



**GREEN COMMUNITIES
GRANT PROGRAM
FY 10 APPLICATION**



GRANT APPLICATION

INSTRUCTIONS

- 1, Applicants must complete all required sections in ordered to be considered for a grant award.
2. Applications will be accepted beginning Friday, March 19, 2010 and must be submitted by **Friday, May 28, 2010 at 5:00pm**. One electronic copy must be submitted to Cliff Sullivan at: cliff.sullivan@state.ma.us and one unbound hardcopy must be submitted to the following address:

Department of Energy Resources
Green Communities Division
100 Cambridge Street, 10th Floor
Boston, MA 02114
ATTN: Cliff Sullivan

3. Applicant must be a designated Green Community
4. Awards are capped at \$1,000,000
5. Regional applicants must complete the regional section of this application
6. Applicants must check off the applicable project boxes and complete all appendices

QUALIFIED PROJECTS

Designated Green Communities are eligible to submit a grant application to fund all or a portion of the costs of studying, designing, constructing and implementing energy efficiency activities, including but not limited to:

- Energy conservation measures and projects
 - Procurement of energy management services
 - Installation of energy management systems
 - Adoption of demand side reduction initiatives
 - Adoption of energy efficiency policies.
 - Financing the siting and construction of renewable and alternative energy projects on municipally-owned land.
-

DESIGNATION INFORMATION

Green Communities Designation Number: GC - 2010	Date of Designation: May, 2010
---	---------------------------------------

SCORING

Grant applications will be evaluated based on a number of factors including but not limited to:

Project viability (Appendix B, C)

- Project feasibility (site assessments, availability of resources - e.g. Wind speeds, permitting)
- Budget / Financing (including project budget, pay-back, funds leveraged, etc.)
- Fossil Fuel Energy reduced by funds spent

Projected Energy Impacts (Appendix D-F)

- Efficiency/Conservation Measures Implemented to date
- CO2 reductions
- Energy reduced by funds spent

Projected Economic Development Benefit (Appendix G)

- Job creation / job retention
- Market transformation
- Other economic development benefits associated with this project

Bonus

- Municipalities with Environmental Justice populations pursuant to the Commonwealth of Massachusetts Environmental Justice Policy of 2002
 - Web-link:
http://www.mass.gov/?pageID=eoeaterminal&L=2&L0=Home&L1=Grants+%26+Technical+Assistance&sid=Eoeea&b=terminalcontent&f=eea_sgse_env_equity&csid=Eoeea
- Regional Applications
- As-of-Right Zoning for generation
- Innovative Green Initiatives Implemented (Appendix D)

FUNDING REQUEST

Please check the boxes that best describe the project you are requesting funding for. In addition, please provide a brief description of the project as well as the amount of funding requested. A more extensive description is requested in Appendix A. Applicants must complete all appendices for each project.

INTRODUCTION

The Town of Sudbury has been engaged in an ongoing effort to reduce energy consumption and promote sustainability, and has identified an array of prospective projects to implement its energy reduction plan in accordance with its Green Community commitment. The aggregate cost of the projects identified to date exceeds \$750,000. The projects specified in this application were selected on the basis of cost-effectiveness in reducing energy consumption versus ability to be accomplished within the town's allocated Green community funding.

A separate Appendix A is provided for each project; subsequent appendices include all of the four projects.

ENERGY EFFICIENCY PROJECT

Funding for all or portion of costs of studying, designing, constructing and implementing of energy efficiency activities **(please check the applicable boxes)**

Energy efficiency measures

Project Description: Proposed energy efficiency projects fall into three categories:

- 1) Lighting controls in 5 Sudbury Public Schools buildings;
- 2) HVAC controls: 3 systems serving the Fairbanks Community Center, and mapping of the control bus at Lincoln/Sudbury Regional High School;
- 3) Supplemental funding to purchase a highly fuel-efficient replacement administrative vehicle;

Funding Requested: \$132,238

Other energy efficiency related activity/project

Project Description: Purchase of an Infrared thermal imaging camera to provide feedback on building efficiency.

Funding Requested: \$4,000

APPENDIX A Project Narrative

Please describe the project proposed including the scope, purpose, benefits, process to be followed, timeline and anticipated impact.

Energy Efficiency Measure 1: Schools Lighting Controls

In an effort to reduce energy wasted from lighting unoccupied areas, Sudbury has solicited bids for occupancy sensors for the Town's school buildings. These automatic sensors will save the Town thousands of kilowatt hours, and thousands of dollars just by ensuring that lights are turned off when a room is unoccupied. For this grant, we are seeking funding to assist with the costs of adding these lighting controls to the five Sudbury schools. Additional cost-saving will be received from generous incentives from the electric utility NSTAR.

The sensors (see figure 1 for an example) will be installed on the walls and ceilings of hallways, classrooms, gymnasiums. These projects are ready to start as soon as funding is available, and have an anticipated simple payback of less than 5 years. The total annual energy savings from these five projects is estimated to be 936,431 MMBtu.



Figure 1

Following is a summary of work to be completed.

Peter Noyes Elementary School

Totals Estimated Cost	\$36,405.36
Estimated NSTAR Cash Incentive	\$17,254.00
Net Customer Investment	\$19,151.36
Estimated Annual MMBTU Energy Savings	235,477
Estimated Annual Energy Cost Savings	\$9,662.02
Simple Payback	2.0 years

Nixon Elementary School

Totals Estimated Cost	\$22,535.21
Estimated NSTAR Cash Incentive	\$13,066.00
Net Customer Investment	\$9,469.21
Estimated Annual MMBTU Energy Savings	178,318
Estimated Annual Energy Cost Savings	\$7,316.69
Simple Payback	1.3 years

Loring Elementary School

Totals Estimated Cost	\$30,889.16
Estimated NSTAR Cash Incentive	\$16,000.00
Net Customer Investment	\$14,889.16
Estimated Annual MMBTU Energy Savings	218,368
Estimated Annual Energy Cost Savings	\$8,959.99
Simple Payback	1.7 years

Haynes Elementary School

Totals Estimated Cost	\$12,419.00
Estimated NSTAR Cash Incentive	\$3,446.00
Net Customer Investment	\$8,973.09
Estimated Annual MMBTU Energy Savings	47,032
Estimated Annual Energy Cost Savings	\$1,929.78
Simple Payback	4.6 years

Curtis Middle School

Totals Estimated Cost	\$50,924.95
Estimated NSTAR Cash Incentive	\$18,848.00
Net Customer Investment	\$32,076.95
Estimated Annual MMBTU Energy Savings	257,236
Estimated Annual Energy Cost Savings	\$10,554.84
Simple Payback	3.0 years

APPENDIX A Project Narrative

Please describe the project proposed including the scope, purpose, benefits, process to be followed, timeline and anticipated impact.

Energy Efficiency Measure 2: Heating, Ventilating, Air Conditioning (HVAC) and Solar Systems Direct Digital Controls (DDC)

Please describe the project proposed including the scope, purpose, benefits, process to be followed, timeline and anticipated impact.

Item	Scope	Purpose	Benefits	Process	Timeline and Impact
DDC for the heating plant at the Fairbank Community Center (FCC)	Add computer based HVAC controls for the boiler plant –see below for detailed scope of work	Energy savings, increased comfort of occupants, reduced maintenance costs	Reduced operating costs and GHG emissions, reduced maintenance burden	Select contractor – bidding process is completed	Project to be installed this summer
DDC for the SPS Heating Ventilation and Air Conditioning Unit at FCC	Add computer based HVAC controls for an air handling units – see below for detailed scope of work	Energy savings, increased comfort of occupants, reduced maintenance costs	Reduced operating costs and GHG emissions, reduced maintenance burden	Select contractor – bidding process is completed	Project to be installed this summer
DDC for solar PV and thermal systems at FCC	Add enhanced computer based controls and displays for two solar systems – see below for detailed scope of work	Increased diagnostics, public awareness via an integrated, customized interface	Reduced operating costs and GHG emissions, reduced maintenance burden	Bid the item and select contractor	Project to be installed this summer
Communications Bus Mapping and Optimization for the HVAC DDC system at the Lincoln Sudbury Regional High School	A study to document and improve the HVAC controls communications bus	Increased reliability of the bus, improved control system performance, reduced maintenance costs	Reduced operating costs and GHG emissions, reduced maintenance burden	Bid the item and select contractor	Project to be completed this summer

Table HVAC and Solar DDC Projects

Detailed Scope of Work Description DDC for the heating plant at the Fairbank Community Center (FCC)

1. DDC for the Space Heating Boiler Plant and Zone Sensors
 - a. Furnish and install DDC stop/start/status for each boiler, B-1 and B-2
 - i. Alternate the lead and lag boilers weekly
 - ii. Each boiler shall operate from its packaged controls including hot water supply temperature reset
 - iii. The combustion air damper shall continue to operate as controlled from the boiler plant
 - b. Furnish and install DDC HWS and HWR temperature sensors for the primary loop and each of the three main zone loops (excluding P-5)
 - c. Furnish and install DDC stop/start/status for each of P1 and P1-A, the primary loop pumps
 - d. Furnish and install DDC stop/start/status for each of P2 and P2-A, zone loop pumps
 - e. Furnish and install DDC stop/start/status for each of P3 and P3-A, zone loop pumps
 - f. Furnish and install DDC stop/start/status for each of P4 and P4-A, zone loop pumps
 - g. Furnish and install DDC stop/start/status for zone pump P5
 - i. No pump shall operate if the outside air temperature is above 60 deg. F or if the boiler plant is disabled
 - ii. The primary pumps shall not operate until any zone pump operates
 - iii. The zone pumps shall operate only if their representative zone sensor(s) temperature is less than their set point(s) and the outside air temperature is less than 55 deg. F. (all setpoints adjustable)
 - iv. Each lag pump shall be a standby at all times. Automatic switching to the lag pump shall take place if the lead pump fails and an alarm shall be generated.
 - h. Zone Sensors list

2.

