

2014 Annual Report – Green Advisory Board
DRAFT, 31 December 2014

Since 2009, the Green Advisory Board (GAB), has investigated, explored, and prioritized energy efficiency improvements and renewable energy sources for Acton's municipal properties and our schools. We continue to make great progress in both the Town of Acton and the Acton-Boxborough Regional School District – this year we saw a 13.3% reduction in overall energy use from our baseline in FY2009. The most recent round of energy efficiency projects are described below.

MUNICIPAL

Lighting

-LED Streetlight Project: The Municipal Properties Department, working with Wellesley Municipal Light Plant (our streetlight vendor) and aided by a \$4,125 grant from NSTAR, converted fifty-six high pressure sodium streetlights located on Great Road to Light Emitting Diode (LED) lights. This project will save 15,246 kWh of electricity per year and reduce long-term outages and maintenance costs. The success of this project shows that converting the 300+ 100-watt metal halide streetlights currently located on other arterial and collector roadways to 51-watt LED lights is a viable project. Funding for this next phase will come from the Acton Energy Efficiency Fund.

- Memorial Library Lighting Controls Project: Occupancy and photo sensors are currently being installed throughout the library, which will allow lights to dim when they are not needed by library patrons; we anticipate this technology saving nearly 40,000 kWh of electricity each year. The project was funded by the \$37,511 from a state Dept. of Energy Resources (DOER) grant and \$9,847 in incentive money from NSTAR.

Solar

- Landfill Solar Array: Construction of the 1.6 megawatt solar array on the retired landfill was completed in December of 2013. The site came online in January 2014 and so far has generated over 1,800,000 kWh of energy for municipal buildings. Excess electricity produced during summer months is banked with NSTAR and credited to us during the darker winter months.

- Energy Efficiency Fund: In addition to providing renewable energy at a fixed cost for 20 years, the Landfill Solar Array provides payments to the Town of approximately \$60,000 per year. These payments have been deposited into the Acton Energy Efficiency Fund (created in 2012 through Town Meeting and Legislature approval). This fund will provide a self-sustaining source of funding for energy projects. Money from grants and incentive payments can also be deposited into the fund.

Vehicle Fuel Use

As new vehicles are needed, the Town is modernizing its fleet to more fuel-efficient vehicles. The Police Department is replacing Ford Crown Victorias and Expeditions with more efficient and effective Ford Explorers. *[Insert additional information on inspectional vehicles here?]* We installed a new monitoring system for our four Town fuel pumps at the DPW which allows

better tracking of fuel usage by individual vehicles in our fleet. This is key to identifying the least fuel-efficient vehicles that should be prioritized for replacement.

Behavioral Change Program

From March to August 2014, employees in five Town buildings (Red House, Cemetery Buildings, Citizen's Library, Public Safety and Town Hall) were encouraged to reduce their energy use at their personal workspaces. Educational materials encouraged energy reduction through computer sleep settings, refrigerator use in employee break rooms, A/C alternatives in Town offices and vehicles, LED light-bars on Town work trucks, and light bulb selection, among others. Energy consumption was tallied at the five buildings, and prizes were given to teams that used the least amount of energy compared to their building's usage in the same months last year. By pairing simple building/mechanical modifications with meaningful behavioral changes by employees, a 25%-30% reduction in electricity usage was realized in some town buildings during the five-month challenge period.

SCHOOL DISTRICT

Lighting and Mechanical

- A major energy efficiency upgrade was implemented at ABRHS in 2013-2014, with motion-sensor lighting in both gyms, hallway lighting that is three times more efficient, and a wide range of HVAC improvements. Utility incentives funded more than half of the \$300,000 project, resulting in a payback of less than two years through reduced electricity and natural gas bills (anticipated savings of 410,000 kWh and 38,000 therms annually).

- The District was awarded \$286,000 in DOER grant funding and utility incentives in June 2014 for four additional energy efficiency projects (completed or currently underway):

- New high-efficiency condensing boilers at RJ Grey JHS (\$147,635; anticipated savings of 12,923 therms annually)
- LED exterior lighting at Conant, Gates and Douglas to replace older, inefficient fixtures (\$57,228; anticipated savings of 67,452 kWh annually)
- Exhaust fans tied to building management software at RJ Grey JHS (\$42,073; anticipated savings of 11,383 kWh and 8,423 therms annually)
- Granular energy data captured at the ABRHS and JHS to achieve smarter energy management (\$54,613; anticipated savings of 144,734 kWh and 8,466 therms annually)

Solar and Renewables

The three PV solar arrays on school roofs (280 kW total on the ABRHS, JHS, Douglas ES) generated 312,000 kWh of electricity in FY2014. The District recently received a \$12,500 Technical Assistance grant from DOER to explore additional solar capacity to further reduce energy costs and emissions. The District has begun to purchase 20% of its electricity as certified from renewable sources as part of its current three-year supplier contract.

Vehicle Fuel Use

The District school buses continue to be fueled with ultra-low sulfur diesel (reducing particulate and nitrogen oxide emissions), and the bus fleet is equipped with clean Selective Catalytic Reduction technology (further reducing emissions). The successful "no idling" policy for vehicles

on campus is in its second year, and buses are equipped with a shut-off mechanism that enforces no idling beyond 5 minutes.

Engagement and Excellence

The District's strong success in energy efficiency (28% reduction in electricity use across the district over the last 5 years) is due to engagement by staff, faculty and students in energy conservation, cutting costs and greening school footprints. Students are encouraged to promote energy conservation, including working with committed faculty advisors on student Green Teams. Several of our schools received national and state awards for excellence in energy conservation and education from the National Energy Education Development Project (NEED) in the spring of 2014, including a trip for 10 participants to the national award ceremony in Washington, DC.

MUNICIPAL AND SCHOOL DISTRICT

Resiliency Grants

Both the Town and the District received state Technical Assistance grants to explore "resiliency" measures that would provide a stable energy supply for critical facilities (e.g., emergency dispatch, overnight shelters), if the grid is down due to a storm or other event, by charging large battery banks through daily solar generation. The measures proposed were judged by both the District and the Town to not be feasible at this time due to high capital costs and ongoing maintenance costs. The data will be reviewed again as costs shift and the technology becomes more affordable.

Green Communities Grants

For the purposes of the Department of Energy Resources (DOER), Green Communities Grant Program (GCG). The School District is considered to be a subset of the Town of Acton. All Green Communities grants are applied for and administered by the Town. In 2014 the Town applied for and administered \$234,500 in grant funds. 84% of the funding went to School projects and 16% to Town projects as noted earlier in this report.

We look forward to continuing to build on this work in the coming year.

GAB Members:

Bruce Friedman, Chair

Eric Hudson, Vice-Chair

Dennis Loria

Mary Smith

Padmaja Kuchimanchi - Associate

Renato Nakagomi – Associate

Peter Berry, Selectman Liaison

Dean Charter, Director of Municipal Properties

Andrea Ristine, Office Manager, Municipal Properties

Pamela Cady, Energy Conservation Analyst, Town of Acton

Kate Crosby, Energy Manager, Acton-Boxborough Regional School District