

# Holliston Energy Committee Annual Report

July 2009

# Executive Summary

- Reduce energy use by 15% and obtain 10% of energy use from renewable sources by 2015
- Take additional immediate steps to conserve energy
- Explore renewable energy options
- Exploring ideas to make Holliston greener
- Use performance contracting to implement strategy

# Roadmap

Holliston  
Energy  
Committee

- Charter & Organization
- Vision
- What Can We Learn from Our Neighbors
- Sources of Savings
  - How Do We Make It Happen
- Renewable Energy
- Making Holliston Greener
- Holding Ourselves Accountable

# Roadmap

Holliston  
Energy  
Committee

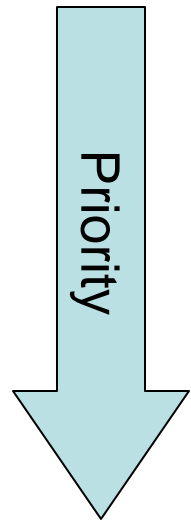
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# Charter & Approach

1. Identify ideas to reduce energy consumption by and spending for Town facilities
2. Identify renewable energy resources that can be used by the Town
3. Determine Town role in helping residents become “greener”

To the extent that the ideas require funding, the committee should identify relevant funding sources.

1. Staged, sustained effort over time
2. Several sub-committees to analyze information and make recommendations
3. Ongoing collaboration between Committee and other town and school efforts important
4. Short-term and medium-term recommendations
5. Cognizant of current economic conditions and need to maximize leverage of any recommended town spending



# Subcommittee Organization

Subcommittees	Members (Chair)
Baseline: Develop baseline of Town energy utilization and spending, including school facilities	(Suzanne Newark), <b>Parashar Patel</b> , Chris Smith
Energy Generation: Identify ideas for renewable energy generation	<b>John Baudreau</b> , Dana Harris, Suzanne O'Brien, John Roth, (Maura Snow)
Green: Identify opportunities for Town residents to become "greener" through energy conservation and use of alternative energy sources	John Baudreau, <b>John Varga</b>
Grants: Identify grants and other funding sources for Energy Committee ideas	<b>Ginny Murphy</b> , John Varga, (Maura Snow)
Outreach to Other Towns: Identify efforts made by other Towns	John Roth, <b>Chris Smith</b>

(No Longer Serving on Energy Committee)

July 1, 2009 Final

# Roadmap

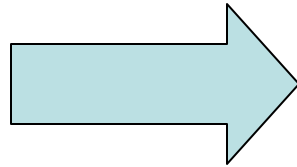
Holliston  
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# Recommended Vision

Holliston will use 15% less energy by 2015 and 10% of the energy used will be from renewable sources.

- **C**onserve
- **R**enew
- **E**ducate
- **S**ustain
- **T**ogether



- Reduce use by 15% compared to 2009
- 10% of use from solar and other renewable sources

Goals to be finalized upon completion of baseline audit.

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# Municipal Outreach Survey: Method

- Selected twenty towns based on:
  - Contacts
  - Geographically close to Holliston
  - Reputation for “best practices”
- Areas of focus:
  - what organizations and programs other towns were affiliated with to assist in energy efficiency, conservation and “green” initiatives;
  - each town’s no-cost or low-cost practices in these areas;
  - towns with environmentally friendly procurement programs;
  - renewable energy generation initiatives;
  - grant sources;
  - performance contracting;
- Written survey with follow-up interview with three towns that responded to survey

# Municipal Outreach Survey: Observations

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- Environmental Coordinator to coordinate and develop programs
- Involvement in Environmental- and Energy-related Organizations and Programs
  - Many organizations and programs at the state, federal and international level
- No- or Low-Cost Energy/"Green" Practices
  - Energy (lighting, occupancy/thermostat sensors, employee education, etc)
  - Waste Reduction (double sided printing, use of digital media rather than paper, etc)
  - Pollution ("no idling policy")
- Renewable energy projects
  - All investigating small energy projects (largely solar)
  - One town beginning a "large" wind project
- Program for Going "Green"
  - All respondents have programs to promote "green" practices to its citizens.
  - Outreach activities include an energy efficiency checklist and brochure, newsletters, programs (i.e., Sustainable Milton, Carbon Café and Earth Day programs in Dedham).
- Performance Contracting
  - Two respondents investigating the use of performance contracting to implement energy conservation solutions.
  - One respondent ready to put a contract out to bid.