Room	Zone	Description
10 Office	School Dept.	
20 Office	School Dept.	
65 Meeting Room	Senior Center	
61 Multipurpose room	Recreation Dept	
62 Kitchen	Recreation Dept	
46 Office	Recreation Dept	
39 Locker Corridor	Natatorium	Sensor for P-5
40 Women's Lockers	Natatorium	
50 Natatorium	Natatorium	

Detailed Scope of Work Description DDC for the SPS Heating Ventilation and Air Conditioning Unit at FCC

1. DDC for HVAC-1, Sudbury School Department
 - a. Furnish and install a DDC space temperature sensor with timed override switch in an Office 10
 - b. Furnish and install DDC for the outside and return air dampers
 - c. Furnish and install DDC for the heating valve
 - d. Furnish and install DDC for the DX cooling
 - e. Furnish and install DDC for supply fan start/stop and status
 - f. Furnish and install DDC for discharge air temperature control
 - g. HVAC-1 shall be enabled during occupied period from its time schedule or local override
 - h. Occupied Mode
 - i. The outside air damper shall open to its minimum position during the occupied period and closed during the unoccupied period.
 - ii. The hot water valve and cooling shall be sequentially modulated to maintain a supply air temperature of 60 deg. F during the occupied mode. A dead band of 4 deg shall be maintained between heating and cooling modes
 - iii. If at any time the discharge air drops below the user defined discharge air temperature low limit, an alarm shall be issued and the mixing dampers shall be driven closed to the outside air.
 - i. Unoccupied Mode
 - i. The unit shall cease to operate: its fan shall be off, its outdoor air damper shall close and the space temperature set point shall be set to the unoccupied value. On a drop in space temperature below the unoccupied set point the supply air fan shall cycle at 100% speed, on 100 % return air and full heat to maintain the set point.
 - ii. Should the temperature at the low temp thermostat in the leaving side of the heating coil drop below its set point the unit shall stop.
 - iii. Stopping the unit shall stop the supply air fan, close the outdoor air shut off damper, close the outdoor air and relief air damper open the return air damper and the heating coil valve shall be controlled from the discharge air sensor to maintain a set point of 80 deg.

Detailed Scope of Work Description DDC for solar PV and thermal systems at FCC

a. Solar Photovoltaic (PV) System Monitoring

- i. Furnish and install a MODBUS RTU bus from the FX60 to the PV inverter, a Solectria PVI, or equal. This bus will also be connected to device(s) included for the solar thermal monitoring described below. The following inverter data shall be made available via this connection: instantaneous demand (kW AC), accumulated electric energy generated (kWh), instantaneous current (I AC) and instantaneous voltage (V AC)
- ii. Furnish and install the following graphic "screen", utilizing photos and PDF(s) furnished by the Town of Sudbury
 1. an overview graphic showing a photo of the collector array with a list of the points above
 2. a graphic showing the schematic diagram of the system with point values and equipment status for the system (schematic furnished)

b. Solar Thermal System Monitoring and Control

- i. Refer to the attached drawing, **SWH-A2**, for a schematic of the system. Note: all temperature wells will be by others
- ii. Furnish and install a device bus from the FX60 building controller to accomplish the following scope of work. The bus shall be in accordance with BACNet™, or, if approved, the LonWorks™ specification.
- iii. Furnish and install BTL listed or LonMark approved DDC controller(s) to accomplish the following:
 1. Furnish and install temperature sensor **T_S-1** in the solar supply (SS) piping, outdoors, at the top of the solar array indicated the drawing
 2. Furnish and install temperature sensors **T_S-2**, **T_S-3** to sense the bottom temperature in the storage tank and the top temperature in the storage tank, respectively
 3. Furnish and install temperature sensor **T_S-4** as in the hot inlet piping to the heat exchanger on its primary side indicated on the drawing
 4. Furnish and install temperature sensors **T_{DHW}-1**, **T_{DHW}-2** and energy meter, **BTU-1**, on the solar domestic hot water (secondary) side of the heat exchanger
 5. Furnish and install temperature sensor **T_{DHW}-3** in the domestic hot water supply piping
 6. Furnish and install stop/start and status for the solar collector pump, **PG-1**
 7. Furnish and install stop/start and status for the primary heat exchanger pump, **PS-1**
 8. Furnish and install a MODBUS RTU bus connection to **BTU-1** (Kele 380HS20, or equal)
 9. Sequence of Operation
 - a. PG-1 is normally off. If the difference in temperature between **T_S-2 and T_S-1** is greater than or equal to 4 deg. F , then **PG-1** is energized.
 - b. PS-1 is normally off. If the difference in temperature between **T_S-3 and T_{DHW}-2** is greater than or equal to 2 deg. F , then **PS-1** is energized.
 10. Furnish and install the following graphic screens, utilizing photos and pdf(s) furnished by the Town of Sudbury
 - a. an overview graphic showing a photo of the collector array with the following parameters from BTU-1 listed (detail TBD)
 - b. a graphic showing the schematic diagram of the system with point values and equipment status for the system (schematic furnished)

Detailed Scope of Work Description DDC for Communications Bus Mapping and Optimization for the HVAC DDC system at the Lincoln Sudbury Regional High School

1. Identify the source of communications errors on the HVAC DDC communications bus
2. Identify the prevalence and location of seemingly random “outages” in parts of the system
3. Identify the types of wire used for the bus in different parts of the building and its interactions
4. Identify the application of repeaters used in different parts of the system
5. Identify the need for termination devices in segments of the system
6. Create a detailed list of modifications required to bring the bus to Lonworks performance specification
7. Document the bus with detailed plan and schematic drawings

APPENDIX A Project Narrative

Please describe the project proposed including the scope, purpose, benefits, process to be followed, timeline and anticipated impact.

Energy efficiency Measure 3: Purchase Fuel Efficient Vehicle

This Project request is for \$8,255 in order to assist the Town in the purchase of a Hybrid Ford Fusion Police vehicle. Currently, the Town has budgeted \$19,695 for the purchase of a police vehicle in FY11. This subsidy will allow the police department to buy a vehicle that will be a significant step in achieving the Town's goal to reduce its carbon footprint.

The estimated combined city and highway MPG for the new Ford Fusion Hybrid is 39. The savings per year in fuel is estimated to be 350 gallons, or 8.33 barrels. This is a significant energy savings, reducing fuel costs, carbon footprint and air pollution. The difference between 39 miles per gallon and 21 miles per gallon can amount to the prevention of over 30 tons of carbon dioxide over a vehicles lifetime.

Buying a more fuel efficient vehicle will also help to reduce our nation's dependence on fossil fuels.

And, of course, we will save money by having to fuel up less often.

- Total project cost \$27,950
- Town project investment \$19,695
- Net grant request \$8,255
- Fossil fuel energy reduced
- CO2 reduction
- Estimated annual energy savings \$1,001
- Simple payback 8.2 years



Models & Options / Compare

Prices for May 19, 2010 and ZIP code 02101

- Packages
- Interior Features
- Exterior Features
- Power and Handling
- Safety
- Accessories
- View All



I4 S

[Remove](#)



Hybrid

[Remove](#)

\$19,695

Starting MSRP¹

MPG City/Hwy 23/34²

\$27,950

Starting MSRP¹

MPG City/Hwy 41/36²

[Expand All](#) | [Collapse All](#)

Packages

I4 S

Hybrid

Interior Features

I4 S

Hybrid

Exterior Features

I4 S

Hybrid

Power and Handling

I4 S

Hybrid

Safety

I4 S

Hybrid

Accessories

I4 S

Hybrid

Disclaimers::

1. Starting Manufacturers Suggested Retail Price, excluding destination/delivery charge, taxes, title and registration fees. Optional equipment not included.
2. MPG - EPA estimated base engine/transmission. Note: F-150 SFE Package. Note: Fiesta SFE Package; Projected 30 city/40 hwy mpg. Ford preliminary data. Pending EPA certification. Note: 2011 Mustang - EPA-Estimated V6 automatic; GT manual.
4. Option price based on Manufactures Suggested Retail Price. Monthly payment based on 7% Ford Credit APR for 60 months. See dealer for qualifications.

