



# SOLAR ON SCHOOLS

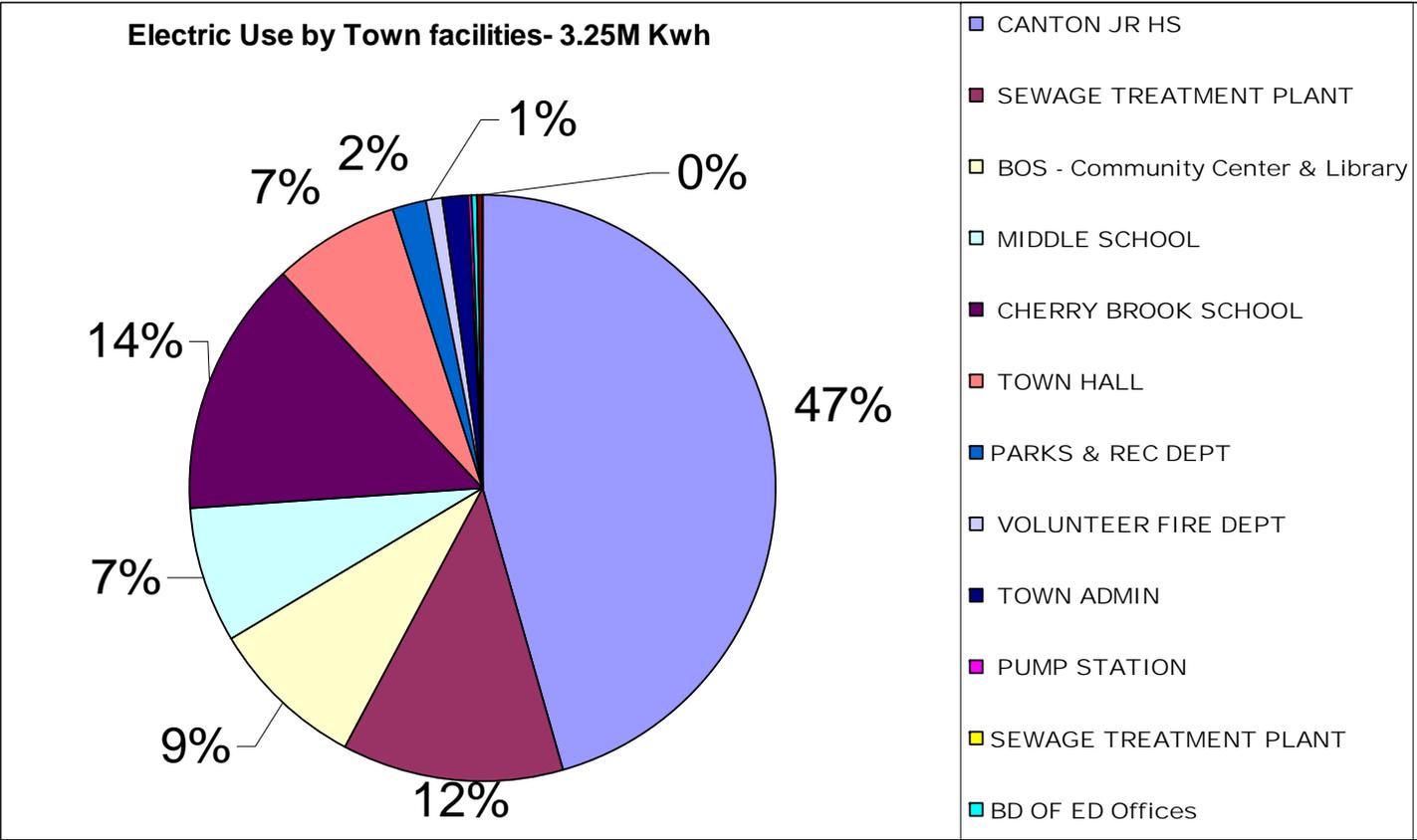
Presentation for  
Canton Board of Selectmen

By:

Canton Temporary Energy Task Force

December 19, 2007

# Canton's Electricity Consumption



2005 town electric use (references fact Base 2)