# Municipal Outreach Survey: Subcommittee Recommendations

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- Short Term (within one year)
  - Begin work framing holistic “Town Energy Plan” to achieve “vision” of energy reduction and source. (We will consider this report as the 1st draft of plan.)
  - Identify resource to coordinate energy/environmental activities.
  - Develop list of current energy/environmental initiatives and programs currently in place. Document related policies and procedures.
  - Explore membership in organizations such as ICLEI, MCAN, etc. to identify tools, funding sources, and other services provided.
  - Develop Town policy on additional energy and environmental no-cost activities. Develop outreach programs for town employees on such activities.
- Medium Term (one - three years)
  - Begin a systematic program of energy audits of Town facilities. Inventory audit findings and begin a prioritized list of programs. Map programs with list of available grants. Provide enough lead time for approval processes, etc.
  - Investigate developing a “shared” Environmental Coordinator position with adjacent towns.

# Roadmap

Holliston  
Energy  
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- What Can We Learn from Our Neighbors
- **Sources of Savings**
  - Bill Analysis, Demand Response, Behavioral Changes
  - How Do We Make It Happen
- Renewable Energy
- Making Holliston Greener
- Holding Ourselves Accountable

# Sources of Potential Savings: Bill Analysis

- Establish baseline utilization and spending levels
- Audit energy bills to confirm town receives municipal rates
- Two approaches:
  - Fixed price consultant: pay a fee
    - Advantage: potentially greater net savings to town than shared savings approach
    - Disadvantage: requires initial spending
  - Shared savings consultant: share potential savings
    - Advantage: requires no initial spending
    - Disadvantage: consultant likely to take greater share of savings, reducing net savings to town

**Recommendation: Use performance contractor to develop baseline**

# Sources of Potential Savings: Demand Response

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- Programs pay users to reduce energy use during peak demand times
  - No need for consultant; [check on availability of free consultants]
  - Requires identification of facilities
  - Requires contact person to reduce energy during peak times
  - No cost to town

**Recommendation: Town explores enrollment of town buildings & schools**

# Sources of Potential Savings: Behavioral Based

1. Alter settings of heating and cooling systems (save 1 to 3% of cooling or heating costs for each degree the thermostat is raised or lowered)
2. During the winter, set the thermostat to 68° F when the work place is occupied and 65°F after business hours. During the summer, set the thermostat to 76°F when the workplace is occupied, and 80° F after business hours.
3. Power-down all desktop computers (if you cannot – turn off monitor and printer)
4. Install free software from the Environmental Protection Agency that puts monitors in sleep mode when not in use. This can save \$0.085/kWh of power used by networks.
5. Adjust workplace schedules to reduce energy use during the hours when there is most demand for electricity. If employees start work earlier or have lunch during the hottest hour of the day, a company can save on air conditioning, lighting and other electricity use during the hours of peak electricity demand.
6. Use electronic communication rather than paper based methods
7. Disconnect unnecessary equipment
8. Open blinds or shades for natural light
9. Employee Education Newsletters regarding energy efficiency/conservation
10. Energy Star Procurement Policy

**Recommendation: Build on good progress to date by continuously expanding actions across town departments**

# Behavior-based Actions: Current Town\* Practices Matrix

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Recommendation	Library	Town Hall	Senior Center	Schools	Fire Department	Highway Department
Alter settings of heating and cooling systems	N/R^	Yes	No	Yes	Yes	Yes
Winter settings 68/65F Summer settings 76/80F (business hours/after hours)	N/R 70	68/62 Will be 76/80 starting July	68/68 Summers?	68/	N/R	N/R
Power-down all computers (or turn off monitor and printer)	Yes	Yes	Yes	Yes	Yes	Yes
Put monitors to sleep using free EPA software	N/R	Will pursue	No	Will pursue	No	No
Adjust workplace schedules to reduce energy use during peak electricity demand hours	N/R	Summers for now; revisit rest of year later	No	Not possible	No	No
Use electronic communication rather than paper	Yes	Yes	Yes	Yes	Yes	Yes
Disconnect unnecessary equipment	Yes	Yes	No	Needs improvement	No	No
Open blinds or shades for natural light	Yes	Yes on 1st floor	Yes	Yes, where possible	Yes	Yes
Educate employees regarding energy efficiency/conservation	N/R	Not yet	No	2x/year	No	No
Energy Star Procurement Policy	N/R	Not yet	No	Yes?	No	No

\*Based on town facilities reporting as of June 30, 2009

^ No Response

# Making It Happen: Two Approaches

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- Performance Contracting
- Do-it-Yourself

# How Do We Make It Happen: Performance Contracting

- Installation and management of energy efficient facility improvements, with **no** up front cost, paid for out of **guaranteed** energy savings from your **existing** operating budget.
- Enabled by M.G.L. Ch. 25A, Sect. 11I
- Allows for streamlined RFQ process leading to long-term contract with an energy services company (ESCO) that provides a custom program of energy savings and capital improvements:
  - RFQ developed with guidance from statute and put out to bid
  - Vendors submit responses
  - Interviews are performed
  - Evaluation committee selects vendor
  - Technical energy audit begins
  - Vendor submits final proposal
  - Project approved by selectmen
  - Installation begins
- ESCO responsible for financial and operational outcomes; **MUST** measure, verify and guarantee results and savings
- Financing via tax exempt municipal lease or funded from operating budget – typically no bond issuance required