[Back To Top](#)



- Find a Car
- Compare Side-by-Side
- Search by Class
- Search by Make
- Search by MPG
- Advanced Search
- Cars that don't need gasoline
- Best and Worst MPG

[Use Your Gas Prices & Annual Miles](#)

Switch Units:
[Gallons/100 Miles](#)
[Liters/100 km](#)

[New MPG tests are more realistic](#)

[Learn more about "Your MPG"](#)

[Remove](#) **2010 Ford Fusion Hybrid FWD** |
 [Remove](#) **2010 Ford Fusion FWD** |
 [Remove](#) **2010 Ford Taurus AWD**



Hybrid Vehicle
 Possible Tax Incentives

Estimated New EPA MPG								
REGULAR GASOLINE			REGULAR GASOLINE			REGULAR GASOLINE		
41	39	36	18	21	27	17	20	25
City	Combined	Hwy	City	Combined	Hwy	City	Combined	Hwy

MPG Estimates from Drivers Like You		
Average based on 24 vehicles.		
37.9	Lo	Hi
30	→	51
View Individual Estimates		
Average based on 3 vehicles.		
19.4	Lo	Hi
18	→	22
View Individual Estimates		

User fueleconomy estimates are not yet available for this vehicle. [Disclaim](#)

Fuel Economics		
\$1.83	\$3.40	\$3.57
Fuel to Drive 25 Miles	Fuel to Drive 25 Miles	Fuel to Drive 25 Miles
0.64 gal	1.19 gal	1.25 gal
\$43.76	\$45.04	\$48.91
Cost of a Fill-up	Cost of a Fill-up	Cost of a Fill-up
597 miles	331 miles	342 miles
Miles on a Tank	Miles on a Tank	Miles on a Tank
17.0 gal	17.5 gal	19.0 gal
Tank Size	Tank Size	Tank Size
Annual Fuel Cost*	Annual Fuel Cost*	Annual Fuel Cost*
\$1098	\$2042	\$2145

Cost to drive 25 Miles
Fuel to Drive 25 Miles
Cost of a Fill-up
Miles on a Tank
Tank Size
Annual Fuel Cost*

Based on 45% highway driving, 55% city driving, 15000 annual miles and Reg. Gas: \$2.86 per gallon. You may personalize these values to reflect the price of fuel in your area and your own driving patterns.

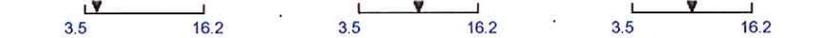
Energy Impact Score		
8.8 barrels	16.3 barrels	17.1 barrels
Annual Petroleum Consumption	Annual Petroleum Consumption	Annual Petroleum Consumption
(1 barrel=42 gallons)	(1 barrel=42 gallons)	(1 barrel=42 gallons)

Annual Petroleum Consumption
 (1 barrel=42 gallons)

Carbon Footprint		
4.8	8.9	9.3
Annual Tons of CO ₂ Emitted	Annual Tons of CO ₂ Emitted	Annual Tons of CO ₂ Emitted

Annual Tons of CO₂ Emitted

[Personalize Annual Miles](#)



EPA Air Pollution Score		
8	6	6
Air Pollution Score	Air Pollution Score	Air Pollution Score

Air Pollution Score

- ▶ [Show Scores for California and Northeast States](#)
- ▶ [Show Detailed Air Pollution Information](#)

More about emissions....

- [What's the difference between air pollution and greenhouse gases?](#)
- [Want more info? See EPA's Green Vehicle Guide](#)

Safety	Crash Test Results	Crash Test Results	Crash Test Results
EPA Size Class	Midsize Cars	Midsize Cars	Large Cars
Engine Size (liters)	2.5	3.5	3.5
Cylinders	4	6	6

APPENDIX A Project Narrative

Please describe the project proposed including the scope, purpose, benefits, process to be followed, timeline and anticipated impact.

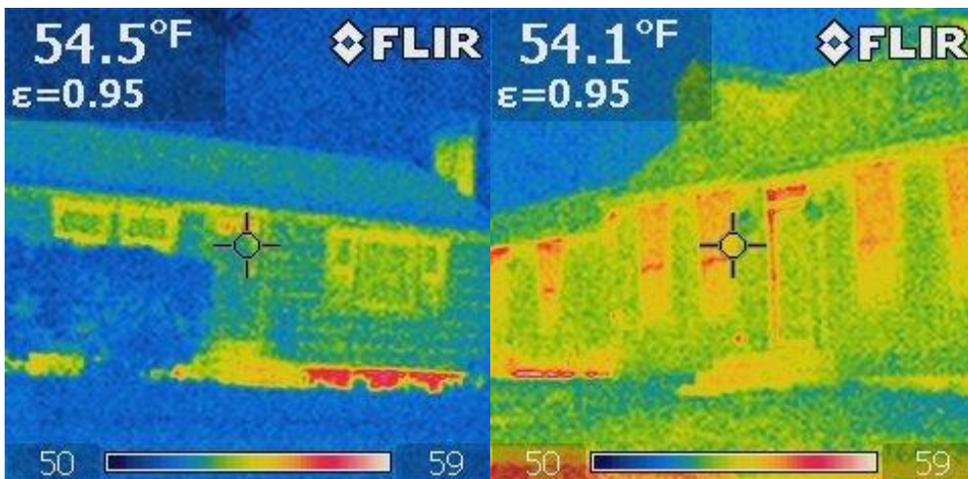
Other Energy Efficiency Related Activity/Project: Infrared Camera Purchase

Teaching / on-site verification / Town Building energy maintenance tool – thermal imaging camera for Sudbury Building Department., \$4000

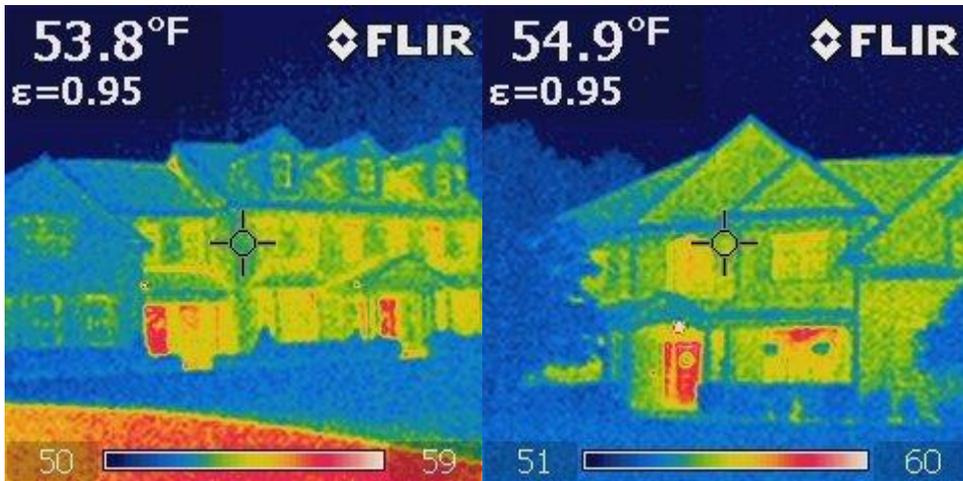
With the adoption of the Stretch Code, the Building Department is now tasked with reviewing projects in greater detail and educating builders about how to improve practices for reduced energy consumption. A thermal imaging camera can be used on-site to assess insulation installations in the course of normal inspections, providing direct visual feedback to the advantage of the project being reviewed, and to assist in the training of builders to make their future buildings more energy efficient.

The Sudbury Building Department is also actively involved in assessing town buildings for energy performance. With a thermal camera, finding energy waste can be rapidly accomplished, as can be seen in the attached thermal images of several building around town.

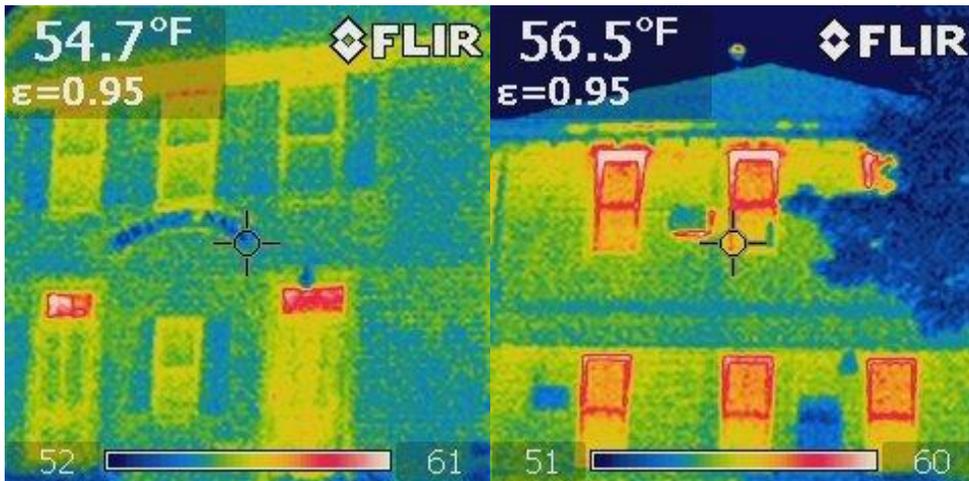
To give some examples of the ways in which an Infrared (IR) camera would be useful for the town Building Department as it relates to energy, some shots were collected from a random sample of buildings in town, seen below. The Building Department provides many building related services to the town where an IR camera would create opportunities for energy conservation and teaching that go unrealized for not having direct feedback similar to IR photos.



