

STATE OF NEW HAMPSHIRE, DEPARTMENT OF
ADMINISTRATIVE SERVICES

2014 STATEWIDE ENERGY CONSERVATION PLAN

RSA 21-I:14-C



Statewide Energy Conservation Plan

RSA 21-I:14-C

DECEMBER 1, 2014

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 2014 Annual Report is included as Appendix C to this report.

Individual agency reports have been received from 14 of the 15 large property-owning agencies and institutions (see Appendix A for specific agency plans). The Department of Resources and Economic Development has not submitted a plan as of the date of this report. Plans were reviewed by staff from DAS and the Office of Energy and Planning (OEP). There were 156 energy conservation measures identified through the plans that could be completed to save the State energy and money. The estimated cost of these measures totals over \$26 million¹. Of the 156 measures identified, only 52 were mentioned in previous plans, indicating that new ideas for energy savings continue to be identified.

Very encouraging were the lists of measures completed in 2014. Agencies listed 128 measures that they completed within the past year. The cost to implement these measures was nearly \$9 million. Agencies have done a better job of documenting costs and energy savings of the projects they have completed. \$3.2 million of the projects were listed with an associated energy unit and dollar savings amount. Savings for these projects totaled \$524,000 annually with an average payback period of 6 years.

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. Twenty-two plans were received from non-property owning agencies, boards, and commissions (See Appendix B for individual plans). This includes one single plan uniting all of the boards and commissions that now reside together in the newly renovated Philbrook Center.

The Energy Management Office was awarded \$500,000 in capital funds for energy conservation projects in fiscal years 2014 and 2015. The State Energy Manager and staff took an approach to distribute the funds across property owning agencies so that each was able to complete some energy saving projects during the biennium. If agencies did not identify projects to use their allotted funds before an October 2014 deadline, remaining funds were pooled and redistributed to projects on a waiting list. This approach proved to be successful as more agencies were able to complete projects. It did however limit the amount of funding that was available for any one project. To date, \$498,000

¹ Measure costs provided by agencies include non-energy related components of some projects.

of the funds have been spent or committed resulting in \$100,000 in annual energy savings with a 5 year average payback.

Lighting projects continue to be popular due to the ease of installation and significant energy savings for minimal investment. Agencies are now making the switch to LED lighting in many applications due to the high efficiency, low maintenance, and newly reduced cost. Boilers and other HVAC measures were also a popular investment in 2014. More efficient equipment replaced older units that were at the end of their useful lifetimes. One unfortunate trend was the need to supplement other capital projects, specifically higher cost projects such as cooling towers, with additional energy efficiency funding to ensure that the most efficient equipment was installed. Often capital projects come in over budget and decisions need to be made on what can be cut from the project.

Another group of projects were done as a result of various studies that were completed recently. Retro-commissioning, when a building is evaluated and recommendations are made to bring it back to how it was designed to run, was performed at 3 locations and funded with agency budgets or federal grants. All three studies identified some quick payback items that were implemented through the use of energy capital funds. Additionally, the Department of Corrections was able to take advantage of a no-cost energy audit provided as part of Public Service of NH's energy efficiency programs. This audit will identify measures that will be implemented at the North Country Correctional Facility.

Finally, there were several unique measures implemented in 2014 as agencies are exploring the specific needs of their buildings and operations. These measures include spring-loaded water faucets at DRED parks, laundry equipment at the Veterans Home, window shades at the new Employment Security office, and a fireplace insert at a rest area. Renewable energy is being utilized as a way to meet the State's fossil fuel reduction goal in the form of wood boilers at several Department of Transportation facilities, and solar electric at several Department of Environmental Services air monitoring stations.

The State is in its second year of the performance contracting initiative started in FY13. Performance contracts are a way for agencies to have energy saving 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. The project on Hazen Drive consists of 4 buildings; the Department of Safety, the Division of Motor Vehicles, the Morton Building, and the Health and Welfare Building. The first two stages of this project have been completed, proposals were received in response to an RFP and an energy audit of the four buildings was completed and reviewed, and the construction phase is expected to start in 2015. The second project, located at Cannon Mountain, is preparing to start the audit phase of the project with hopes to start construction after the FY15 ski season. Other potential locations for performance contracting are the Youth Detention Center campus in Manchester, various buildings belonging to the Adjutant General's Department, liquor stores, courthouses, the Veterans Home, or various facilities owned by the Department of Safety.

In preparation for performance contracting, a facility may elect to defer any energy related upgrades so that they can be included in the overall project. Longer payback items are offset by energy measures with quicker paybacks and the blending of these projects is what makes the initiative successful.

More and more agencies are indicating in their conservation plans that energy studies are needed. Studies could be as simple as an evaluation of a single building system, or more complicated such as a

comprehensive building energy audit or retro-commissioning study. As mentioned earlier in this report, the State has seen success with several recent energy studies performed in State buildings. Often, measures can be identified that have small implementation costs with large energy savings.