# Performance Contracting: Experience from Our Neighbors

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- Bellingham:
  - 7 buildings, 365,000 sq feet
  - \$598,000 10 year term, started 12/1997 with all tasks completed on schedule
- Quincy:
  - 38 buildings, 2.5 million sq feet
  - \$30.5 million, project started 5/2007 with installation currently running on schedule
  - 20 year municipal lease purchases

# How Do We Make It Happen: Do-it-Yourself

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- Town employees identify sources of savings
- Town employees either implement projects and/or manage multiple contractors
- Town must finance purchase of equipment, supplies, and contracts

# Making it Happen: Pros and Cons

- Two approaches
  - Performance contracting
    - + dedicated resource
    - + incentive to complete job
    - + Timeliness of delivery
    - + Guaranteed energy savings
    - + Flexible financing approaches available
    - + Scope of work can be scaled
    - Must be properly structured
    - Share savings to pay for performance
  - Do-it-yourself
    - + Town keeps all savings
    - + Scope of work can be scaled
    - No dedicated resource available
    - Must manage multiple contractual relationships
    - Could take long time
    - Labor and other costs may be more costly than using outside consultants
    - May not be able to leverage expertise from others' experience

**Recommendation: Use performance contracting**

# Performance Contracting: Next Steps

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- Solicit formal presentations from ESCO candidates (e.g., Honeywell, Johnson Controls, Ameresco to name a few)
- With baseline analysis as guide, develop RFQ and distribute
- Rank responses, select energy services provider, and develop a contract to proceed.
- Timeline of 8 to 10 weeks from issuance of RFQ to selection of ESCO provider.

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# Renewable Energy: Two Approaches

## Do Not pursue a Renewable Energy Policy

### Advantages

- Leaves options open
- Lowest Risk
- Simplest, does not complicate the Town's energy policy

### Disadvantages

- Does not alleviate any energy cost burden
- Does not contribute to a Greener Society

## Pursue a Renewable Energy Policy

### Advantages

- Provides Cost Savings
- Provides a partial hedge against price volatility
- Reduces the Town's Carbon Footprint
- Provides an inspirational example for Town citizens and other communities
- Can be done with no investment by the Town

### Disadvantages

- Will require resources, people's time and effort
- Could cost money
- Represents a long term commitment to that energy source

**Recommendation: Pursue a renewable energy policy**

# Renewable Energy

## Building or Group Implementation

### Advantages

- Minimal and incremental commitment
- Less complex business arrangement

### Disadvantages

- Many different projects
- Disruptive
- Visual and Structural impact on existing buildings
- No economies of scale = minimal savings

## Centralized Solar “Farm” for Town

### Advantages

- Single project
- Single maintenance
- No impact on existing structures
- Improved economies of scale
- Minimal visual impact

### Disadvantages

- Requires land
- More complex business arrangement with partner
- Represents a long term commitment to that energy source

## Recommendations:

1. Begin installation of solar panels on Town Hall, High School, and other applicable town buildings
2. Evaluate feasibility of centralized approach on town property

# Renewable Energy: How to Make It Happen

## Utilize a Power Purchase Agreement (PPA) Strategy

### Advantages

- No up front costs
- Long term negotiated energy costs
- Maintenance is contracted

### Disadvantages

- Not owned by Town
- A long term contract
- Higher than Town-owned as some of the energy revenue is used to pay off investors

## Build and Own. Net Metering into Grid

### Advantages

- Provides Greatest Cost Savings
- Provides a greater hedge against price volatility
- Can sell excess power back into the grid

### Disadvantages

- Highest Risk
- Highest up front cost
- Represents a long term commitment to that energy source

**Recommendation: Issue an RFQ for a PPA if not part of performance contract**

# Grant Availability

- Assisted Town in securing participation in State's Energy Audit Program for various Town buildings
- Massachusetts Department of Energy Resources (DOER) Energy Efficiency and Conservation Block Grants (EECBG) of up to \$150,000 for renewable energy and conservation projects. Applications being accepted in mid-July for identified projects.