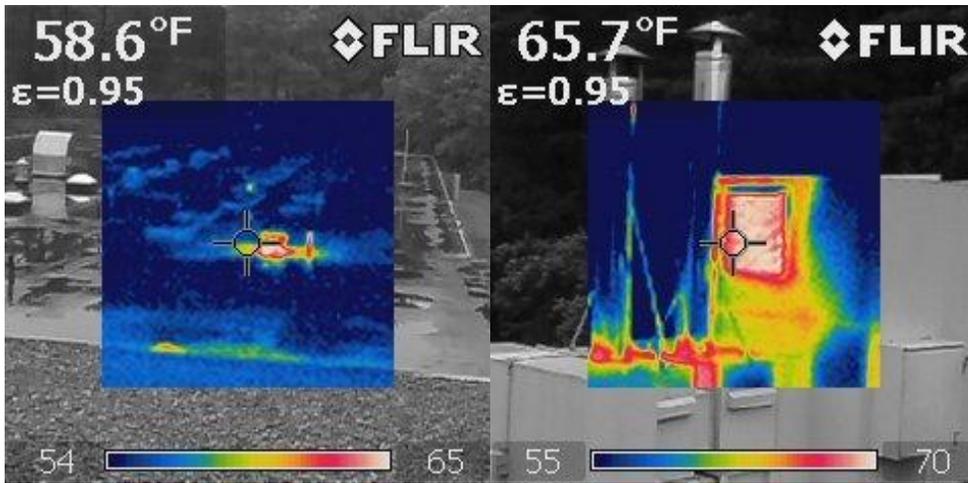
Older homes that could potentially use energy retrofits. Based on the reddish highlights in these pictures, the house on both left and right could be reviewed for adding basement insulation; the house on right shows some increased heat loss over front door that could be investigated.



Checking of new homes, potentially during the construction process. These newer homes show quite uniform temperatures over the exterior, aside from the doors, likely meaning that wall insulation has been well installed.



Town buildings overseen by the building department. Exterior surface temperatures are relatively uniform for these 2 town buildings suggesting reasonable thermal performance, aside from a pair of special transom windows on the left building, and window frames on the right building.



Review of special energy intensive buildings to find opportunities for energy conservation measures. The above pictures are from a town natatorium building, and show a roof mounted exhaust fan on the left, and the pool ventilation system unit on the right, both potentially sources of recoverable thermal energy.

As can be seen, IR photos make heat flows quite obvious.

While people might intuitively understand heat flows as they relate to buildings, providing Sudbury’s Building Department with an IR camera that displays heat flow directly will be a valuable tool not only for finding potential areas for conservation measures, but also to give the builders and contractors that the building inspector(s) deal with on a daily basis better information and feedback on how to build more energy efficient buildings.

Shopping Cart
Instrumart.com

Website: <http://www.instrumart.com>
Phone: 1-800-884-4967
Fax: 1-802-863-1193
Email: sales@instrumart.com

Part Number	Description	Quantity	Price	Extended
0560 8753	Testo 875 Series Thermal Imagers	1	\$3,950.00	\$3,950.00
	Availability In stock			
	Base Price \$2,995.00			
	Package 875-2 Thermal Imager (Integrated Digital Camera) (+\$955.00)			

Total \$3,950.00

If you'd like to talk to an engineer about any of the items in your shopping cart, please call **800-884-4967**, Monday - Friday, 8:30am - 6:00pm EST.

You can also send us an email at sales@instrumart.com.

[Return to the shopping cart](#)



testo 875

Thermal Imager

Testo 875 Thermal Imager for Building Energy Performance

Saving time, energy and money

Use the testo 875 thermal imager to quickly identify problems and defects in building envelopes. Use it to evaluate building energy losses and cut down on expensive heating and cooling bills. Energy savings and damage prevention are all in a days work with the testo 875.

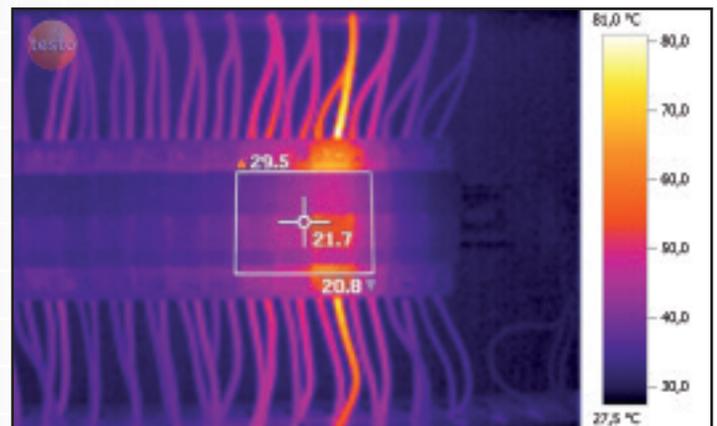


Meets BPI/RESNET Infrared Imaging System Performance Standards requirements for thermal imagers.

FEATURES

- A large 3.5" LCD screen for easier onsite image analysis
- Best in class 160x120 thermal array
- BPI/RESNET compliant for weatherization/HVAC applications
- < 80 mK NETD to insure the detection of small thermal variations
- Large 2GB SD card for expanded image storage
- TwinPix software technology blends thermal and visual image together
- Surface moisture recognition (875-2 model only)

Unique TwinPix software blends both the thermal and visual image together into one image





Thermal Imager

Technical Data

Detector type	FPA 160 x 120 pixels, a.Si
Thermal sensitivity (NETD)	<80 mK at +30 °C(86°F)
Field of view/min. focus distance	32° x 23° / 4" (standard lens), 9° x 7° / 20" (telephoto lens)
Geometric resolution (IFOV)	3.3 mrad (standard lens), 1.0 mrad (telephoto lens)
Image refresh rate	9 Hz
Focus	manual
Spectral range	8 to 14 µm
Optical field/min. focus distance	33° x 25° / 0.4 m
Image size	640 x 480 pixels
Image display	3.5" LCD with 320 x 240 pixels
Display options	only IR image 875-1, IR and digital image 875-2
Video output	USB 2.0
Color palettes	4 options (ironbow, rainbow, blue/red, greyscale)
Temperature range	-4 to 232°F (-20 °C to +100 °C) 32 to 536°F (0 °C to +280 °C), (switchable)
Accuracy	±2 °C, ±2 % of rdg, (-4 °F to +536 °F)
Minimum diameter measurement point	0.4" at 3 ft. (standard lens), 0.12" at 3 ft. (telephoto lens)
Setting emissivity	0.01 to 1
File format	.bmt; export options in .bmp, .jpg, .csv
Data storage device	2 GB SD card (approx. 1000 images)
Battery type	Li-ion battery
Operating time	4 hours
Operating temperature range	5 °F to +104 °F
Storage temperature range	-22 °F to +140 °F
Protection class of housing	IP54
Weight	approx. 2 lbs
Dimensions (L x W x H)	6" x 4.2" x 10.3"
Tripod mounting	Yes
Housing	ABS
PC software	
System requirements	Windows XP, Windows Vista, USB 2.0 interface, Windows 7, 32 Bit
Warranty	2 years

Ordering Information

875-1 Thermal Imager Kit	0560 8754
875-2 Thermal Imager Kit with integrated digital camera	0560 8753
875-2 Deluxe thermal imager kit with integrated camera, telephoto lens, protective lens, 2 bay battery charger, spare battery and display sunshield	0563 8753

Note: all imager kits include hard shell case, SD-card, USB-cable, software, power supply and tripod mounting plate

Accessories

Aluminum tripod	0554 8804
Protective lens	0554 8805
Additional battery	0554 8802
Two bay charger	0554 8801
Display Sun Shield	0554 8806
Emissivity adhesive tape Heatproof up to +572 °F	0554 0051
Soft-Case w/ shoulder strap	0554 8814

Distributor:

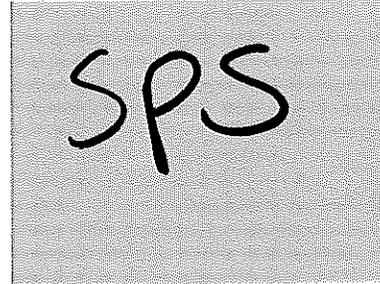
See our testo 881 model at www.testo.com/thermal - ideal for industrial predictive and preventive maintenance

testo, Inc. • 800-227-0729 • e-mail: info@testo.com • www.testo.com/thermal

APPENDIX B Project Viability

Please provide applicable feasibility studies, site analysis, audits/assessments, design documents, contracts, construction schedule and anticipated completion date or other analysis to support the viability of the proposed project.

Please see the detailed cost feasibility studies of the lighting controls projects on the following pages. HVAC Controls projects have received feasibility-grade costing by an outside vendor. Other project costs have been developed in-house. All projects are viable and can be constructed within six months of grant receipt.



April 12, 2010

Sudbury School Department
40 Fairbanks Road
Sudbury, MA 01776

Dear Mr. Joe Kupczewski:

AECOM, Contractor for NSTAR Electric Company's Municipal Program, is pleased to submit our detailed energy audit report and scope of work for your facility. This proposal is based on the results of an energy audit and includes recommended energy saving upgrades and incentive calculations for your project.

When you are ready to proceed with the project, please sign and return one copy of this proposal to AECOM. We will complete and process the Municipal Program Application Form through your NSTAR Electric Company Program Manager.

We appreciate this opportunity to assist you in reaching your energy conservation and facility improvement goals. If we can be of further assistance, please feel free to call.

Very truly yours,

AECOM

A handwritten signature in black ink, appearing to read 'Brian Fenochietti', written over the AECOM logo.