Facility	Kwh	Annual Cost	CLEAN or CONSERVED TARGET *
			20% of Kwh
CANTON JR HS	1,483,200	\$ 159,256	296,640
SEWAGE TREATMENT PLANT	394,880	\$ 42,250	78,976
BOS - Community Center & Library	284,320	\$ 38,716	56,864
MIDDLE SCHOOL	237,120	\$ 31,333	47,424
CHERRY BROOK SCHOOL	464,493	\$ 56,081	92,899
TOWN HALL	226,080	\$ 29,248	45,216
PARKS & REC DEPT	57,240	\$ 8,324	11,448
VOLUNTEER FIRE DEPT	34,658	\$ 5,403	6,932
TOWN ADMIN	37,472	\$ 5,090	7,494
PUMP STATION	9,040	\$ 1,270	1,808
SEWAGE TREATMENT PLANT	6,876	\$ 1,058	1,375
BD OF ED Offices	6,514	\$ 1,356	1,303
ON GAZEBO-USED FOR MUSIC	3,208	\$ 626	642
TOWN ADMIN	4,341	\$ 797	868
VOL FIRE DEPT FAIRGROUNDS REDSHE	721	\$ 354	144
BODEN FIELD SCOREBOARD	217	\$ 296	43
<b>TOTAL</b>	<b>3,250,380</b>		<b>650,076</b>

\* Not projected



# The Solution to Reduce Costs

A photo voltaic (PV) solar array system installed on the High School / Middle School in conjunction with the upcoming roof replacement project.



# SOLAR ELECTRIC POWER FOR CANTON SCHOOLS

## **Will solar power work for Canton schools?**

Any south or near south-facing roof that is free from shade from 9AM to 3PM is a desirable site. Panels installed on flat roofs will be oriented for optimum energy production. A relatively new underlying roof is desirable so that the system would not need to be removed for roof repairs at a future date. Most PV systems are designed for a 25 year lifetime.



# SOLAR ELECTRIC POWER FOR CANTON SCHOOLS

## **Can Canton afford to install a solar electric system?**

The outright purchase of a solar electric system for a school can cost over \$300,000 after federal and state reimbursements.

However, municipalities can purchase solar electricity with no up front or capital costs by entering into a Power Purchase Agreement.

# SOLAR ELECTRIC POWER FOR CANTON SCHOOLS

## **How does a Power Purchase Agreement (PPA) Work?**

With a PPA a third party business or investor owns the solar system and sells the power produced by the system to the municipality for a set period, typically 15-20 years. Depending on the size of the system, the power purchase rate is typically ten percent less than current CL&P rates and escalates by a set percentage per year. At the end of the PPA, the municipality has the option to purchase the system at a depreciated value, renew the PPA, or have the system removed.



# SOLAR ELECTRIC POWER FOR CANTON SCHOOLS

## **Does the system require servicing?**

All servicing, inspections, and other maintenance is performed by the installing company.



# SOLAR ELECTRIC POWER FOR CANTON SCHOOLS

**What percentage of the school's power can solar contribute?**

The answer to this question is dependent on the size of the array and the level of electrical use of the school. However, a 100kw system will typically produce 20-30 percent of a school's overall usage.



# SOLAR ELECTRIC POWER FOR CANTON SCHOOLS

**How much electricity will a PV system produce?**

A 100Kw system will produce approximately 113,000 kilowatt hours of AC electricity per year.

# SOLAR ELECTRIC POWER FOR CANTON SCHOOLS

## **What are the benefits of using solar electric power?**

- » Reduced Electric Bills/Hedge Against Future Utility Increases
- » Reduce Peak Demand
- » No Emissions
- » Educational opportunities
- » Energy Independence
- » Energy Leadership
- » Increased roof life in PV array areas
- » Reduced cooling load (and costs) in PV area

## Why Solar on Schools?

- » Affordable Clean Energy for Schools
- » Leadership against Global Warming for Students, Faculty, Alumni and Parents to Observe
- » Classroom integration as teaching tool
- » “Monetizes” tax and ownership benefits for the school that would otherwise be unavailable
- » Turn-Key solution for School. Campus energy provided just as before

# What is Solar on Schools?

- » A program that combines technology, and financing to lower schools' operating energy costs
- » An on-site Solar array producing significant electrical power for school
  - » Clean renewable energy
  - » Discount to utility provided power
- » An Energy and Weather monitoring system
  - » Real time energy and weather data
  - » Integrated into school data network for classroom access
- » Class curriculum available through other school renewable energy programs

# Solar Works Inc. a National Leader

- »» Solar Works Inc. has been a leading developer nationally of solar energy on schools.
  - »» Over 100 schools installed across 8 States
  - »» Solar Power...Naturally in New York State
  - »» Largest Ed system in N.E. – Barnard Environmental Magnet School
  - »» Leading universities – UVM, UNH, U of Hartford
- »» Historically school solar installations provided limited power and linked to the classroom for data display
  - »» Current energy cost increases along with tax incentives to solar provide an opportunity for renewable solar energy to address school power and educational needs



# Solar Energy Services Agreement

- » Method to gain benefits of solar electricity without up-front capital cost.
  - » Stabilize a portion of electric costs as a hedge against utility increases
  - » Fixed escalation of electric rates over term
  - » Environmental & public relations benefits from clean energy
  - » Solar Works responsible for system operations, maintenance and administration.