The Energy Management team has prioritized the measures listed in the agency-level plans. For the next budget cycle (FY16/17) over \$1 million in possible measures have been identified (see Table 1). Additional work could be completed through energy performance contracts. Also, if agencies are able to complete energy studies, more measures may be uncovered. Some of the criteria that were considered when deciding which measures to include were:

- The priority ranking given by the agencies;
- The amount of detail in the project proposal, including costs and energy savings;
- 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
- Lower priority capital projects that may not receive funding in the next biennium.

While this list serves as an indication of the amount and type of projects that need to be done across the State, situations and technologies change over time and an agency's priorities may shift due to these circumstances. The Energy Management Office supports agencies in getting critical projects done quickly and also focuses on high energy saving projects that will provide the most benefit to the State.

Non-property owning agencies have made great strides this year with more of them submitting plans than in previous years. Some smaller agencies are working hard at developing agency or building-level energy teams to show that their employees can have an impact on the energy efficiency of the State. Popular measures listed in non-property owning conservation plans were: shutting off lights when not in use, shutting down computer and other related equipment at the end of the day, using task lighting when practical, keeping thermostats at appropriate set points, removing space heaters, and using timers on water coolers. Agencies also expressed interest in working with their building owners to relay energy saving ideas and to get them implemented. Many more non-property owning agencies have also indicated a dedicated energy coordinator for their agency who will help move these ideas forward.

The Energy Management Office has made several improvements to the template used to complete the agency-level conservation plans. More data was collected through drop-down menus to better standardize the responses from agencies. More information was automatically calculated based on agency inputs, again providing for standardization and fewer errors. Finally, the overall template was locked, preventing agencies from overwriting important formulas or other information and making it easier to compare the plans across agencies.

While the State has made significant progress toward its energy efficiency goals by reducing fossil fuel use in state buildings by 20% (see Appendix C, Annual State Energy Report, for more information), 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. Glencliff Home
 - b. Juvenile Justice Services
 - c. New Hampshire Hospital
8. New Hampshire Liquor Commission
9. New Hampshire Police Standards and Training Council
10. New Hampshire Department of Safety
11. New Hampshire Department of Transportation
12. New Hampshire Veterans Home

Appendix B: Agency Conservation Plans, Non-Property Owners

1. New Hampshire Department of Agriculture, Markets, and Food
2. New Hampshire Banking Department
3. New Hampshire Department of Cultural Resources
4. Governor's Commission on Disability
5. New Hampshire Department of Education
6. New Hampshire Office of Energy and Planning
7. Family Mediator Certification Board
8. Office of the Governor
9. New Hampshire Guardian ad Litem Board
10. New Hampshire Department of Health and Human Services – Administratively Attached Boards
11. New Hampshire Commission for Human Rights
12. New Hampshire Department of Information Technology
13. New Hampshire Insurance Department
14. New Hampshire Joint Board of Licensure and Certification
15. New Hampshire Judicial Council
16. New Hampshire Department of Labor
17. New Hampshire Lottery Commission
18. New Hampshire Public Employee Labor Relations Board
19. New Hampshire Public Utilities Commission
20. New Hampshire Department of Revenue Administration
21. New Hampshire Board of Tax and Land Appeals
22. New Hampshire Office of Veterans Services

Appendix C: Fiscal Year 2014, State of New Hampshire Energy Management Annual Report

Table 1: Prioritized Measures for Fiscal Year 2016/17 (As provided by departments in their agency-level plans)