Brian Fenochietti
Senior Program Manager



66 Long Wharf
 Boston, MA 02110
 Office: 617-723-1700
 Fax: 617-723-8116
 www.aecom.com

Sudbury School Department
 40 Fairbanks Road
 Sudbury, MA 01776
 978-443-1058 ext.223
 MP090076

ENERGY SAVINGS PROPOSAL
NSTAR MUNICIPAL PROGRAM

*We are pleased to submit our detailed energy audit report and scope of work for
 Peter Noyes Elementary School- 280 Old Sudbury Road*

This proposal is based on the results of an energy audit which we conducted at your facility and includes the following:

- Recommended energy-saving upgrades.
- Cost, savings, and estimated NSTAR Electric Company incentive calculations.
- NSTAR Electric Company incentive application worksheets.
- NSTAR Electric Company terms and conditions to qualify for the program.

PROJECT PROFILE:

TOTAL INVESTMENT COST	\$36,405.36
ESTIMATED NSTAR CASH INCENTIVE	\$17,254.00
NET CUSTOMER INVESTMENT	\$19,151.36
ESTIMATED ANNUAL ENERGY COST SAVINGS	\$ 9,662.02
SIMPLE PAYBACK	2.0 years

We propose hereby to furnish material and labor – complete in accordance with the above specifications, for the Total Investment Cost of \$36,405.36. Customer has chosen the following option as payment for the Net Cost of \$19,151.36. Customer further agrees these are preliminary costs and subject to change upon final installation.

PAYMENT OPTIONS::

LUMP SUM 1 Net Cost to Customer \$19,151.36 Payable to AECOM

LUMP SUM 2 Net Cost to Customer - ½ down payment due upon acceptance of this proposal, \$9,575.68.... Balance due upon completion of said installation, \$9,575.68.

FINANCING: Yes, I would like to finance my portion of the project cost through NSTAR.

AECOM Authorized Signature: _____ **Proposal**

Title: _____ **Date:** _____

Note: This proposal may be withdrawn by us if not accepted within 30 days.
 Payment terms, warranty information and owners responsibility are listed below.

- AECOM to provide a One (1) year warranty on labor and materials. Additional material warranties are available.
- The company and the customer agree that any alteration or deviation from the specifications set forth in the contract agreement, including extra costs will be executed upon verbal and/ or written orders, and will become extra charges over and above the contract price.
- AECOM shall keep and maintain adequate insurance coverage, including Workmen's Compensation Insurance.
- Work will be done during normal business hours. We will provide 48 hours notice before contractors enter the building. Maintenance personnel must be available when contractors are in the building. Access to all affected electrical equipment will be necessary.
- Customer to provide trash disposal services and/or dumpster if needed.
- All agreements are contingent upon strikes, accidents or delays beyond our control.
- AECOM to notify NSTAR Recycling Contractor at the completion of installation, to provide removal and disposal of fluorescent lighting ballasts with customer. Lamp disposal is the responsibility of the customer, unless customer agrees to the added charge for disposal of said lamps.
- This agreement shall commence after receipt of NSTAR Electric Company's written approval of the Municipal Program Incentives.

Cost/Ben Range should be not r

Cost/Ben	0.25
----------	------

NSTAR Municipal Program Custom/Comprehensive Energy Efficiency Projects

Recommendations & Estimated Return On Investment (R.O.I.)

prepared by: AECOM Energy

NSTAR APPLICATION NO: BS8774
 AECOM Energy ID NO: MF090076
 FACILITY NAME: Sudbury School Dept.-Peter Noyes Elementary
 ADDRESS: 280 Old Sudbury Road
 CITY/TOWN/ZIP: Sudbury
 CONTACT: Joe Kupczewski
 PHONE: 978-639-3223

DATE: 7/1/2008
 AUDITOR: Brian Fenochietti
 ACCT NO: 25993171005
 FID NO/STATUS: 046001315

** Avg. kWh rate 0.140

0

INSTALLATION SITE	DESCRIPTION	QTY	Total Cost	Requested Incentive	Net Cost of Installation	Total kWh Saved	Estimated Exist.Hrs.	Annual kwh Saved	Estimated \$\$ Saved **	Simple Payback
1 MAIN & SECOND	Install Ceiling Unit Occupancy Sensor	2	\$429.68	\$203.64	\$226.04	11.82	20	12,292.8	\$1,720.99	0.1
2	Install Ceiling Unit Occupancy Sensor	44	\$8,314.12	\$3,940.41	\$4,373.72	13.14	20	13,665.6	\$1,913.18	2.3
3	Install Ceiling Unit Power Pack	60	\$4,735.69	\$2,244.44	\$2,491.25					
4 MAIN & SECOND	Install Ceiling Unit Occupancy Sensor	10	\$2,148.40	\$1,018.21	\$1,130.18	2.52	20	2,620.8	\$366.91	3.1
5	Install Ceiling Unit Occupancy Sensor	22	\$4,157.06	\$1,970.20	\$2,186.86	2.16	20	2,246.4	\$314.50	7.0
6	Install Wall Switch Occupancy Sensor with Pla	4	\$282.19	\$133.74	\$148.45	0.60	20	624.0	\$87.36	1.7
7 MAIN & SECOND	Install Wall Switch Occupancy Sensor with Pla	6	\$423.28	\$200.61	\$222.67	0.24	20	249.6	\$34.94	6.4
8 MAIN & SECOND	Install Ceiling Unit Occupancy Sensor	30	\$5,688.72	\$2,686.64	\$2,982.08	28.42	20	29,561.0	\$4,198.53	0.7
9	Install Ceiling Unit Power Pack	60	\$4,735.69	\$2,244.44	\$2,491.25					
10 MAIN & SECOND	Install Wall Switch Occupancy Sensor with Pla	2	\$141.09	\$66.87	\$74.22	0.18	20	183.0	\$25.63	2.9
11 MAIN & SECOND	Install Wall Switch Occupancy Sensor with Pla	8	\$564.38	\$267.48	\$296.89	0.25	20	262.1	\$36.69	6.1
12 HALL	No Recommendation		\$0.00	\$0.00	\$0.00					
13 GYM	Install T5 Fixture Unit Occupancy Sensor	12	\$2,059.31	\$975.99	\$1,083.32	2.81	30	4,380.5	\$613.27	1.8
14 HALL	Install T5 Fixture Unit Occupancy Sensor	16	\$2,745.75	\$1,301.32	\$1,444.43	2.82	20	2,928.6	\$410.01	3.5
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
TOTALS:			\$36,405.36	\$17,254.00	\$19,151.36	64.96		69,014.4	\$9,662.02	2.0



66 Long Wharf
 Boston, MA 02110
 Office: 617-723-1700
 Fax: 617-723-8116
 www.aecom.com

Sudbury School Department
 40 Fairbanks Road
 Sudbury, MA 01776
 978-443-1058 ext.223
 MP090072

ENERGY SAVINGS PROPOSAL
NSTAR MUNICIPAL PROGRAM

*We are pleased to submit our detailed energy audit report and scope of work for
 Nixon School- 472 Concord Road*

This proposal is based on the results of an energy audit which we conducted at your facility and includes the following:

- Recommended energy-saving upgrades.
- Cost, savings, and estimated NSTAR Electric Company incentive calculations.
- NSTAR Electric Company incentive application worksheets.
- NSTAR Electric Company terms and conditions to qualify for the program.

PROJECT PROFILE:

TOTAL INVESTMENT COST	\$22,535.21
ESTIMATED NSTAR CASH INCENTIVE	\$13,066.00
NET CUSTOMER INVESTMENT	\$ 9,469.21
ESTIMATED ANNUAL ENERGY COST SAVINGS	\$ 7,316.69
SIMPLE PAYBACK	1.3 years

We propose hereby to furnish material and labor -- complete in accordance with the above specifications, for the Total Investment Cost of \$22,535.21. Customer has chosen the following option as payment for the Net Cost of \$9,469.21. Customer further agrees these are preliminary costs and subject to change upon final installation.

PAYMENT OPTIONS::

LUMP SUM 1 Net Cost to Customer \$9,469.21 Payable to AECOM

LUMP SUM 2 Net Cost to Customer - ½ down payment due upon acceptance of this proposal, \$4,734.60.... Balance due upon completion of said installation, \$4,734.61.

FINANCING: Yes, I would like to finance my portion of the project cost through NSTAR.

AECOM Authorized Signature: _____ Proposal

Title: _____ Date: _____

Note: This proposal may be withdrawn by us if not accepted within 30 days.

Payment terms, warranty information and owners responsibility are listed below.

- AECOM to provide a One (1) year warranty on labor and materials. Additional material warranties are available.
- The company and the customer agree that any alteration or deviation from the specifications set forth in the contract agreement, including extra costs will be executed upon verbal and/ or written orders, and will become extra charges over and above the contract price.
- AECOM shall keep and maintain adequate insurance coverage, including Workmen's Compensation Insurance.
- Work will be done during normal business hours. We will provide 48 hours notice before contractors enter the building. Maintenance personnel must be available when contractors are in the building. Access to all affected electrical equipment will be necessary.
- Customer to provide trash disposal services and/or dumpster if needed.
- All agreements are contingent upon strikes, accidents or delays beyond our control.
- AECOM to notify NSTAR Recycling Contractor at the completion of installation, to provide removal and disposal of fluorescent lighting ballasts with customer. Lamp disposal is the responsibility of the customer, unless customer agrees to the added charge for disposal of said lamps.
- This agreement shall commence after receipt of NSTAR Electric Company's written approval of the Municipal Program Incentives.