# Solar Energy Service Agreement

- » Project Sizes 50kW, 100kW and 200kW
- » Services agreement 15 year term
- » Third-party investor owns solar array
- » Customer agrees to purchase 100% of power at contract rate on a per kilowatt hour basis
- » Solar Works responsible for system operation & maintenance
- » Investor provides billing and administration.
- » Customer provides physical access to array location

# Solar Energy Service Agreement

## »» End of Contract Options:

- »» School may purchase for fair market value
- »» School may extend contract in 5 year increments
- »» School may terminate agreement and system will be removed at no cost.

# Three-Way Services Agreement

## 3rd Party Investor

- Capital Investment
- Tax & Depreciation Benefits
- Monthly Power Revenue
- Administration/Billing

## Solar Works Inc

- System Design
- System Installation
- Maintenance
- Monitoring

## School

- 100% Power Purchase through Energy Services Agreement
- Solar Energy Curriculum Network
- Roof Access
- End of Term Buyout



## Benefits of Energy Service Agreement

- » Immediate savings versus current utility rate
- » End of contract options
- » Educational benefit of solar system

# Display Types

- » Touch Screen Kiosk
- » Scrolling Screens  
(Slide Shows With  
Live Data)
- » Custom
- » Computer over LAN
- » Computer via Internet



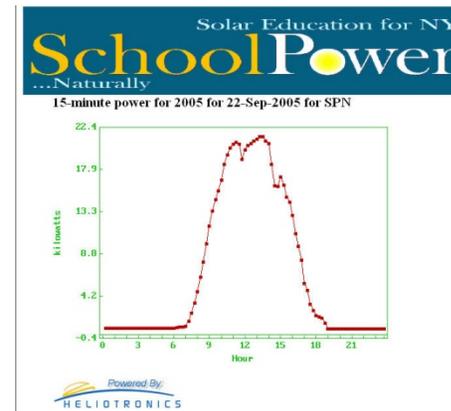
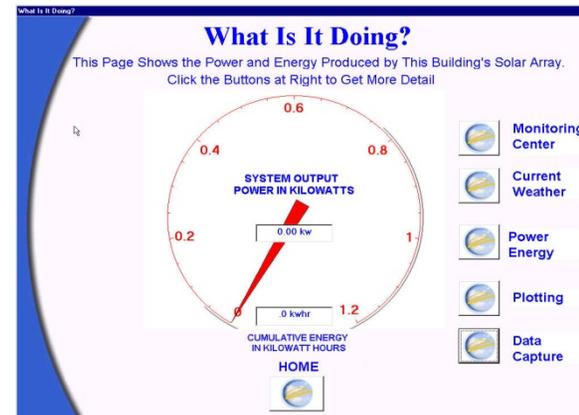
# Computer and Web Based

