

1.0 Program Title

Energy Cost and GHG Reduction

Fremont Safety Complex

Police, Fire & Rescue, and Emergency Mgt Building

Town of Fremont
425 Main Street
Fremont, NH 03044

1.2 Program Description

This project is an energy cost and greenhouse gas reduction program. The program effort is two fold. First, to provide enhanced weatherization with the placement of additional insulation (increased R value) throughout the building's ceiling envelope; and second to provide for an expandable solar photovoltaic system to provide a battery charging system to reduce dependence on conventional power.

This program is consistent with PUC 2604.01(c) and more specifically aligns with the following PUC specific program types¹:

item # 2:

"...Weatherization of NH residential housing and commercial building stock"

item #3

"...Energy efficiency related work force training and development"

item #7:

"...Programs to increase compliance with the building energy code"

item #8:

"...Programs to improve the electric and thermal energy efficiency of new and existing residences and commercial buildings"

item #10

Education, outreach and information programs that promote energy efficiency, conservation, and demand response.

¹as taken from GREENHOUSE GAS EMISSIONS REDUCTION FUND, REQUEST FOR PROPOSALS FOR PROGRAMS TO REDUCE GREENHOUSE GAS EMISSIONS IN NEW HAMPSHIRE and ISSUED FEBRUARY 23, 2008

1.3 Program Summary

This fast track, ready to go, cost savings program will reduce the annual operating energy cost of Safety Complex and will additionally provide for a visible outreach with the placement of a solar charging system on the Safety Complex roof.

The scope of the project is to provide rafter vents where needed, insulate each bay at wall plate, and add 10" of un-faced R30 insulation to all exposed ceiling areas. A total of approximately 3200 square feet of ceiling area will be insulated; and the remaining area of ceiling area will be weatherized and sealed for leaks. Part two of the project will place an expandable solar photovoltaic system on the roof for the purposes of generating electricity for charging of batteries within the apparatus bay of the safety complex.

This application is part of an overall comprehensive energy/greenhouse gas reduction effort undertaken by the Town of Fremont in 2007. A major part of this effort is to significantly reduce or eliminate fossil fuel usage in municipal activities and buildings; including the safety complex. In addition, a comprehensive electrical lighting audit has been performed by a PSNH contractor on all municipal structures, with a goal of retrofitting existing lighting with more energy efficient systems.

The overall goal is to reduce GHG emission by 80%+ by the year 2050, with an emphasis on maximizing reductions in the near term.

1.4 Low Income Residential Customer Qualification.

The program serves low income residential only to the extent of its' impact on cost savings and to those directly effected with the local tax burden.

1.5 Identification of Applicant Organization

Town of Fremont
295 Main Street
Fremont, New Hampshire 03044
603-895-3200

Contact for this proposal:

Bob Larson
Town of Fremont
295 Main Street
Fremont, New Hampshire 03044
603-895-4013
fremontbi@comcast.net

1.6 Identification of Subcontractors and Partners

Upon being awarded funding the project will go to bid with a not to exceed and fixed price equal to the estimated cost and the awarded dollar amount as propose by this request.

A bid has been received that supports the amount of this request. Those bid results and estimates are included herein.

1.7 Authorized Negotiator(s)

Thomas Roy, Building Official
Town of Fremont
295 Main Street
Fremont, New Hampshire 03044
603-895-3200
fremontbi@comcast.net

Bob Larson – Energy Commission
Town of Fremont
Main Street
Fremont, NH 03044
603-895-4013
larson.robert1835@comcast.net

1.8 Projected Energy Savings

The project will directly support energy savings with the reduction of annual fuel and electric cost savings (energy cost). It is estimated and projected that the heating fuel oil cost savings for this project will approach 15-17%, while the estimated and projected annual electrical cost savings for this project will approach 7-12%; this equates to a projected total energy savings of between \$73,550 to \$114,179 over a twenty year period.

Heating Oil Projected Cost Savings:

Energy saving in %	Annual Gallons Saved	Annual \$ Savings @\$3.50/gal	5 Year \$ Savings @4.50/gal	10 Year Savings @4.50/gal	20 Year Savings @4.50/gal
12%	443	\$1550	\$9966	\$19931	\$39,863
17%	627	\$2195	\$14108	\$28215	\$56,430

Electrical Cost Projected Savings:

7%	\$ 842.17	\$4,211	\$8,422	\$16,843	\$33,686
12%	\$1,443.72	\$7,219	\$14,437	\$28,874	\$57,748

Total Projected Savings

Lower projected savings 12% fuel + 7% electric	\$ 73,550
Higher projected savings 17% fuel + 12% electric	\$ 114,179

1.9 Projected Greenhouse Gas Emissions Reductions

The projected reduction in greenhouse gas emissions that should result directly from the proposed program is reflected below. This program results in GHG emissions reductions projected at between 344,453 pounds to 521,700 pounds; or nearly 260 tons of CO₂ emissions are removed from the atmosphere over the life of the program.