Range should be not r

Cost/Ben	0.25
----------	------

NSTAR Municipal Program Custom/Comprehensive Energy Efficiency Projects

Recommendations & Estimated Return On Investment (R.O.I.)

prepared by: AECOM Energy

NSTAR APPLICATION NO: BS8773
 AECOM Energy ID NO: MP090072
 FACILITY NAME: Sudbury School Dept. -Nixon School
 ADDRESS: 472 Concord Road
 CITY/TOWN/ZIP: Sudbury
 CONTACT: Joe Kupczewski
 PHONE: 978-443-1058 x223

DATE: 6/1/2008
 AUDITOR: Brian Fenochetti
 ACCT NO: 25993681003
 FID NO./STATUS: 046001315

** Ave. kWh/rat 0.140

	INSTALLATION SITE	DEVICE DESCRIPTION	QTY	Total Cost	Requested Incentive	Net Cost of Installation	Total KW Saved	Estimated Exist. Hrs.	Annual kWh Saved	Estimated \$\$ Saved **	Simple Payback					
1	ROOMS, OFFICES	Install Ceiling Unit Occupancy Sensor	44	\$8,314.12	\$4,820.56	\$3,493.56	38.64	20	40,185.6	\$5,625.98	0.6					
2	HALLS	Install Ceiling Unit Occupancy Sensor	6	\$1,289.04	\$747.39	\$541.65	2.22	20	2,308.8	\$323.23	1.7					
3	HALLS, ROOMS, OFFICES	Install Ceiling Unit Power Pack	106	\$8,366.38	\$4,850.88	\$3,515.52										
4	ROOMS, OFFICES	Install Wall Switch Occupancy Sensor with Pla	20	\$1,410.94	\$818.07	\$592.87	2.88	20	2,995.2	\$419.33	1.4					
5	ROOMS, OFFICES	Install Ceiling Unit Occupancy Sensor	1	\$188.96	\$109.56	\$79.40	2.02	20	2,105.0	\$294.69	0.3					
6	ROOMS, OFFICES	Install Ceiling Unit Power Pack	1	\$78.93	\$45.76	\$33.17										
7	ROOMS, OFFICES	Install Wall Switch Occupancy Sensor with Pla	2	\$141.09	\$81.81	\$59.29	0.26	20	274.6	\$38.44	1.5					
8	GYM	Install T5 Fixture Unit Occupancy Sensor	16	\$2,745.75	\$1,592.00	\$1,153.75	2.82	30	4,393.0	\$615.01	1.9					
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																
25																
26																
TOTALS:										\$22,635.21	\$13,066.00	\$9,469.21	48.84	\$2,262.1	\$7,316.69	1.3



66 Long Wharf
 Boston, MA 02110
 Office: 617-723-1700
 Fax: 617-723-8116
 www.aecom.com

Sudbury School Department
 40 Fairbanks Road
 Sudbury, MA 01776
 978-443-1058 ext.223
 MP090074

ENERGY SAVINGS PROPOSAL
NSTAR MUNICIPAL PROGRAM

*We are pleased to submit our detailed energy audit report and scope of work for
 Loring Middle School- 80 Woodside Road*

This proposal is based on the results of an energy audit which we conducted at your facility and includes the following:

- Recommended energy-saving upgrades.
- Cost, savings, and estimated NSTAR Electric Company incentive calculations.
- NSTAR Electric Company incentive application worksheets.
- NSTAR Electric Company terms and conditions to qualify for the program.

PROJECT PROFILE:

TOTAL INVESTMENT COST	\$30,889.16
ESTIMATED NSTAR CASH INCENTIVE	\$16,000.00
NET CUSTOMER INVESTMENT	\$14,889.16
ESTIMATED ANNUAL ENERGY COST SAVINGS	\$ 8,959.99
SIMPLE PAYBACK	1.7 years

We propose hereby to furnish material and labor – complete in accordance with the above specifications, for the Total Investment Cost of \$30,889.16. Customer has chosen the following option as payment for the Net Cost of \$14,889.16. Customer further agrees these are preliminary costs and subject to change upon final installation.

PAYMENT OPTIONS::

LUMP SUM 1 [] Net Cost to Customer \$14,889.16 Payable to AECOM

LUMP SUM 2 [] Net Cost to Customer - ½ down payment due upon acceptance of this proposal, \$7,444.58.... Balance due upon completion of said installation, \$7,444.58.

FINANCING: [] Yes, I would like to finance my portion of the project cost through NSTAR.

AECOM Authorized Signature: _____ Proposal

Title: _____ Date: _____

Note: This proposal may be withdrawn by us if not accepted within 30 days.
 Payment terms, warranty information and owners responsibility are listed below.

- *AECOM to provide a One (1) year warranty on labor and materials. Additional material warranties are available.*
- *The company and the customer agree that any alteration or deviation from the specifications set forth in the contract agreement, including extra costs will be executed upon verbal and/ or written orders, and will become extra charges over and above the contract price.*
- *AECOM shall keep and maintain adequate insurance coverage, including Workmen's Compensation Insurance.*
- *Work will be done during normal business hours. We will provide 48 hours notice before contractors enter the building. Maintenance personnel must be available when contractors are in the building. Access to all affected electrical equipment will be necessary.*
- *Customer to provide trash disposal services and/or dumpster if needed.*
- *All agreements are contingent upon strikes, accidents or delays beyond our control.*
- *AECOM to notify NSTAR Recycling Contractor at the completion of installation, to provide removal and disposal of fluorescent lighting ballasts with customer. Lamp disposal is the responsibility of the customer, unless customer agrees to the added charge for disposal of said lamps.*
- *This agreement shall commence after receipt of NSTAR Electric Company's written approval of the Municipal Program Incentives.*

Cost/Ben	0.25
----------	------

NSTAR Municipal Program Custom/Comprehensive Energy Efficiency Projects

Recommendations & Estimated Return On Investment (R.O.I.)

prepared by: AECOM Energy

NSTAR APPLICATION NO: BS8772
 AECOM Energy ID NO: MP090074
 FACILITY NAME: Sudbury School Dept.- Loring Middle School
 ADDRESS: 80 Woodside Road
 CITY/TOWN/ZIP: Sudbury
 CONTACT: Joe Kupczewski
 PHONE: 978-639-3223

DATE: 7/1/2008
 AUDITOR: Brian Fenochietti
 ACCT NO: 25990591007
 FID NO/STATU: 046001315

** Ave. kWh rate 0.140

INSTALLATION SITE	DEVICE DESCRIPTION	QTY	Total Cost	Requested Incentive	Net Cost of Installation	Total KW Saved	Estimated Exist. Hrs.	Annual kWh Saved	Estimated \$\$ Saved **	Simple Payback
1 HALL / CORRIDORS	Install Ceiling Unit Occupancy Sensor	12	\$2,578.08	\$1,335.40	\$1,242.68	5.40	20	5,616.0	\$786.24	1.6
2	Install Ceiling Unit Power Pack	16	\$1,262.95	\$654.13	\$608.72					
3 ROOMS CLASS ROOM	Install Wall Switch Occupancy Sensor with Pla	18	\$1,269.84	\$657.76	\$612.09	3.17	20	3,294.7	\$461.26	1.3
4 ROOMS CLASS ROOM	Install Ceiling Unit Occupancy Sensor	24	\$4,534.98	\$2,349.03	\$2,185.94	20.42	20	21,292.6	\$2,972.57	0.7
5	Install Ceiling Unit Power Pack	60	\$4,795.69	\$2,453.00	\$2,282.69					
6 ROOMS	Install Ceiling Unit Occupancy Sensor	14	\$2,645.40	\$1,370.27	\$1,275.13	11.65	20	12,113.9	\$1,695.95	0.8
7	Install Ceiling Unit Power Pack	42	\$3,314.98	\$1,717.10	\$1,597.88					
8	Install Wall Switch Occupancy Sensor with Pla	8	\$564.38	\$292.34	\$272.04	1.57	20	1,630.7	\$228.30	1.2
9 GIRLS/BOYS	Install Ceiling Unit Occupancy Sensor	10	\$1,889.57	\$978.76	\$910.81	0.51	20	530.4	\$74.26	12.3
10	Install Ceiling Unit Power Pack	10	\$789.28	\$408.83	\$380.45					
11 CAFÉ/CLASS	Install Ceiling Unit Occupancy Sensor	1	\$188.96	\$97.89	\$91.08	2.28	20	2,371.2	\$331.97	0.3
12	Install Ceiling Unit Power Pack	2	\$157.86	\$81.77	\$76.09					
13 CAFETERIA	3L4 T5 HO/ELIG Open Box Fixture w/Clear Le	8	\$2,528.30	\$1,309.61	\$1,218.69	2.23	84	9,749.4	\$1,364.91	0.9
14 CAFETERIA	Install T5 Fixture Unit Occupancy Sensor	8	\$908.88	\$470.78	\$438.09	1.41	20	1,484.3	\$205.00	2.1
15 GYM	Install T5 Fixture Unit Occupancy Sensor	16	\$2,745.75	\$1,422.25	\$1,323.50	3.74	30	5,840.6	\$817.69	1.6
16	Install Ceiling Unit Occupancy Sensor	1	\$188.96	\$97.88	\$91.08	0.10	30	156.0	\$21.84	4.2
17	Install Ceiling Unit Power Pack	1	\$78.93	\$40.88	\$38.04					
18	Power source abandoned-HID-interior/Exterior	8	\$210.00	\$108.78	\$101.22					
19	Relocate - HIF - Interior/Exterior	8	\$296.48	\$153.57	\$142.91					
20										
21										
22										
23										
24										
25										
26										
TOTALS:			\$30,889.16	\$16,000.00	\$14,889.16	52.47		63,999.9	\$8,959.99	1.7



66 Long Wharf
 Boston, MA 02110
 Office: 617-723-1700
 Fax: 617-723-8116
 www.aecom.com

Sudbury School Department
 40 Fairbanks Road
 Sudbury, MA 01776
 978-443-1058 ext.223
 MP090073

ENERGY SAVINGS PROPOSAL
NSTAR MUNICIPAL PROGRAM

*We are pleased to submit our detailed energy audit report and scope of work for
 Sudbury School Department- 169 Haynes Road*

This proposal is based on the results of an energy audit which we conducted at your facility and includes the following:

- Recommended energy-saving upgrades.
- Cost, savings, and estimated NSTAR Electric Company incentive calculations.
- NSTAR Electric Company incentive application worksheets.
- NSTAR Electric Company terms and conditions to qualify for the program.