## Recommendations:

1. Identify a Selectman as "champion" for DOER EECBG
2. Select an individual responsible for coordinating Town's grant application
3. Determine relevant projects for funding

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# A Greener Holliston: Recommendations

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- Green Newsletter – Tips, Energy Facts
- Table at Celebrate Holliston
- Watt Meter for Checkout at Library
- Promote “Low Carbon Diet”
- Energy Saving Contests Between Town Departments & different Neighborhoods
- Involve HHS Environmental Club

**Recommendation: To be implemented by recommended environmental coordinator**

# Encouraging Greener Holliston: Through Zoning

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- Provided input on by-law on accessory structures
- Regulations for neighborhood net metering of the Green Communities Act are nearing completion. Municipalities may net meter up to 2Mw of photovoltaic (PV) generating capacity and receive the maximum financial benefit under these regulations. The output from a single PV facility could be allocated to various metered accounts of Town of Holliston.

**Recommendation:** Encourage development of centralized solar farms on private and/or public property, especially brownfield sites.

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- Recommendations
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# Recommendations

- Get the low hanging fruit
  - Frame holistic “town energy plan”
  - Immediately identify resource to coordinate energy/environmental activities
  - Develop list of current initiatives and policies
  - Explore membership in educational organizations
  - Develop town policy on additional town energy and environmental activities
  - Investigate sharing environmental coordinator with adjacent town(s)
- Explore enrollment of town buildings in demand response programs
- Expand behavioral-based actions across all town departments
- Use performance contracting to implement identified strategies
- Install solar panels...on town roofs first; explore farm for town property using power purchase agreement
- Help town residents become “greener”
- Explore permitting centralized solar farms on private property
- Track progress
  - Develop baseline audits & measure implementation progress
  - Subsequent slides are provided as dashboards for tracking purposes

# Progress Report: Conservation Ideas

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Recommendations	Status	Comments
Audit Town Facilities <ul style="list-style-type: none"> <li>- Town Hall</li> <li>- Library</li> <li>- Senior Center</li> <li>- Flagg School</li> <li>- Pumping stations</li> </ul>		Town accepted in State DOER Energy Audit Benchmark program. Awaiting start of program later in 2009. Application submitted for: <ul style="list-style-type: none"> <li>- Central Fire Station</li> <li>- Wastewater treatment facility</li> <li>- Water treatment facility</li> <li>- Highway</li> <li>- Town Hall</li> <li>- Senior Center</li> <li>- Library</li> </ul>
Audit remaining schools <ul style="list-style-type: none"> <li>- Miller</li> <li>- Placentino</li> <li>- Adams</li> </ul>		Town accepted in State DOER Energy Audit Benchmark program. Awaiting start of program later in 2009. Application submitted for: <ul style="list-style-type: none"> <li>- Miller</li> <li>- Placentino</li> <li>- Adams</li> </ul>
Implement Quick Savers <ul style="list-style-type: none"> <li>- Replace incandescent with fluorescent</li> <li>- Install programmable thermostats</li> <li>- Install occupancy sensors</li> </ul>		
Review operations of street lights		
Control energy use of computer monitors and hard drives		

# Behavior-based Actions: Current Town Practices

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Recommendation	Town Hall	Senior Center	Schools	Fire Department	Highway Department		
Alter settings of heating and cooling systems	Yes	No	Yes	Yes	Yes		
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Disconnect unnecessary equipment	Yes	No	Needs improvement	No	No		
Open blinds or shades for natural light	Yes on 1st floor	Yes	Yes, where possible	Yes	Yes		
Educate employees regarding energy efficiency/conservation	Not yet	No	2x/year	No	No		
Energy Star Procurement Policy	Not yet	No	Yes?	No	No		

# Progress Report: Other Savings Ideas

Holliston  
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<b>Recommendations</b>	<b>Status</b>	<b>Comments</b>
Bill Analysis		
Demand Response		

# Progress Report: Grants

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Recommendations	Status	Comments

# Progress Report: Renewable Energy

Holliston  
Energy  
Committee

Recommendations	Status	Comments

# 2006 HHS Audit Status:

**7% reduction in utilization compared to 2008 by February 2009**

Recommendation	Cost	\$ Savings/yr (06\$)	Simple Payback (yrs)	Status
Control use of PC monitors and hard drives		26.0K	0.0 - 0.25	Ongoing
Install vending machine and/or cooler controls		4.2K	1.0 - 1.5	Completed Sept-01-08
Variable speed motors		\$23.2K	1.0 - 4.0	Completed Dec-31-08
Occupancy sensors for lights		\$15.6K	1.0 - 4.0	Completed Dec-31-08
Retrofit metal halide to high intensity fluorescent (field house & cafeteria)		\$12.9	2.0 - 4.0	Completed Field House Sept-15-08
Retrofit incandescent lighting		4.2K	0.5 - 5.0	Not completed yet
ECM motors & fan controls in walk-in coolers		1.0K	4.0 - 5.0	Completed Dec-31-08
Demand controlled ventilation				Need to check status
Install efficient cafeteria lighting (not in 06 audit)				12/31/08 expected completion

Key: Not Started Ongoing Completed