

STATE OF NEW HAMPSHIRE, DEPARTMENT OF
ADMINISTRATIVE SERVICES

2013 STATEWIDE ENERGY CONSERVATION PLAN

RSA 21-I:14-C



Statewide Energy Conservation Plan

RSA 21-I:14-C

DECEMBER 1, 2013

The State of New Hampshire is currently working toward a goal of reducing fossil fuel consumption by 25 percent by 2025, in state buildings, on a square foot basis, compared to a 2005 baseline. In accordance with RSA 21-I:14-c, Energy Consumption Reduction Goal; Reports, the Department of Administrative Services (DAS) is required to submit an annual report on the State's progress toward reaching its energy reduction goal. Additionally the report shall identify problems which may prevent the state from achieving its goal. State agencies have access to a template via the State intranet, Sunspot, which allows them to report their building inventory, past energy reduction measures implemented, recommendations for future energy reduction methods, and a summary of their accomplishments and goals. As a summary of the State's progress over the last year, the State of New Hampshire Energy Management Annual Report is included as Appendix C to this report.

Individual agency reports have been received from all 15 large property-owning agencies and institutions (see Appendix A for specific agency plans). The McAuliffe-Shepherd Discovery Center is no longer a state agency and, therefore, no longer required to submit a plan. The plans varied in the amount of detail and the number of measures documented. Nearly 250 energy conservation measures, totaling roughly \$10 million in estimated implementation costs, were proposed by property-owning agencies. This was extrapolated based on the details that were given in the individual plans and is subject to change as project specifications are further developed. In addition, non-property owning agencies were provided with a simplified version of the template that allowed them to report on behavioral efforts that contribute to the state's overall goal of energy reduction. Eighteen plans were received from non-property owning agencies, boards, and commissions (See Appendix B for individual plans). Notably, plans were not received from the following groups that reported in 2012: Department of Agriculture, Markets, and Food; Department of Education; the NH Executive Council; Department of Labor; and the Board of Pharmacy.

As was the case in 2012, agencies submitted some low-cost (<\$1000) and no-cost measures and they were encouraged to get started on those right away, even without the assistance of the Energy Management Team. Often these smaller, simpler measures have quick payback periods and agencies can see immediate savings by performing the fixes themselves. There were definitely fewer of these measures proposed in 2013, which may be an indication that agencies are taking action even before including them in their annual conservation plan reports.

For the biennium covering fiscal years 2012 and 2013, the State Energy Management Unit was awarded \$500,000 in capital funds to spend on capital energy projects in state buildings. At the end of FY13, the State had spent \$465,000 of this on 17 projects for state agencies. The estimated annual energy savings for these projects totaled \$80,000 annually, resulting in an average payback period of 5.8 years. Many of the completed projects were lighting retrofits which continue to be good investments that provide large energy savings. Other completed projects include the installation of three wood boilers at DOT regional sheds. These boilers will allow DOT to see large reductions in its heating costs due to the availability of "free" wood fuel from roadside cleanup operations. DES was also able to install high efficiency heat pumps in some of its small remote air-monitoring stations. Strict climate control in these facilities is important due to temperature and humidity-sensitive equipment. These heat pumps will allow DES to maintain these conditions in the most energy efficient and cost effective manner.

The remaining \$35,000 in funding was rolled over to the current biennium and will be invested in further energy efficiency work in state buildings. State Energy Management staff are working to identify other sources of funding and are working with the NH Public Utilities Commission as well as local energy utilities to obtain rebates and incentives for energy projects. While these funds will help stretch the State energy dollars further, they are not a replacement for the capital appropriated funds used to do energy improvement projects in state buildings.

The State has recently reintroduced performance contracting as a way of completing large scale energy retrofits at no up-front cost to the State. Performance contracts are a way for agencies to have energy measures installed in their buildings by using their utility budgets to pay for the projects over time. Agencies see no difference in their total expenditures because the required payments are offset by reduced energy bills. Two Requests for Proposals (RFPs) were issued in 2013. One was issued in January 2013 for four buildings on Hazen Drive, including the Department of Safety Headquarters, the Department of Motor Vehicles, 27/29 Hazen Drive (which houses Health and Human Services, Information Technology, and Environmental Services), and the Department of Transportation Headquarters. Additionally, in September 2013 an RFP was issued for Cannon Mountain. Both of these projects will include comprehensive investment grade energy audits prior to construction of the agreed upon measures in 2014. There are more opportunities across the state to implement similar projects that can be expected to result in significant energy savings. Currently the number of RFPs that can be issued is limited due to the staff hours required to manage the projects. The goal is to issue 3 to 5 more RFPs over the next several years.