PROJECT PROFILE:

TOTAL INVESTMENT COST	\$12,419.09
ESTIMATED NSTAR CASH INCENTIVE	\$ 3,446.00
NET CUSTOMER INVESTMENT	\$ 8,973.09
ESTIMATED ANNUAL ENERGY COST SAVINGS	\$ 1,929.78
SIMPLE PAYBACK	4.6 years

We propose hereby to furnish material and labor – complete in accordance with the above specifications, for the Total Investment Cost of \$12,419.09. Customer has chosen the following option as payment for the Net Cost of \$8,973.09. Customer further agrees these are preliminary costs and subject to change upon final installation.

PAYMENT OPTIONS::

LUMP SUM 1 [] Net Cost to Customer \$8,973.09 Payable to AECOM

LUMP SUM 2 [] Net Cost to Customer - ½ down payment due upon acceptance of this proposal, \$4,486.54.... Balance due upon completion of said installation, \$4,486.55.

FINANCING: [] Yes, I would like to finance my portion of the project cost through NSTAR.

AECOM Authorized Signature: _____ Proposal

Title: _____ Date: _____

Note: This proposal may be withdrawn by us if not accepted within 30 days.

Payment terms, warranty information and owners responsibility are listed below.

- *AECOM to provide a One (1) year warranty on labor and materials. Additional material warranties are available.*
- *The company and the customer agree that any alteration or deviation from the specifications set forth in the contract agreement, including extra costs will be executed upon verbal and/ or written orders, and will become extra charges over and above the contract price.*
- *AECOM shall keep and maintain adequate insurance coverage, including Workmen's Compensation Insurance.*
- *Work will be done during normal business hours. We will provide 48 hours notice before contractors enter the building. Maintenance personnel must be available when contractors are in the building. Access to all affected electrical equipment will be necessary.*
- *Customer to provide trash disposal services and/or dumpster if needed.*
- *All agreements are contingent upon strikes, accidents or delays beyond our control.*
- *AECOM to notify NSTAR Recycling Contractor at the completion of installation, to provide removal and disposal of fluorescent lighting ballasts with customer. Lamp disposal is the responsibility of the customer, unless customer agrees to the added charge for disposal of said lamps.*
- *This agreement shall commence after receipt of NSTAR Electric Company's written approval of the Municipal Program Incentives.*

Cost/Ben	0.25
----------	------

NSTAR Municipal Program Custom/Comprehensive Energy Efficiency Projects

Recommendations & Estimated Return On Investment (R.O.I.)

prepared by: AECOM Energy

NSTAR APPLICATION NO: BS 8771
 AECOM Energy ID NO: MP090073
 FACILITY NAME: Sudbury School Dept.- Josiah Hayne School
 ADDRESS: 169 Haynes Road
 CITY/TOWN/ZIP: Sudbury
 CONTACT: Joe Kupczewski
 PHONE: 978-689-3223

DATE: 7/1/2006
 AUDITOR: Steve Szotkowski
 ACCT NO: 25994741004
 FID NO/STATUS: 046001315

** Ave. kWh rate 0.140

0

INSTALLATION SITE	DEVICE DESCRIPTION	QTY	Total Cost	Requested Incentive	Net Cost of Installation	Total KW Saved	Estimated Exist. Hrs.	Annual kWh Saved	Estimated \$\$ Saved **	Simple Payback	
1 HALL	Install Ceiling Unit Occupancy Sensor w/ Dual	6	\$1,289.04	\$357.68	\$931.36	3.30	20	3,432.0	\$480.48	1.9	
2 ROOM, OFFICE	Install Ceiling Unit Occupancy Sensor	15	\$2,834.36	\$786.47	\$2,047.89	2.34	20	2,433.6	\$340.70	6.0	
3 HALL, ROOM, OFFICE	Install Ceiling Unit Power Pack	21	\$1,657.49	\$469.91	\$1,187.58						
4 ROOM, OFFICE	Install Wall Switch Occupancy Sensor with Pla	20	\$1,410.94	\$391.50	\$1,019.44	1.80	20	1,872.0	\$262.08	3.9	
5 ROOM, OFFICE	Install Ceiling Unit Occupancy Sensor	8	\$1,511.66	\$419.45	\$1,092.21	1.32	20	1,372.8	\$192.19	5.7	
6 ROOM, OFFICE	Install Ceiling Unit Power Pack	8	\$691.43	\$175.21	\$456.22						
7 ROOM, OFFICE	Install Wall Switch Occupancy Sensor with Pla	1	\$70.55	\$19.58	\$50.97	0.03	20	31.2	\$4.37	11.7	
8 WOMANS ROOM AND GYM	Install Ceiling Unit Occupancy Sensor	1	\$188.96	\$52.43	\$136.53	0.16	30	249.6	\$34.94	3.9	
9 WOMANS ROOM AND GYM	Install Ceiling Unit Power Pack	1	\$78.93	\$21.90	\$57.03						
10 GYM	Install Ts Fixture Unit Occupancy Sensor	16	\$2,745.75	\$761.88	\$1,983.87	2.82	30	4,393.0	\$615.01	3.2	
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
TOTALS:									\$13,784.2	\$1,929.78	4.6



66 Long Wharf
 Boston, MA 02110
 Office: 617-723-1700
 Fax: 617-723-8116
 www.aecom.com

Sudbury School Department
 40 Fairbanks Road
 Sudbury, MA 01776
 978-443-1058 ext.223
 MP090075

ENERGY SAVINGS PROPOSAL
NSTAR MUNICIPAL PROGRAM

*We are pleased to submit our detailed energy audit report and scope of work for
 Curtis Middle School- 22 Pratts Mill Road*

This proposal is based on the results of an energy audit which we conducted at your facility and includes the following:

- Recommended energy-saving upgrades.
- Cost, savings, and estimated NSTAR Electric Company incentive calculations.
- NSTAR Electric Company incentive application worksheets.
- NSTAR Electric Company terms and conditions to qualify for the program.

PROJECT PROFILE:

TOTAL INVESTMENT COST	\$50,924.95
ESTIMATED NSTAR CASH INCENTIVE	\$18,848.00
NET CUSTOMER INVESTMENT	\$32,076.95
ESTIMATED ANNUAL ENERGY COST SAVINGS	\$10,554.84
SIMPLE PAYBACK	3.0 years

We propose hereby to furnish material and labor – complete in accordance with the above specifications, for the Total Investment Cost of \$50,924.95. Customer has chosen the following option as payment for the Net Cost of \$32,076.95. Customer further agrees these are preliminary costs and subject to change upon final installation.

PAYMENT OPTIONS::

LUMP SUM 1 Net Cost to Customer \$32,076.95 Payable to AECOM

LUMP SUM 2 Net Cost to Customer - ½ down payment due upon acceptance of this proposal, \$16,038.47.... Balance due upon completion of said installation, \$16,038.48.

FINANCING: Yes, I would like to finance my portion of the project cost through NSTAR.

AECOM Authorized Signature: _____ **Proposal**

Title: _____ **Date:** _____

Note: This proposal may be withdrawn by us if not accepted within 30 days.

Payment terms, warranty information and owners responsibility are listed below.

