	$0.3715
Dept. of Public Safety - Thomast..	2,400	4,828	$806	$0.167	$0.3360	N/A	N/A	N/A	N/A	$0.3360

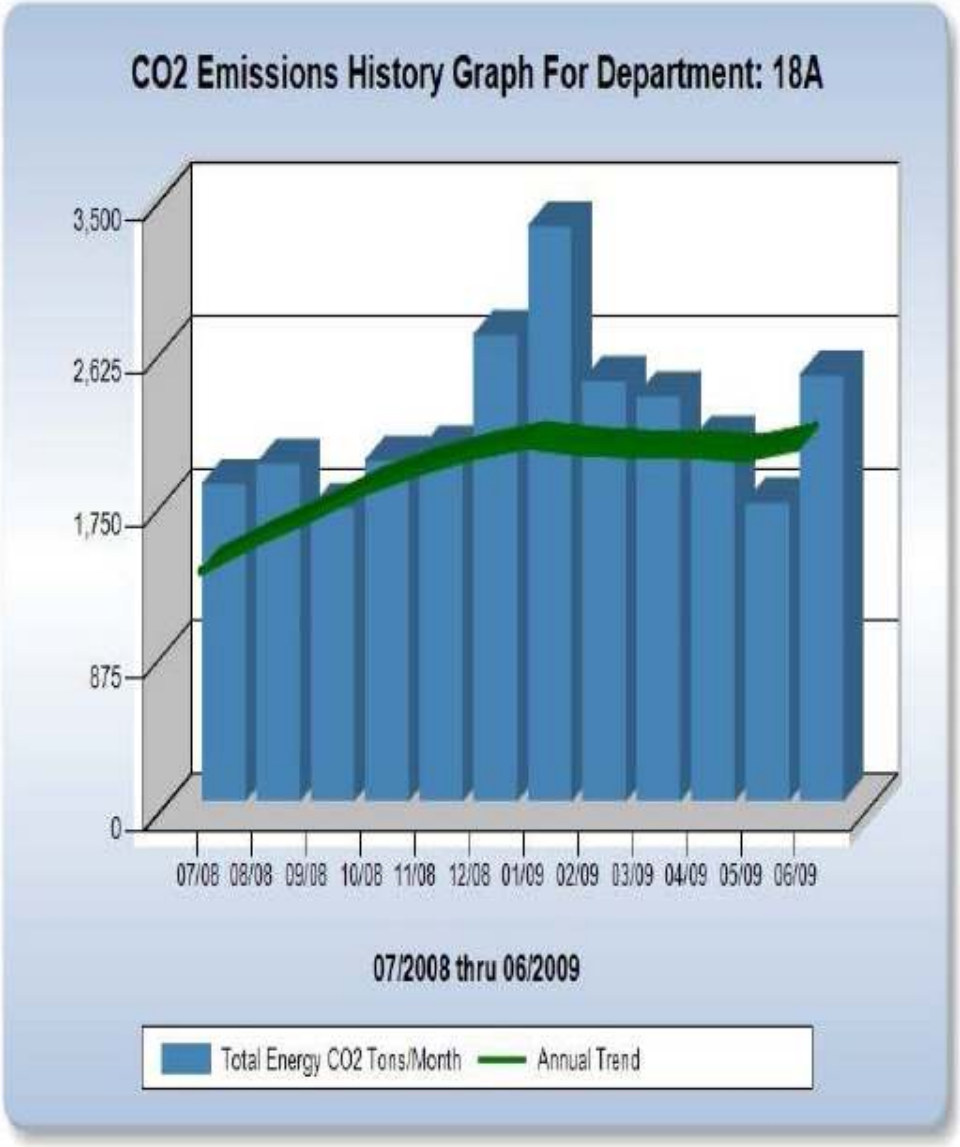
Energy/SqFt Ranking -- Printed by: UM Online/Maine on 08/13/2009 at 9:49 AM -- Data prorated into calendar month according to billing from and thru dates -- N/A indicates missing data

Page 1

Carbon Emission Reporting

- Energy users have become increasingly aware of the link between energy consumption and the creation of CO2, a greenhouse gas that causes global warming. As a result, government agencies are actively participating in programs that are aimed at reducing both energy use and emissions.
- Utility Manager provides a set of reports that support client efforts to understand and manage an organization's greenhouse gas emissions. The reports provide the following useful information:
  - Quantify, track, and report CO2 emissions over time
    - Employs current factors from EPA and eGRID database to translate historical data into emissions
  - User-friendly graphs promote adoption and expansion of conservation programs
    - Translate emissions reduction into equivalent values such as cars removed from roads, acres of trees required to offset CO2, single-family homes
  - "Carbon footprint" awareness
    - Preparation for potential legislation to publicly disclose emissions or "cap/trade" programs