Agency	Measure Description	Building(s) Impacted	Estimated Measure Cost	Expected Annual Energy Cost Savings	Simple Payback (years to recoup cost)	Footnote
Adjutant General	Lochnivar boilers - convert from fuel oil to natural gas	Rochester, Concord BLDG. M	\$200,000.00	\$16,250.00	12.3	
Administrative Services	10 Bathroom motion light switches	HHS & DoIT	\$500.00	\$436.80	1.1	
Administrative Services	2 new condensing boilers to replace old one	AOC	\$70,000.00	\$12,062.12	5.8	
Administrative Services	8 Bathroom motion light switches	Londergan Hall	\$350.00	\$349.44	1.0	
Administrative Services	10 Bathroom motion light switches	Spaulding Hall	\$438.00	\$436.80	1.0	
Administrative Services	9 Bathroom motion light switches	Johnson Hall	\$275.00	\$393.12	0.7	
Administrative Services	Cooling Tower with VFDs	Rockingham County Courthouse	\$32,000.00	\$3,162.26	10.1	
Administrative Services	Replace Invensys BMS - Coos County and connect to server	Coos County - Lancaster	\$28,000.00	\$8,043.75	3.5	
Administrative Services	Replace Trane BMS system in Carroll County and connect to server	Carroll County - Ossipee	\$51,000.00	\$6,825.00	7.5	
Administrative Services	Insulate Steam Piping in Steam Room	Statehouse Annex, Dept. of Justice	\$10,000	\$8,600	1.2	
Administrative Services	Add Additional Zone of Heat	Thayer	\$85,000.00	\$18,900.00	4.5	*
Administrative Services	Replace lights with high efficiency LED lighting	Thayer	\$8,500.00	\$3,600.00	2.4	*
Administrative Services	Replace BMS in Rockingham County and connect to server	Rockingham County Courthouse	\$60,000.00	\$19,140.00	3.1	**
Administrative Services	Replace BMS in Jaffrey CC and connect to server	Jaffrey/Peterborough Circuit Court	\$12,500.00	\$4,225.00	3.0	*
Corrections	Remove exterior perimeter lighting: (6) high pressure sodium high mast type	Main campus, Concord	\$20,000.00	\$9,486.03	2.1	
Employment Security	Replace 1 HVAC Units	Claremont	\$25,000.00	\$12,100.00	2.1	
Employment Security	Replace 2 HVAC Units	Berlin	\$40,000.00	\$15,400.00	2.6	
Employment Security	Replace foyer glass entrance	Portsmouth	\$10,000.00	\$3,300.00	3.0	
Employment Security	Add foyer glass entrance	Laconia	\$12,000.00	\$2,300.00	5.2	
Employment Security	Replace roof and insulate	Salem	\$70,000.00	\$5,500.00	12.7	*
Fish & Game	Upgrade conference room lighting	NHFG Headquarters	\$5,000.00	\$960.00	5.2	
Fish & Game	Upgrade parking lot lights to LED	NHFG Headquarters	\$14,000.00	\$2,400.00	5.8	
Fish & Game	Upgrade T-12 lights to T-8	Region 2 office	\$5,000.00	\$960.00	5.2	*
NH Hospital	VFD's on chilled water pumps	APS	\$6,500.00	\$2,019.00	3.2	**
NH Hospital	Cooling tower filtration	APS	\$25,867.00	\$20,820.00	1.2	**
NH Hospital	Cooling tower VFD's	APS	\$7,600.00	\$3,000.00	2.5	**
NH Hospital	Repair ductwork leaks	APS	\$8,000.00	\$29,922.00	0.3	**
NH Hospital	VFD, on AHU # 5	APS	\$3,607.00	\$3,510.60	1.0	**
NH Hospital	VFD's for boilers, 1-3	APS	\$9,700.00	\$1,933.84	5.0	**
NH Hospital	VFD's for boilers, 4 & 5	APS	\$6,280.00	\$1,718.56	3.7	**
NH Hospital	Install outdoor temperature reset loop	APS	\$33,280.00	\$15,533.28	2.1	**
NH Hospital	Replace all steam traps	APS	\$60,640.00	\$11,677.56	5.2	**
NH Hospital	Replace boiler room actuators	APS	\$10,000.00	\$1,505.12	6.6	**
Police Standards	Boiler replacement	Police Standards Office / Dorm	\$40,000.00	\$2,561.75	15.6	
DOT	Replace overhead doors	PS516 - Londonderry	\$15,000.00	\$812.50	18.5	
DOT	Indoor LED lighting	Ossipee	\$5,200.00	\$2,050.00	2.5	
DOT	Indoor LED lighting	North Hampton	\$6,130.00	\$2,452.00	2.5	

DOT	Indoor LED lighting	Twin Mountain	\$7,035.00	\$2,483.00	2.8	
DOT	Alternative fuel heater	Patrol Shed 10	\$5,000.00	\$3,900.00	1.3	
DOT	Vinyl siding with insulation	Shed # 101U, 124, and 125	\$10,000.00	\$2,437.50	4.1	*
DOT	Outdoor wood furnace	Shed 124	\$12,000.00	\$7,800.00	1.5	*
DOT	Insulated garage doors	Shed # 104 and 105	\$6,500.00	\$3,575.00	1.8	*
DOT	HVAC control system upgrade	All toll facilities	\$15,000.00	\$27,625.00	0.5	*
DOT	Tri message sign LED replacements	All main barrier plazas	\$14,400.00	\$1,200.00	12.0	*
DOT	Supply natural gas to Dover Patrol Shed (PS 606) and install new gas boiler	Patrol Shed 606	\$10,000.00	\$1,196.00	8.4	*
DOT	Replace fluorescent lights with LEDs	District 6 Office	\$1,000.00	\$120.00	8.3	*
DOT	Parking Lot Street lights to LED	District 6 Office	\$800.00	\$60.00	13.3	*
DOT	Used oil furnace/burner (2nd one)	Twin Mountain	\$8,150.00	\$3,136.00	2.6	*
TOTAL			\$1,087,252	\$307,879	3.5	

*May have some agency funding to support this

**Submitted as a capital project, funding uncertain