- *AECOM to provide a One (1) year warranty on labor and materials. Additional material warranties are available.*
- *The company and the customer agree that any alteration or deviation from the specifications set forth in the contract agreement, including extra costs will be executed upon verbal and/ or written orders, and will become extra charges over and above the contract price.*
- *AECOM shall keep and maintain adequate insurance coverage, including Workmen's Compensation Insurance.*
- *Work will be done during normal business hours. We will provide 48 hours notice before contractors enter the building. Maintenance personnel must be available when contractors are in the building. Access to all affected electrical equipment will be necessary.*
- *Customer to provide trash disposal services and/or dumpster if needed.*
- *All agreements are contingent upon strikes, accidents or delays beyond our control.*
- *AECOM to notify NSTAR Recycling Contractor at the completion of installation, to provide removal and disposal of fluorescent lighting ballasts with customer. Lamp disposal is the responsibility of the customer, unless customer agrees to the added charge for disposal of said lamps.*
- *This agreement shall commence after receipt of NSTAR Electric Company's written approval of the Municipal Program Incentives.*

Cost/Ben Range should be not tr
0.25

NSTAR Municipal Program Custom/Comprehensive Energy Efficiency Projects

Recommendations & Estimated Return On Investment (R.O.I.)

prepared by: AECOM Energy

NSTAR APPLICATION NO: BS8770
 AECOM Energy ID NO: MP080075
 FACILITY NAME: Sudbury School Dept.-Curtis Middle School
 ADDRESS: 22 Pratts Mill Road
 CITY/TOWN/ZIP: Sudbury
 CONTACT: Joe Kupczewski
 PHONE: 978-639-3223

DATE: 7/1/2008

AUDITOR: Brian Ferochietti
 ACCT NO: 2599677100
 FID NO/STATUS: 046001315

** Ave. kWh rate 0.140

0

INSTALLATION SITE	DEVICE DESCRIPTION	QTY	Total Cost	Requested Incentive	Net Cost of Installation	Total kW Saved	Estimated Exist. Hrs.	Annual kWh Saved	Estimated \$\$ Saved **	Simple Payback
1 HALLS / CORRIDORS	Install Ceiling Unit Occupancy Sensor	42	\$9,023.27	\$3,339.63	\$5,683.64	11.82	20	12,292.8	\$1,720.99	3.3
2	Install Ceiling Unit Power Pack	44	\$3,472.84	\$1,285.34	\$2,187.49					
3	Install Wall Switch Occupancy Sensor with Pla	4	\$282.19	\$104.44	\$177.75	0.66	20	686.4	\$96.10	1.8
4 HALLS / CORRIDORS	Install Ceiling Unit Occupancy Sensor	10	\$1,889.57	\$699.36	\$1,190.22	3.00	20	3,120.0	\$436.80	2.7
5	Install Ceiling Unit Power Pack	65	\$5,130.33	\$1,898.80	\$3,231.53					
6	Install Wall Switch Occupancy Sensor with Pla	18	\$1,269.84	\$469.99	\$799.86	1.56	20	1,822.4	\$227.14	3.5
7 HALLS / CORRIDORS	Install Ceiling Unit Occupancy Sensor	28	\$5,290.81	\$1,958.20	\$3,332.61	3.77	20	3,920.8	\$548.91	6.1
8	Install Ceiling Unit Power Pack	75	\$5,919.61	\$2,190.93	\$3,728.68	0.00				
9 HALLS / CORRIDORS	Install Ceiling Unit Occupancy Sensor	1	\$188.96	\$69.94	\$119.02	0.28	20	293.3	\$41.06	2.9
10 HALLS / CORRIDORS	Install Ceiling Unit Occupancy Sensor	56	\$10,581.61	\$3,916.39	\$6,665.22	42.15	20	43,838.1	\$6,137.33	1.1
11	Install Ceiling Unit Power Pack	42	\$3,314.98	\$1,226.92	\$2,088.06					
12	Install Wall Switch Occupancy Sensor with Pla	8	\$564.38	\$208.88	\$355.49	0.97	20	1,006.7	\$140.94	2.5
13 HALLS / CORRIDORS	Install Wall Switch Occupancy Sensor with Pla	6	\$423.28	\$156.66	\$266.62	1.01	20	1,048.3	\$146.76	1.8
14 GYM	Install T5 Fixture Unit Occupancy Sensor	20	\$3,432.19	\$1,270.30	\$2,161.89	4.68	30	7,300.8	\$1,022.11	2.1
15 GYM	Install Wall Switch Occupancy Sensor with Pla	2	\$141.09	\$52.22	\$88.87	0.17	30	262.1	\$36.69	2.4
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
TOTALS:			\$50,924.95	\$18,848.00	\$32,076.95	70.07		75,391.7	\$10,554.84	3.0

APPENDIX C Project Viability

BUDGET / FINANCING

Please provide a complete accounting of the proposed budget for the project. Include project budget, cost estimates/quotes, sources of funding and financial/payback analysis. Please note that up to 10% of grant request may be used for administrative costs associated with the proposed project. The applicant must provide justification of any administrative cost in this section.

Project	Description	Expected Cost Savings (\$)	Expected Town of Sudbury Cost (\$)	Simple Payback (years)
Lighting Controls	Lighting Controls for common areas in the Sudbury Public Schools	\$38,423	\$84,560	2.2
HVAC Controls	HVAC Controls for selected equipment	\$12,045	\$39,250	3.3
Efficient Vehicle Purchase	Upgrade to Premium Efficiency Vehicle	\$1,050	\$8,240	7.8
Infrared Camera	Infrared camera for building inspections	\$375	\$4,188	11.2
Grand Total		\$51,893	\$136,238	2.6

APPENDIX D Projected Energy Impact

1) ENERGY EFFICIENCY 2) OTHER INNOVATIVE GREEN INITIATIVES

Please provide an overview of energy efficiency measures implemented municipality wide as well as at the specific site grant funds are sought for. Also, please share with us other innovative green initiatives your community has implemented.

The following sections provides a snapshot at previous energy reduction measures, current initiatives, potential measures to be considered within a future Energy Reduction Plan and resources that the Town of Sudbury may consider when creating an Energy Reduction Plan.

Past Efforts

- The Town took part in the DOER's Energy Audit Program to review the town hall, all of the schools, the police station, the Fairbanks Community Center, and the Flynn building (suggested central HVAC system).
- The schools have upgraded their automatic temperature controls, pumping systems, and lighting systems through the utility incentive programs in recent years.
- Two old boilers were upgraded in the Fairbanks Community Center through Keyspan's programs in 2004.
- Lighting in the DPW Garage and Flynn Building was upgraded in 2009 through NSTAR's program.
- Lighting in the senior center, public schools offices, and parks/recreation portions of the Fairbanks Community Center building was upgraded in 2004 through NSTAR's programs.
- Additional insulation was added to the Town Hall roof during a 2007 reroofing project.
- The Flynn Building boilers were upgraded in 2006 through Keyspan's programs.
- Ceiling insulation was upgraded at the Loring Parsonage in 2009.
- The police department purchased a hybrid vehicle in 2009.

Current Efforts

- The Town obtained an Energy Efficiency and Conservation Block Grant (\$141,864) from the DOER to install a solar DHW system and PV array on the Fairbanks Community Center building.
- The Town currently has a lighting upgrade proposal underway with NSTAR.
- The school department has a proposal to perform a \$140,000 lighting controls upgrade project through NSTAR.
- Street light fixtures are planned to be modified to use lower wattage lamps and ballasts, and an incentive is being sought through NSTAR.
- A capital request is in process to upgrade the heating system controls in the Fairbanks Community Center.
- MTC is providing funding for a 2 kW demonstration PV array on the Noyes School.

- The Energy and Sustainability Green Ribbon Committee is discussing potential plans for a large PV installation at the site of the former landfill.
- This April, the Town will be voting on a petition to replace the police station with a more efficient building that better meets the needs of the community.

APPENDIX E Projected Energy Impact

GREEN HOUSE GAS REDUCTIONS

Please provide your calculations for GHG and fossil fuel energy reductions related to the proposed project.

Project	Description	Expected Electric Energy Savings (kWh)	Expected Natural Gas Energy Savings (Therms)	Expected Natural Gasoline Energy Savings (gal)	Expected Energy Savings (MMBTU)	GHG Reductions (lbs CO2)
Lighting Controls	Lighting Controls for common areas in the Sudbury Public Schools	274,452			937	275,550
HVAC Controls	HVAC Controls for selected equipment	10,840	7,018		739	93,050
Efficient Vehicle Purchase	Upgrade to Premium Efficiency Vehicle			350	49	6,847
Infrared Camera	Infrared camera for building inspections		250		25	2,927
Grand Total		285,292	7,268	350	1,750	378,375

		lb CO2
Natural Gas	Therms	117.08 per MMBTU
Electric	Electric Energy	1004 per MWH
Vehicle Fuel	Gasoline	19.564 per gallon

Greenhouse Gas Factors

APPENDIX F Projected Energy Impact

ENERGY REDUCED BY FUNDS SPENT

Please calculate the amount of energy reduced by the funds proposed to be spent on the project.

Project	Description	Expected Electric Energy Savings (kWh)	Expected Natural Gas Energy Savings (Therms)	Expected Natural Gasoline Energy Savings (gal)	Expected Cost Savings (\$)
Lighting Controls	Lighting Controls for common areas in the Sudbury Public Schools	274,452			\$38,423
HVAC Controls	HVAC Controls for selected equipment	10,840	7,018		\$12,045
Efficient Vehicle Purchase	Upgrade to Premium Efficiency Vehicle			350	\$1,050
Infrared Camera	Infrared camera for building inspections		250		\$375
Grand Total		285,292	7,268	350	\$51,893

APPENDIX G

Projected Economic Development Benefit

Please provide evidence of job creation, job retention, market transformation or other economic development benefits associated with this project.

Project	Description	Expected Total Cost (\$)	Jobs Created
Lighting Controls	Lighting Controls for common areas in the Sudbury Public Schools	\$153,174	1.7
HVAC Controls	HVAC Controls for selected equipment	\$39,250	0.4
Efficient Vehicle Purchase	Upgrade to Premium Efficiency Vehicle	\$8,240	0.1
Infrared Camera	Infrared camera for building inspections	\$4,188	0.0
Grand Total		\$204,852	2.2

Notes

1. The Expected Total Cost is the actual project cost before utility incentive
2. \$92,000 per job created is assumed