Carbon Emissions History Graph



CO2 Emissions History

State of Maine, Department: 18A
CO2 Emissions History Report

Date	Electricity (Tons CO2)	Natural Gas (Tons CO2)	Oil (Tons CO2)	Wood (Tons CO2)	Propane (Tons CO2)	Total Energy (Tons CO2)
07/08	1,671.1	0.0	141.4	0.0	3.7	1,816.1
08/08	1,609.5	0.0	318.7	0.0	3.7	1,931.9
09/08	1,198.9	0.0	468.0	0.0	9.9	1,676.8
10/08	1,204.8	0.0	737.2	0.0	7.9	1,949.9
11/08	1,289.3	0.0	710.0	0.0	8.6	2,007.9
12/08	1,357.2	0.0	1,299.4	0.0	15.8	2,672.5
01/09	1,413.1	0.0	1,863.0	0.0	18.4	3,294.5
02/09	1,258.7	0.0	1,133.7	0.0	13.9	2,406.3
03/09	1,330.0	0.0	980.0	0.0	9.6	2,319.6
04/09	1,255.8	0.0	792.3	0.0	4.4	2,052.5
05/09	1,346.4	0.0	360.1	0.0	2.7	1,709.2
06/09	1,273.8	0.0	1,158.7	0.0	6.9	2,439.3
Annual Total	**16,218.5**	**0.0**	**9,962.6**	**0.0**	**105.5**	**26,286.5**

Data Driven Solution

Our solution creates the ability to analyze individual facility usage, verify savings from efficiency initiatives, and provide meaningful reporting for the State of Maine and how they consume energy.

- Identify usage anomalies
- Track and compare usage and costs at different sites
- Identify trends and make accurate projections
- Establish baselines for use in measuring the effectiveness of performance contracts and energy efficiency projects with the ability to adjust to account for operational change
- Employee and organizational energy usage modifications are easily measured
- Improve energy management effectiveness

Energy management is a continual process

COLLECT — Centralized capture of utility bill and meter data

ANALYZE — Establish cost/usage benchmarks and analyze data for savings opportunities

REDUCE — Implement programs to reduce energy cost and consumption

VERIFY — Measure results and adjust accordingly

REPEAT — Energy management is a continual process

Appendix F

PUBLIC Law, Chapter 372 LD 1485, item 1, 124th Maine State Legislature
An Act Regarding Maine's Energy Future

PART I

Sec. I-1. Task force established. The Commissioner of Administrative and Financial Services shall establish a task force, referred to in this Part as "the task force," to advance energy efficiency, conservation and independence at state facilities. The members of the task force include:

1. The Commissioner of Administrative and Financial Services, who serves as chair;

2. The Director of the Governor's Office of Energy Independence and Security within the Executive Department or the director's designee;

3. The Commissioner of Environmental Protection or the commissioner's designee;

4. The director of the property management division within the Department of Administrative and Financial Services;

5. The chair of the Public Utilities Commission or the chair's designee;

6. The Director of the State Planning Office within the Executive Department or the director's designee; and

7. Other individuals appointed by the Commissioner of Administrative and Financial Services to serve on the task force who have demonstrated an interest in the energy issues of the State from the private, public or nonprofit sector.

Sec. I-2. Chair to convene task force. The task force shall meet at times and places called by the chair. The task force may accept staffing, financial and other administrative or program support from the agencies of State Government or from outside sources as it determines appropriate to its duties. Members serve without compensation.

Sec. I-3. Task force responsibilities. The task force shall examine ways of advancing the goals of improving energy efficiency, increasing energy conservation and increasing the energy independence of the State by better management of state facilities. The task force shall develop recommendations that, to the extent possible, do not require additional state positions or increased appropriations from the General Fund.

Sec. I-4. Reporting date established. The task force shall report its findings and recommendations to the Governor and to the Joint Standing Committee on State and Local Government and to the Joint Standing Committee on Utilities and Energy no later than December 1, 2009.

Sec. I-5. Authority to submit legislation. The task force is authorized to submit legislation to the Second Regular Session of the 124th Legislature.