The Juvenile Justice Services facility in Manchester has forgone listing out individual measures that need addressing and has instead chosen to sign on to the performance contract initiative as one of the next campuses to be evaluated. This is a good direction for that agency as they have many old buildings, as well as some highly energy intense operations at their Manchester facility. Because of this, no prioritized measures have been listed in the detailed tables for Juvenile Justice Services. Other potential candidates for Performance Contracts may be identified based upon further review of the measures included in the agency conservation plans.

Again this year, many agencies included facility studies and audits in their proposed measures lists. Agencies are in need of help to determine what measures can be done in their buildings and which ones are cost effective. Providing agencies with a resource to get these studies completed in a timely manner and at minimal cost would greatly benefit the state. Several agencies were able to take part in retro-commissioning programs over the past year including the Fire Standards Training Facilities and New Hampshire Hospital. Retro-commissioning involves going back to a building's systems after time has passed and verifying that they are running as they were originally designed. The term "equipment drift," refers to situations in which equipment tends to operate less efficiently or out of a specified range, and is a very typical outcome after equipment has been in place for long periods of time. Getting the equipment operating back at its most efficient set-points and maintaining this performance over time is critical in reducing energy use and costs, as well as prolonging the life of the equipment. Fire Standards was able to fund the process themselves and the Hospital was awarded funding through the Office of Energy and Planning for its study. The results of both of these studies showed that there were many maintenance items and other improvements that could be made to the facilities to save energy and money; some of these measures had a payback period as short as 10 months.

The Energy Management team has prioritized the measures listed in the agency-level plans. For the current budget cycle (FY14/15) nearly \$1.2 million in possible measures have been identified. A

subset of these measures is underway, or will be, using the \$500,000 capital appropriation that was received for this biennium. Other measures will be completed through other funding sources, as part of a performance contract, or will be deferred until more funding becomes available. Additionally, agencies have identified more measures than they can reasonably complete with current staffing levels and budgets, so a second list of measures has been generated that will be used as a foundation for the FY16/17 capital budget request for Energy Conservation projects.

Some of the criteria that were considered when deciding which measures to include on each biennium's list were:

- The priority ranking given by the agencies;
- The amount of detail in the project proposal, including costs and energy savings;
- The ability to use state labor for installation;
- The payback period for the project;
- A fair distribution of funding across agencies;
- Consideration to whether a performance contract or other major changes would be taking place within select buildings in the near future; and
- Other benefits to the agencies, such as reduced maintenance costs and time, more comfortable and better operating buildings and systems, and replacement of equipment that has reached its end of life.

Projects are continually being identified by agencies, as systems fail and need to be replaced, new technologies become available or more affordable, or personnel become more educated on energy efficiency. These projects may be added to future lists, be done in addition to the ones already identified, or take the place of less urgent or other less favorable projects in the queue.

Non-property owning agencies are still struggling with identifying what they can do to be part of this initiative. This is evident by the limited number of plans that were received from agencies that do not own property. More effort needs to be put into education and outreach to this group of agencies as well as to individual employees throughout the State. If each employee were to do his or her part in the conservation effort, all buildings, whether state-owned or leased, could see additional energy savings. Often the actions by these employees come at no additional cost, making these the efficiency measures that have the quickest payback periods. Non-property owner conservation plans are being compiled in more detail to develop a training session that targets these agencies and teaches them some basic things they can do to make their buildings more efficient.

Plans were improved in 2013 in several ways. State Energy Management staff simplified the plan templates so that they were easier for the agencies to use while still collecting the most important information. Agencies also had the benefit of having previous experience with plans which made them easier to put together. More changes are planned for 2014, as the Energy Management Team would like agencies to put together plans that are more robust and more useful for both the agencies and the Team. Frequent communication throughout the year will help agencies to track completed and potential energy efficiency measures as they are completed or discovered. Agencies would also benefit from a well-informed, enthusiastic Energy Coordinator who could help assemble a comprehensive energy team within the agency. Agency energy teams including data management staff, facilities staff, and upper-management support, are critical in obtaining the energy saving results that are possible within the State.

Agencies identified roughly the same number of potential measures in 2013 that they did in 2012. However this does not account for all of the uncompleted measures from 2012. New measures were identified and included while some of the previously identified measures were removed from the list. It is unclear why agencies left out measures that have not yet been completed. Possible reasons could

be that agencies no longer saw value in those measures or they simply did not think to include them in the current plan. This does reinforce the notion that there are many more energy saving opportunities out there that have not been identified or developed by the agencies.