## » Local Software and LAN

- » Real Time
- » Own Data
- » Kiosks, Custom Displays

## » Internet Based

- » Broad Reach
- » Branding



# Cape Cod Community College



# MIT Student Center





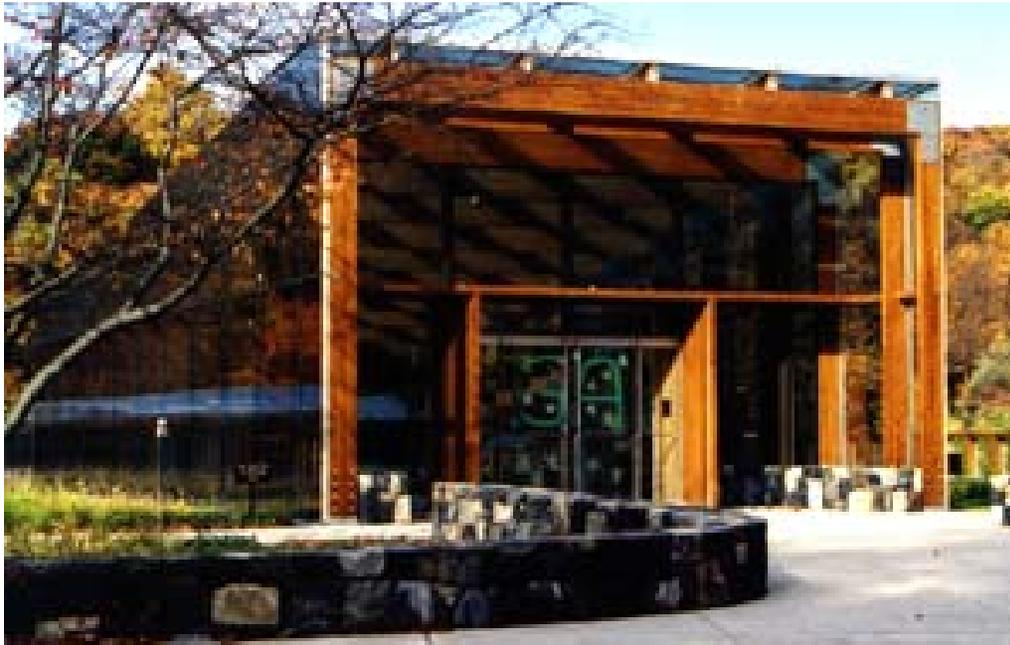
# Barnard Environmental Magnet School - New Haven



“The fact that New Haven is putting up these solar panels means that they value energy independence and they value mitigating the effects of climate change. I hope that every city and town across the state can follow New Haven's lead.”

Jonathan Edwards,  
CEO, Smart Power,  
Subsidiary of  
Connecticut Clean  
Energy Fund

# Greenwich Academy



27.7 kW flat  
roof system,  
designed as  
part of the  
new Middle  
School  
building.

# University of Vermont



“Solar Works did an expert job of installing the University's solar array. We also appreciate their collaboration with our staff and students on the educational aspects of the project. Check it out at <http://www.uvm.edu/solar>”

Gioia Thompson,  
Environmental  
Coordinator, University of  
Vermont

# Solar on Schools

## Energy Task Force ranks municipal energy usage

By Glenn Shafer  
Staff Writer

CANTON - The Canton Energy Task Force, a new committee established by the Board of Selectmen, is promoting the use of clean and renewable energy in town. Chaired by town resident Patrick Delany, the Energy Task Force got under way at the start of 2007 and has completed a number of comprehensive initiatives.

Using meter data from CL&P, the Energy Task Force has completed a report ranking all the municipal and school buildings in how much energy they consume. "We analyzed all the towns meters," said Delany. "We wanted to conclude how much electricity the town consumes."

The most expensive building in town is Canton High School/Junior High School. According to Delany, the ranking can be used for a variety of purposes including the prioritization of renovation projects to include installing solar panels. The report could also be useful in attempts to conserve energy and to choose clean energy alternatives.

Delany said Canton is not using clean renewable energy for their school build-

ings despite committing to the "20 by 2010" program, a national program where towns use 20 percent clean renewable energy. On Dec. 18, the Energy Task Force will meet with the Board of Selectmen to make their case for why the time has come for the town to commit to clean renewable energy.

The Energy Task Force is also attempting to raise the awareness in town as to the importance of clean renewable energy and to convince town residents to switch their usage. Delany said residents can opt for clean renewable energy for electricity on their CL&P bill or by visiting [www.ctinnovations.com/communities/Canton.php](http://www.ctinnovations.com/communities/Canton.php). During Sam Collins Day, the Energy Task Force set up a booth and signed up 15 more residents for clean renewable energy usage, bringing the town total number of towns residents up to 150 residents. Delany said the two clean renewable energy companies available to Canton residents are Community Energy and Sterling Planet. He said the Energy Task Force is recommending Sterling Planet to Canton residents since they utilize local clean renewable energy suppliers.

Continued on page 13

## SANTA SPOTTED IN HARWINTON



Journal

Special guest Santa Claus hands out treats to youngsters gathered on the Sunday's annual tree-lighting ceremony.

By Kevin D. Roberts  
Special to the Post

HARWINTON — A renewed town tradition continued into its third season Sunday evening with the lighting of the tree on the town green.

The tradition continues despite the disbanding of the Harwinton Business Association, which helped put on the event. Some members of the organization decided that they

wanted to keep the tree lighting going. As was the case last year, the Farmington Valley Choir provided the entertainment with several Christmas carols. Santa Claus also made an appearance.