Appendix G

Excerpts from State of Maine Comprehensive Energy Plan 2008-2009

This appendix includes excerpts from the state energy plan promulgated by the State Energy Office which are relevant to state facilities.

In addition, this section includes information that is responsive to 2007 Resolve, Chapter 183, Section 5.

Reducing peak-load energy consumption: Since the time of 2007 Resolve, Chapter 183, the State of Maine has entered into a contractual agreement to reduce peak-load energy consumption through a so-called demand response program. Maine's private-sector partner is EnerNOC, which was selected as the result of a public, competitive process. The State through EnerNOC has enrolled multiple facilities with a total demand response capacity of 2,405 kW. The West Campus of State Government in Augusta, which includes the State House, is among the locations enrolled in the demand response program. More facilities have been and will be identified for potential enrollment and will be pursued.

Reuse of waste heat: The major initiative in this area is a plan to install a co-generation or tri-generation energy system at the East Campus of State Government in Augusta, which is currently the largest single consumer of heating fuel in the executive branch infrastructure. Several rounds of initial assessment have been completed in the 2007-2009 period. The initial assessments have indicated a combined heat and power application with a fuel source other than oil could payback the initial investment in under 10 years. A substantial and more detailed assessment is expected to be completed for the Bureau of General Services in early 2010 by the firm Harriman Architect + Engineers.

From Page 10

STATE CONTEXT:

MAINE'S CURRENT ENERGY POLICY AND PROGRAM SUCCESSES:

The State's "Lead by Example" initiatives include purchasing 100% renewable electricity for state government operations paid for by energy conservation improvements in all state buildings; requiring the state to meet 30 mpg for passenger cars purchased for state use; reducing straight #2 heating fuel by about 13,000 gallons annually by the use of biodiesel on the Augusta campuses; requiring state buildings to incorporate LEED standards into the design, construction, operation and maintenance of any new, expanding or existing buildings; and Maine is increasing the number of efficient hybrid vehicles in the state fleet, with 90 hybrids to-date.

Update: BGS has increased its use of B5 over time and now uses 500,000 gallons of B5 bio-diesel to heat facilities on the Augusta Campuses

From Page 25

Goal:

Work with State Government to adopt an overall energy reduction goal at State facilities.

Objective:

Work with State agencies to identify potential energy efficiency opportunities at State facilities.

Implementation:

- Quantify energy usage, costs and annual savings at all State facilities, universities and schools and report back to the Legislature annually.
- Develop an energy reduction plan and implement it to decrease overall energy usage at State facilities.
- Work with State Government to adopt wholesale power purchasing.
- Work with the State energy efficiency entity to create outreach materials for all school districts building new or upgrading facilities.
- Continue to work with the University of Maine and Maine Community College to decrease energy usage.

Update: BGS and its energy advisor are developing a database to quantify usage, costs and savings at all state facilities, estimated initial completion expected October of 2009. BGS purchases wholesale fuel oil, electricity and natural gas through master agreements for all state facilities. BGS has set a goal of reducing its direct use of heating fuel (#2) by 5% by 2013 compared with 2008.

From Pages 25 and 26

Goal:
Work with State Government to adopt an overall goal of new, renewable power generation at State facilities.

Objective:
Work with Bureau of General Services (BGS), Maine Department of Transportation (MDOT), Maine Department of Education (MDOE), and other relevant State agencies to develop an aggressive plan for investing in the generation of clean renewable power at State facilities.

Implementation:

- Create an up-to-date data-base of existing facilities and their energy profiles.
- Reduce the State Government's dependence on oil by expanding the use of biomass and biofuels at State facilities.
- Develop screening criteria for identifying appropriate projects.
- Continue effort to use biomass and "bio-oil" at certain State facilities.
- Continue efforts to site small wind, solar and geothermal energy systems at State facilities.
- Pursue implementing co-generation plants at State facilities.
- Seek a substantial increase in funding for renewable energy upgrades through a substantial bond issue or other funding mechanism.

Update: On-site renewable energy projects are underway. A bio-mass plant will be installed at Mountain View Youth Development Center for the FY2011 heating season. A geothermal plant has been installed at the Skowhegan State Police barracks. A new more detailed study project for the East Campus to determine the best fuel type for a co-generation or Tri-generation plant is happening. In addition, BGS, its contracted energy advisor, and the Property Management division at BGS have all stepped up efforts to create a portfolio of information about the state's own energy consumption, both statewide and at the individual facility level.

From Page 26

Goal:

Continue to promote increased efficiency standards for all new construction.