While the State has made significant progress toward its energy efficiency goals (see Appendix C for the Annual State Energy Report), a continued and sustained effort is needed to maintain these savings and to push further to ultimately reach, and hopefully exceed, the 2025 goal. Agencies are in need of more resources to be able to achieve these goals, including access to professional studies and audits, training, funding, and staff that are able to assist in the implementation of energy saving measures.

Appendix A: Agency Conservation Plans, Property Owners

1. The New Hampshire Adjutant General's Department
2. Department of Administrative Services
3. New Hampshire Department of Corrections
4. New Hampshire Employment Security
5. New Hampshire Department of Environmental Services
6. New Hampshire Fish and Game
7. New Hampshire Department of Health and Human Services
 - a. Glenciff Home
 - b. Juvenile Justice Services
8. New Hampshire Liquor Commission
9. New Hampshire Police Standards and Training Council
10. New Hampshire Department of Resources and Economic Development
11. New Hampshire Department of Safety
12. New Hampshire Department of Transportation
13. New Hampshire Veterans Home

Appendix B: Agency Conservation Plans, Non-Property Owners

1. New Hampshire Banking Department
2. New Hampshire Department of Cultural Resources
3. New Hampshire Board of Dental Examiners
4. Governor's Commission on Disability
5. New Hampshire Office of Energy and Planning
6. Family Mediator Certification Board
7. New Hampshire Guardian ad Litem Board
8. New Hampshire Department of Health and Human Services – Administratively Attached Boards
9. New Hampshire Commission for Human Rights
10. New Hampshire Insurance Department
11. New Hampshire Joint Board of Licensure and Certification
12. New Hampshire Judicial Branch
13. New Hampshire Judicial Council
14. New Hampshire Lottery Commission
15. New Hampshire Board of Mental Health Practice
16. New Hampshire Public Employee Labor Relations Board
17. New Hampshire Board of Tax and Land Appeals
18. New Hampshire Office of Veterans Services

Appendix C: Fiscal Year 2013, State of New Hampshire Energy Management Annual Report

Table 1: Prioritized Measures for Fiscal Year 2014/15

Agency	Measure Description	Building(s) Impacted	Estimated Measure Cost	Life of Measure (in years)	Expected Annual Energy Cost Savings	Simple Payback (years to recoup cost)
Adjutant General	Building Control Upgrades	Nashua, Lebanon, and Rochester	\$15,000	20	\$1,500	10.0
Adjutant General	Solar PV and LED Lighting	Various	\$25,000	15	\$2,500	10.0
Administrative Services	Insulate Steam Piping in Steam Room	Statehouse Annex, Dept. of Justice	\$10,000	15	\$8,600	1.2
Administrative Services	Reprogram Controls and Eliminate Motor Use	Emergency Operations Center	\$6,000	15	\$3,000	2.0
Administrative Services	Replace Outdoor HID Fixtures with LED	DOT Mechanical Services	\$17,000	16	\$2,000	8.5
Administrative Services	Building Control Upgrades	Various	\$18,000	15	\$2,000	9.0
Administrative Services	Building Control Replacement	Rockingham County Courthouse	\$60,000	15	\$6,000	10.0
Administrative Services	Building Control Replacement	Carroll County Courthouse	\$51,000	15	\$5,000	10.2
Administrative Services	Heating System Upgrades	Paint and Carpentry Shops	\$15,000	25	\$3,000	5.0
Administrative Services	Add Heating Zone	Thayer	\$65,000	30	\$7,500	8.7
Administrative Services	Lighting Upgrades	Thayer	\$40,000	16	\$4,500	8.9
Administrative Services	Lighting Upgrades	Main Building	\$5,000	16	\$504	9.9
Corrections	Add Energy Efficient Lighting	New Women's Prison	\$40,000	16	\$5,000	8.0
Corrections	Retrofit Lighting	Men's Prison - Concord	\$40,000	16	\$8,000	5.0
Employment Security	Air Sealing around Windows	Berlin, Conway, Claremont, Salem, Somersworth, Portsmouth, Laconia	\$37,500	15	\$2,600	14.4
Employment Security	Window Treatments to Prevent Solar Gain	Tobey	\$43,500	10	\$8,000	5.4
Environmental Services	Recommissioning of Building Systems	Wastewater Treatment Facility	\$40,000	8	\$8,000	5.0
Fish & Game	HVAC Replacement	Headquarters	\$30,000	15	\$14,000	2.1
Fish & Game	Lighting Upgrades	Headquarters	\$3,500	16	\$514	6.8
Glencliff	Connect Smaller Buildings to Biomass System	Birchwood, Carpenter Shop, Painter Shop, Cottage, Superintendent's House	\$20,000	15	\$5,000	4.0
Liquor	Adding Energy Efficiency to New Store Construction and Renovations	Various	\$40,000	25	\$6,000	6.7
Liquor	LED Lighting Pilot Project	Portsmouth Store	\$7,500	16	\$2,000	3.8
Liquor	Boiler Replacement	Headquarters	\$100,000	20	\$10,000	10.0
NH Hospital	Implementing Results of Retro-commissioning Study	Hospital	\$40,000	8	\$8,000	5.0
NH Hospital	Add Drives to Air Handlers and Pumps	Hospital	\$16,000	20	\$13,500	1.2
NH Hospital	Boiler Controls	Hospital	\$65,000	20	\$9,500	6.8
Police Standards	Boiler Replacement	Dorm	\$40,000	20	\$9,600	4.2
Police Standards	Parking Lot Lighting Upgrades	Office and Dorm	\$20,000	16	\$2,100	9.5
DRED	Retrofit Lighting	Bear Brook State Park	\$1,500	16	\$313	4.8
DRED	Retrofit Lighting	Greenfield State Park	\$2,500	16	\$250	10.0
DRED	Retrofit Lighting	Lake Francis	\$1,300	16	\$130	10.0
Safety	Building Envelope Improvements	Various	\$40,000	20	\$4,000	10.0
Safety	Lighting Upgrades	Troop G	\$10,000	16	\$1,000	10.0
Safety	HVAC Controls	Troops A, C, D, E, F, and G; Windham; and Warehouse	\$38,000	15	\$3,800	10.0
DOT	Vinyl Siding and Insulation	District 1	\$10,000	15	\$2,500	4.0
DOT	Remote Controls for Overhead Doors	District 2	\$1,500	10	\$750	2.0
DOT	Occupancy Sensors	District 3	\$3,500	20	\$500	7.0
DOT	Overhead Door Improvements	District 4	\$38,000	20	\$7,250	5.2
DOT	Adding Energy Efficiency to New Shed Construction	District 5	\$40,000	25	\$6,000	6.7
DOT	Outdoor Lighting Upgrades	Mechanical Services	\$8,000	10	\$1,720	4.7
DOT	Insulate Windows	Stickney Ave	\$10,000	8	\$2,000	5.0
DOT	Building Management System	Traffic A	\$30,000	15	\$4,200	7.1
Vets Home	Boiler Replacement	Vets Home	\$40,000	20	\$5,000	8.0
		TOTAL	\$1,184,300		\$197,331	6.0