"I think this is great," Kristen Ebner-Martin, Farmington Valley Choir member and resident, said after the event.

Ebner-Martin said during the ceremony that she went to school at Harwinton Consolidated and Lewis

## Truck safety chief among three regional state gra

Lisa Backus  
Journal Register News Service

NEWINGTON — Since Gov. M. Jodi

and police in nearly two dozen area agencies, have been working to shape three grant proposals for the Dec. 3 submission deadline.

to craft projects that would include multiple towns, using shared resources at a cost savings and benefit to all.

When Mulhall and the Capitol Region grant

### Canton fire, EMS holds Be Safe, Replace campaign

By Glenn Shafer  
Staff Writer



**Tom and John Gotaski, replace a nonworking smoke alarm with a new smoke/CO detector for Mrs. Olson.**

The Canton Volunteer Fire & EMS Department held its annual Be Safe and Replace campaign this month. Many residents have dead batteries in their smoke detectors or no carbon monoxide detector.

According to Sylvia Caccela, a volunteer firefighter in Canton, over 50 new smoke/CO alarms and 100 fresh batteries were distributed for free this month to Canton residents. Smoke detector tests were conducted by the Department volunteers and suggestions were given for optimum placement. "Nearly half the homes we visited had already taken the preventive measure of replacing the batteries in their smoke or CO alarms," said First Fire

Lieutenant Matt Majher. "Some residents even helped us out by recommending specific neighbors who may need assistance with their alarms."

Residents were surprised to see the fire trucks pull onto local streets. "We've always appreciated all the services that have been and continue to be rendered by the fire and ambulance volunteers," said Canton resident Roy Olson.

Anyone interested in becoming a member of the Volunteer Fire & EMS Department can visit [www.cantonfireandems.org](http://www.cantonfireandems.org)

or drop by the Canton, Collinsville or North Canton firehouse on Monday evenings during the department's weekly practice drill at 7:30 p.m.

### Harwinton hosts tree li

Continued from page 1

One, while the Connecticut State Police and Harwinton Fire Police combined to keep traffic running smoothly while South Road was closed off. Former association past president Carole Romano read something she wrote about the tree lighting called "A Christmas in

a Small Town," which said neighbors are friends.

"May you all have a happy holiday and a prosperous New Year," said First Selectman Chiaramonte said.

Several birds within the town Christmas tree even joined in

### Energy Task Force ranks municipal energy usage

Continued from page 1

The Energy Task Force has also researched the status of two local dams, one in Canton and one in Burlington. The Energy Task Force is attempting to assist in the regulatory hurdles of revamping the dams and powerhouses to capture the energy of the Farmington River. Delany said years ago, Canton had an option to buy the energy rights to those two dams, energy sites that could potentially supply enough electricity for 1,500 houses.

Delany said simple acts of energy conservation can make a difference, too.

"Six compact fluorescents can reduce your consumption," said Delany. "Check out the local light bulb store in Collinsville, they have 200 different types of light bulbs." Delany said the Energy Task Force wants the town to install a special recycling bin at the transfer station for the new energy efficient light bulbs since the new bulbs contain mercury.

As the town and individual residents switch over to clean renewable energy, the Connecticut Clean Energy Fund will purchase solar panels for municipal buildings. Delany said any new roofs on Canton buildings should be installed with solar panels

to both capture the energy of the sun and to absorb heat, in return, requiring less energy to cool the building. "The electricity from solar panels is a third part source and will not cost the town anything," said Delany. "It will reduce the burden on the grid."

With a \$5,000 grant from the Connecticut Clean Energy Fund, the Energy Task Force is actively promoting clean renewable energy awareness and education through grants to local citizens, businesses, civic organizations, and non-profits. Residents interested in joining the committee should call Delany at 693-2561.

**FALL SPECIAL**

**20% off**

- All Tree Work
- Tree Removal
- Pruning...etc.

**Pinnacle Rock Farms Tree Care**

- Lic. Arborist
- Fully Insured
- Free Estimates

**(860) 770-4486**

B-2357

**SATURDAY**  
DECEMBER 8  
10 AM-2 PM

OUR COMPANION  
**HOME FOR**

Dozens of adoptable animals  
Photo

**Our Colors**  
CANTONVILLE



**ONLINE Gift**

Can't find it?  
Go online with us  
in-store