Objective:

Support the Department of Public Safety and other relevant state agencies in the implementation of the newly enacted state wide energy and building codes.

Implementation:

- Work with and provide information to the Technical Building Codes and Standards Board in their effort to develop rules to resolve the conflicts between the Maine Uniform Building and Energy Code and the Fire and Life Safety Codes (Public Law Chapter 699, 2008.)
- Continue to evaluate and upgrade building codes and standards periodically to keep up with new technology and more efficient building techniques.

Update: BGS currently is working to review and update its laws and rules as necessary to implement the new statewide energy standards for construction when they become effective in the summer of 2010. BGS has not and does not intend to seek an exemption from those statewide standards.

From Pages 28 and 29

Goal: Reduce peak-load energy consumption in all sectors.

Objective:

Develop a plan to increase energy efficiency, conservation and to reduce peak-load energy consumption in existing and new state government buildings. (Resolve 183, 2008.)

Implementation:

- Work with BGS and other state agencies to issue a Request For Proposal (RFP) to procure a third-party energy response company to manage the state's demand response capabilities.
- Work with BGS and other state agencies to issue an RFP to procure a third-party energy response company to purchase wholesale power for State of Maine facilities.
- Submit a report by December 1, 2009 to the Utilities and Energy Committee that includes findings and recommendations and a plan for purchasing wholesale power and reducing peak consumption in state government buildings, together with any necessary implementing legislation. (Resolve 183, 2008.)
- Encourage the wide-spread use of demand response in government and the private sector through third party managers to decrease energy use and increase revenue streams.
- Expand participation from all sectors in regional demand response programs.
- Include "demand reduction induced price effect" when calculating energy efficiency program cost-effectiveness and the effects on overall pricing.

Update: BGS entered into a contract effective August 2009 to provide demand response services for all state facilities. The step was taken in partnership with the Department of Corrections and BGS and Correctional facilities will be the first enrolled in the program. This can be expanded to cover any state owned facility that has backup power generation capacity. BGS has a contract in place to assist the state in procuring wholesale power for state facilities.

From Page 34 and 35

Goal:
Seek to develop on-site clean, renewable energy projects at appropriate state facilities.

Objective:
Work with BGS, MDOE, MDOT, DOC and other state agencies to develop an aggressive plan for investing in clean renewable power at state facilities.

Implementation:
- Create an up-to-date data-base of existing facilities and their energy profiles.
- Develop screening criteria for identifying appropriate projects.
- Seek a dramatic increase in funding for energy upgrades through a substantial bond issue or systems or other funding mechanism.

Objective:
Continue to work with BGS, Department of Corrections and other state agencies to select a site suitable for micro-wind power.

Implementation:
- Obtain site plan for and determine best location for micro-wind site.
- Collect technical data for selected site including power interconnection and layouts.
- Perform precursory design to create project scope, budget and potential savings.
- Create project presentation for approval and funding by BGS or other agencies.

Objective:
Work with BGS and other state agencies to select a site suitable for solar thermal application.

Implementation:
- Obtain site plan for and determine best location for solar thermal site.
- Collect technical data for selected site including power interconnection and layouts.
- Perform precursory design to create project scope, budget and potential savings.
- Create project presentation for approval and funding by BGS or other agencies.

Objective:
Work with BGS and other state agencies to select a site suitable for geothermal energy application.

Implementation:
- Obtain site plan for and determine best location for geothermal site.
- Collect technical data for selected site including power interconnection and layouts.
- Perform precursory design to create project scope, budget and potential savings.
- Create project presentation for approval and funding by BGS or other agencies.

Update: On-site renewable energy projects are underway. A bio-mass plant will be installed at Mountain View Youth Development Center for the FY2011 heating season. BGS has installed a geothermal plant at the Skowhegan State Police barracks. A new more detailed study project for the East Campus to determine the best fuel type for a co-generation or Tri-generation plant is happening. In addition, to these projects, a wind study currently is underway in partnership with the Department of Corrections at the Mountain View Youth Development Center with the hope of developing that resource.

From Pages 37 and 38

Goal:

Assist in the development of "bio-fuel" and "bio-mass" energy plants using Maine renewable resources.

Objective:

Continue working with biomass and bio-oil companies on pilot projects.