Table 2: Prioritized Measures for Fiscal Year 2016/17						
Agency	Measure Description	Building(s) Impacted	Estimated Measure Cost	Life of Measure (in years)	Expected Annual Energy Cost Savings	Simple Payback (years to recoup cost)
Adjutant General	LED Exterior Lighting	Milford, Littleton, Portsmouth	\$150,000	16	\$15,000	10.0
Adjutant General	Boiler Replacement	Various	\$100,000	20	\$10,000	10.0
Administrative Services	Window Replacements	Main Building - Annex	\$100,000	30	\$7,500	13.3
Administrative Services	Energy Efficient, Low-flow Restroom Retrofits	Various	\$41,000	10	\$4,600	8.9
Administrative Services	Building Controls - New and Upgrades	Various Courthouses	\$93,000	15	\$10,000	9.3
Employment Security	HVAC Replacement	Somersworth, Claremont	\$120,000	15	\$14,000	8.6
Environmental Services	Electrical Submetering	Wastewater Treatment Facility	\$40,000	15	\$0	N/A
Environmental Services	Adding Energy Efficiency to New Monitoring Site Construction and Renovations	Various	\$40,000	25	\$6,000	6.7
Glenclyff	Convert to Steam	LaMotte	\$350,000	30	\$60,000	5.8
Liquor	Adding Energy Efficiency to New Store Construction and Renovations	Various	\$40,000	25	\$6,000	6.7
NH Hospital	Install Electronic Dampers	Hospital	\$80,000	30	\$15,000	5.3
NH Hospital	Variable Frequency Drives	Hospital	\$40,000	20	\$6,000	6.7
Safety	LED Exterior Lighting	Various	\$60,000	16	\$6,000	10.0
Safety	Lighting Controls	Various	\$25,000	15	\$2,500	10.0
DOT	Outdoor Wood Boiler	Hollis	\$23,000	15	\$3,500	6.6
DOT	Lighting Upgrades	Traffic	\$20,500	10	\$6,000	3.4
DOT	Lighting Upgrades	Traffic	\$20,500	10	\$6,000	3.4
		TOTAL	\$1,343,000		\$178,100	7.5