

Ten Simple Strategies

for Reducing Municipal Energy Costs

By EMILY NEILL

From hybrid cars to the Live Earth concert, more and more consumers are making efforts to reduce their energy use and control their energy budget. Municipalities, as large energy consumers, don't have to shell out a lot of money on green technology in order to cut back on fossil fuels. There are a number of changes—both small and large in scale—that can bring financial benefits, while benefiting the environment.

At the state level, Governor Deval Patrick has issued an executive order setting higher standards for energy efficiency and mandating greater use of renewable energy throughout Massachusetts agencies. The order requires state government to reduce overall energy consumption by twenty percent from 2002 levels by 2012.

With a number of practical strategies, cities and towns can also cut back on energy use and reduce costs . . .



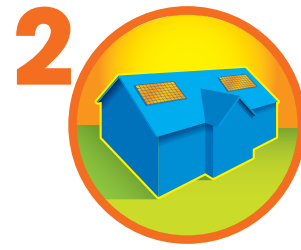
Compact Fluorescent Light Bulbs

It doesn't get much easier than changing a light bulb. Based on the average cost of electricity in Massachusetts (as of May 2006), every household in the state could save about \$93 per year for every five 100-watt standard incandescent light bulbs it replaces with five twenty-five-watt compact fluorescent light bulbs, according to OneBillionBulbs.com. This is a fraction of the savings a city or town could potentially realize by making the switch.

The environmental impact of compact fluorescent bulbs is another net gain: each bulb saves approximately 330 kilo-

watt hours of electricity over its life, translating to a reduction of about 400 pounds of carbon dioxide and other pollutants. An additional benefit is that compact fluorescents generate seventy percent less heat than standard bulbs, reducing the need for air conditioning and cutting electricity use another twenty percent, according to the U.S. Department of Energy.

Fluorescent bulbs contain trace amounts of mercury, so they should be disposed of properly (not thrown into the trash can, where they could be broken). Consumers should take advantage of local recycling options, where available. The U.S. Environmental Protection Agency is working with the manufacturers of compact fluorescents and major U.S. retailers to expand disposal options. Municipalities can encourage the use of compact fluorescents by promoting a convenient drop-off location or recycling center. For more information on bulb recycling centers, visit www.earth911.org.



Green Buildings

Building green can actually be cost-effective for Massachusetts municipalities, especially when factoring in tax breaks and other funding that is available for green projects.

Data from the 2002 pilot phase of the Massachusetts Technology Collaborative's Green Schools Initiative show average projected energy savings of thirty percent above state code requirements, with some projects anticipating savings of more than forty percent. A 2005 study of the incremental costs versus benefits of the energy and water efficiency elements found that the average incremental cost was three percent of total construction

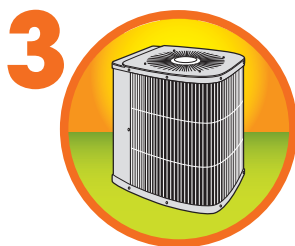
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costs (approximately one percent when all state and utility incentives and rebates were included). Over the building lifetime, however, savings from reduced energy and water use were projected to be eight times the incremental costs, with these costs being recouped in just three years. After that time, all savings accrue to the community.

The successful Green Schools Initiative led to the adoption of new state regulations requiring all new school or major renovation projects approved by the Massachusetts School Building Authority after July 1, 2007, to adopt numerous green design measures.

The Technology Collaborative recently teamed up with the School Building Authority in a broader Green Schools Initiative backed by \$15 million in grant money. Grant funds will be distributed to municipalities building energy-efficient public schools that include solar electric or wind power facilities on the school grounds. The Melrose Veterans Memorial Middle School was the first to receive an award under this new program. The city is using \$340,000 in grant funds to install a new thirty-kilowatt solar array on the school roof.

State Treasurer Timothy Cahill, who oversees the current school building program, calls the Green Schools Initiative a “no-brainer for cities and towns,” because the state assists in construction costs but does not share in the long-term savings.



Heating and Air Conditioning

Heating, ventilation and air conditioning systems account for forty percent to sixty percent of the energy used in commercial and residential buildings, according to the U.S. Department of Energy. This makes it a good target for potential energy savings.

Scheduled maintenance on HVAC systems, such as cleaning burners and air conditioning coils, replacing and cleaning air filters, and checking ducts and pipe insulation for damage, can maintain

efficiency. In schools, the boiler is usually the largest energy user in the building. Proper maintenance can lead to energy savings of ten percent to twenty percent, as well as reduced emissions, extended equipment life, and increased building occupant comfort.

While heating plays a large role in energy costs, New England is a “summer peaking” region because of the strain air conditioning puts on the region’s electric grid. An inefficient air conditioning system will only add to municipal electricity costs. According to a report prepared for the Department of Energy, the most common causes of degraded air conditioning performance are:

- Dirty filters and fans
- Improper belt alignment and adjustment
- Air leaks in equipment cabinets and ducts
- Improper air damper operation
- Dirty condenser and evaporator coils
- Improper refrigerant charge

Municipalities can also reduce energy use by monitoring proper operation of thermostats. Programmable thermostats, with a cost premium of \$50 to \$200, are highly cost-effective.

Some other common-sense measures include using window blinds, keeping doors and windows closed when the air conditioning or heater are operating, and adjusting the thermostat after hours.