Implementation:

- Continue working with biomass and bio-oil companies and collaborate on efforts for Maine.
- Create an action plan for biomass and bio-oil "off-take" projects in Maine and coordinate a site visit to biomass and bio-oil refineries with state and business leaders.
- Coordinate with the private sector regarding bio-oil transportation and distribution.
- Create project lists for fuel-oil to biomass or bio-oil conversions at State facilities.
- Prioritize the list.
- Research and coordinate DOE funding for piping retrofits.
- Create detailed project implementation schedule for all approved projects.

- Create and facilitate measurement and verification protocol for savings and emissions.

Example: A site has been selected to switch a facility from fuel oil to bio-mass; the Mountain View Youth Development Center in Charleston will have the boiler in place by the FY2011 heating season thus reducing the state's fuel oil consumption by 150,000 gallons. This is reduction in statewide facility fuel use of about 5 percent. The East campus study will also indicate which heating source will work best at that facility, which is the largest single fuel oil user of all state facilities at approximately 500,000 gallons annually.

From Page 38

Objective:

Work with the DOC regarding biomass and bio-oil refineries using indigenous Maine fiber.

Implementation:

- Work with DOC regarding a biomass and bio-oil refinery.
- Obtain all metrics for state owned woodlands considered for refinery fiber.
- Present project model to biomass and bio-oil companies for evaluation of potential State bio-mass and bio-oil refinery.

Objective:

Select a Maine State facility to switch to 100% biomass or bio-oil for heating.

Implementation:

- Continue working with BGS to select state facilities for migration from fuel-oil to biomass or bio-oil for heating.
- Obtain existing fuel oil usage data and physical plant data.
- Perform site audit to obtain site specific technical data and physical layouts.
- Perform precursory design to create project scope, budget and potential savings.
- Create project presentation for approval and funding by BGS or other agencies.

Objective:

Select a Maine State facility to switch bio-mass tri-generation or cogeneration.

Implementation:

- Work with BGS to select one state facility that is suitable for bio-mass energy projects.
- Perform site audit to obtain site specific technical data and physical layouts.
- Perform precursory design to create project scope, budget and potential savings.
- Create project presentation for approval and funding by BGS or other agencies.

Update: Switch to 100% biomass project is underway as described above. Co-generation or tri-generation is being further studied for east campus application. Efforts to switch to bio-oil (not blended oil, but pure bio-oil) have proved unsuccessful to date. Pilot projects have not yet yielded sustainable results for heat.

From Pages 39 and 40

Goal:
Increase use of bio-fuels and alternative energy in state-occupied buildings.

Objective:
Continue working with BGS and other relevant state agencies to monitor one state building's use of and eventual conversion to biomass or bio-oil.

Implementation:

- Continue discussions between biomass or bio-oil vendor and BGS staff.
- Work with BGS and other relevant state agencies to develop detailed scope of work and budget for biomass or bio-oil retrofit project.
- Obtain five years of fuel usage, electric usage, degree days and occupancy data.
- Create monitoring protocol for measurement and verification.
- Create monthly reports on performance.
- Create final report of findings and issue to OEIS and BGS.

Objective:
Work with BGS and other relevant state agencies to identify state facility for bio-mass application *(wood pellet or chips).*

Implementation:

- Identify one State facility that will switch to bio-mass for heating fuel.
- Create detailed scope of work and budget for bio-mass retrofit project.
- Obtain five years of fuel usage, electric usage, degree days and occupancy data.
- Create monitoring protocol for measurement and verification.
- Create monthly reports on performance.
- Create final report of findings and issue to OEIS and BGS.

Update: Switch to 100% biomass project is underway as described above. Co-generation or tri-generation is being further studied for east campus application.

From Pages 52 and 53

Goal:

Continue "lead by example" initiatives in Maine by implementing progressive energy policies applicable to State, County and local governments.

Objective:

Continue the "Clean Government Initiative" and expand upon current energy-saving policies.

Implementation:

- Continue purchasing 100% of "green electricity" at State facilities.
- Continue and increase the purchase of biofuels for heating at state facilities and expand to transportation fleet.
- Continue to incorporate LEED standards for all new and renovated state buildings.
- Continue to expand the hybrid car fleet from its current 90 hybrid cars.
- Continue to require state-purchased vehicles to meet 30 miles per gallon fuel economy.
- Continue to expand the purchase of environmentally friendly commodities and services.
- Continue to expand the purchase of paper and paper products with 30% post-consumer content.
- Pursue the purchase of "wholesale power" by all State facilities.

Update: The State continues to purchase Renewable Energy Credits to cover 100% of all electricity used by State facilities. These credits are generated from Maine hydro-electric plants in Rumford and Auburn.