Lighting

Energy Star, a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy, reports that lighting consumes twenty-five percent to thirty percent of energy in commercial buildings and is a primary source of heat gain and waste heat. Both small measures and complete upgrades are a relatively low-risk investment.

Some simple measures include installing occupancy sensors for rooms or closets

indoors, and motion sensors or time clocks on exterior parking lots and security lighting. Municipal buildings should have lighting levels to meet their needs, and any unneeded lamps, ballasts or fixtures should be removed.

Schools that still employ the older T-12 lighting technology should consider an upgrade. Lighting retrofits are a major renovation, however. The payback period for switching from T-12 to Super T-8 lighting with electronic ballasts may be three years or more. But in the long-run, there will be savings.

The benefits of implementing an energy-efficient lighting system go beyond savings. A 2005 study by the Carnegie Mellon University Center for Building Performance found that high-performance lighting fixtures in schools can impact productivity of students between 0.7 percent and 26.1 percent. The high-performance lighting attributes included efficient lighting and the use of indirect lighting fixtures.



Office Equipment

Several energy-efficient options from Energy Star may offer tax breaks as well as electricity savings for new office equipment for municipal buildings or schools. Energy Star copiers, for example, can achieve savings of forty percent in electricity compared to standard models. Fax machine models with the lowest available power level in “sleep” mode will save energy, since most fax machines are in standby mode most of the time.

Municipalities that are not in the market for new office equipment can still realize savings by using existing equipment wisely. All office equipment should be shut off at night and on weekends, when not in use. Shutting down computers at night—even those with a low-power sleep mode—will save energy and possibly extend the life of the computer. When

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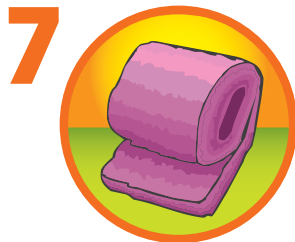
leaving the computer for a short amount of time, shutting off the monitor is a good idea since the monitor typically consumes about two-thirds of the energy used by the system. Screensavers were originally developed to prevent “burn-in,” but modern displays have largely eliminated the burn-in problem, so it’s a better option to just have the computer show a black screen, thereby saving energy.



Water Heating

A water leak is also an energy leak. Periodic maintenance on hot water systems can keep them operating efficiently. The burners of gas- or oil-fired hot-water heaters should also be tested annually.

Reducing the water temperature is another easy way to save. If hot water is needed for hand washing and other general uses, a setting of 120 degrees, or lower, is sufficient.



Building Insulation and Exterior

The outer envelope of a building is a critical factor in maintaining energy-efficiency because of the role it plays in regulating the indoor environment. While a newly constructed building is most efficient, there are ways to maintain the integrity of the building envelope for older designs as well. Focusing on doors and windows is a good first step. Make sure that they close tightly and inspect them for any leaks.

Added insulation in municipal buildings is beneficial in both summer and winter. For new buildings, adding more

insulation can be done for a relatively low cost premium. With retrofits, focus on roofs and attics because of the ease and lower cost to adding insulation there.

Exterior landscaping can both beautify a property and reduce energy costs. Deciduous trees on the south and west sides of a building, where the sun’s rays are most direct and intense, can provide energy-saving shade in the summer as well as solar warmth in the winter, when the trees have lost their leaves. Winter heating costs can also be reduced by planting evergreen trees or shrubs as windbreaks.



Vehicle Maintenance and Use

The cost of using municipal vehicles has gone up significantly, with gasoline prices hovering around \$3 per gallon. In the short-term, fuel can be conserved through driver habits and maintenance. Drivers should observe the speed limit and not drive aggressively. Gasoline selection should be the grade consistent with the owner’s manual. Keeping tires inflated and following service schedules are important to make sure vehicles are running efficiently. Longer-term, cities and towns can consider solutions such as selecting vehicles with better fuel economy or alternative fuels.



Electricity Use on Hottest Days

On August 2, 2006, the New England region hit a new record for electricity usage: 28,021 megawatts. In the midst of

the heat wave, consumers understood the importance of conservation to help prevent blackouts. Many ratepayers were not aware, however, that their usage on that day also affected their electricity bills for the 2007 “power year,” which runs from June 1, 2007, through May 31, 2008.

Each year, electricity users are “tagged” by their usage at the summer peak for the entire power grid. During last year’s heat wave, heavy use of air conditioning drove up electricity demand to its peak at 2 p.m. on August 2. For all electricity customers in New England, individual electricity usage during this hour was factored into an “installed capacity tag” used to assess future capacity charges for each electricity account.

Most cities and towns can make a significant dent in their energy costs by reducing electricity during the hour when the ICAP tag is determined. Municipalities that can be flexible with some energy reduction and would like more immediate benefits for scaling back may consider enrolling in a load response program. Customers that enroll in such a program, by scaling back electricity usage during grid emergencies, will offset ICAP charges through the receipt of year-round payments.



Buy-in

Getting the support of staff and building occupants is crucial to making progress in energy efficiency. One way to do this is through a successful first project. For example, a lighting upgrade—where everyone can see the benefits—may increase management and occupant enthusiasm for another efficiency project.

Another important step is training staff who will implement projects. Educating employees and even students will help them understand and accept new practices.

Moving toward energy efficiency is a community decision. A city or town can make a greater impact by developing support from residents and employees. ❁