Fuel Oil GHG Reductions

Fuel Oil Energy saving in %	Annual Gallons Saved	CO ₂ emissions in lbs per gallon	Annual CO ₂ emissions in lbs.	5 Year Reduction in lbs.	10 Year Reduction in lbs.	20 Year Reduction in lbs.
12%	443	26	11,516	57,580	115,159	230,318
17%	627	26	16,302	81,510	163,020	326,040

Electrical Energy GHG Reductions

Electrical Energy Savings in %	Annual Watts Saved	CO ₂ emissions in lbs. Watt (1087/MW)	Annual CO ₂ emissions in lbs	5 Year Reduction in lbs.	10 Year Reduction in lbs.	20 Year Reduction in lbs.
7%	5250000	0.001087	5,707	28,534	57,068	114,135
12%	9000000	0.001087	9,783	48,915	97,830	195,660

Total Energy GHG Reductions:

Lower projected savings 12% fuel + 7% electric	344,453 lbs.
Higher projected savings 17% fuel + 12% electric	521,700 lbs.

(The values as provided in the RFP package were used to generate the projected reduction in greenhouse gas emissions as presented in the table)

1.10 Length of Program

Cost savings benefit of this program is for the life of the building and would be expected to exceed 20 years. The program would be in place within 180 days of funding and function throughout its' life.

1.11 Total Program Costs

Total project cost is: \$14,711.00	
Insulation and Weatherization	\$8960.00
Solar Photovoltaic	\$5751.00

1.12 GHGER Funds Requested

Funds requested from the GHGER Fund is \$11,135

2.0 Executive Summary

The Fremont Safety Complex houses the Police, Fire & Rescue and Emergency Mgt Departments for the Town of Fremont. The building was built in 1998. The Safety Complex also doubles as the Town's emergency shelter in times of natural disasters or other at times of other emergency events. The Safety Complex is an integral part of the community. The Safety Complex is used for many other purposes directly attended by the public. The facility's training room is regularly used by such organization as the Boy Scouts, Cub Scouts, Girl Scouts, and Brownies. It is used by other entities as a local meeting place for regularly held sessions.

The building construction methods used 10 years ago lacked emphasis on energy conservation and current knowledge of enhanced methods and focus on insulation (increased R values) and weatherization (overall tightness). The building heat loss is significant to the point of having to renovate the building a few years back with rooftop exhaust fans to cool the roof undersurface in an attempt to prevent massive ice build up due to snow and ice melting from heat loss (energy loss) through the ceiling areas. Subsequent evaluation of the building's insulation properties has resulted in this opportunity for energy conservation.

Approximately 2600 square feet of exposed ceiling area will be over-insulated (insulating over the existing work) with R-30 un-faced insulation. Rafter vents will be placed as required in each bay area and insulation in the area of the top wall plate will be insured and then the entire ceiling area will be sealed appropriately to minimize heat loss.

As a part two of this project an expandable solar photovoltaic panels will be placed on the large roof area of the complex. These panels will be connected to the electrical circuits utilized to charge batteries within the apparatus bay of the safety complex. While this effort, in and of itself does not provide for a significant return in dollars savings, it does provide for an immediate and visual queue to the public as awareness and outreach opportunities of alternative energy sources. The unit can be used as education and training relating to photovoltaic. It is expected that this can be the catalyst to spearhead support for other conservation efforts within the community.

While this project is neither complex nor technology driven, it is a means of providing for an immediate, project ready focus on energy savings and GHG reductions.

The overall cost of the project is estimated to be \$14,400. The Fremont Energy Conservation Committee, along with New England Grass Roots Environmental Fund has provided seed monies in the amount of \$1000.00 for this project. The Town of Fremont will provide \$3400 in funding and/or in-kind contribution.

3.0 Proposed Work Scope and Project Schedule

Due to immediate nature of this project and the limited size of the project the scope of the work and time frame are limited. It is perceived that upon receipt of funding for the project the following will play out:

- Receive and accept funds as requested from this project
- Fix the timeframe of the project to be less than 6 months
- Send out an RFP, with not to exceed bid price for this project
- Review the bids and award work locally
- Complete work and close funding project

The total project cycle from funding to completion will be less than 6 months.

4.0 Project Benefits

The program benefits can be reflected in the following:

4.1 Reduce greenhouse gas emissions from all fuels used to provide electricity, heating and cooling in New Hampshire;

From table in section 1.9; a projected reduction of up to 521,700 pounds or just over 260 tons of CO₂ emissions can be reduced with this project.

4.2 Be cost-effective;

From the table in section 1.8; a projected cost savings of up to \$114,000 over a 20 year life; more than 10 times the initial cost of the project.

4.3 Reduce New Hampshire's peak electric load;

The project will have a direct impact on electrical load to the degree of reduction as noted in table 1.8; or approximately 7-12% annual reduction. The project will also have a significant impact on the reduction of dependency of fossil fuels.

4.4 Promote market transformation;

The project fully supports the weatherization and of commercial buildings.

4.5 Promote innovative technologies

No new technologies are employed in this project; however the project does provide for utilization of one of the most effective means of utilization of existing practices with the improved weatherization through enhanced insulation of the building envelope.

In addition the project outward and visible placement of solar photovoltaic panels in support of alternative energy provides for immediate public awareness and education of such opportunities.

4.6 Promote economic development;

The project promotes economic development only to the degree of providing the spending stimulus specific to this project.

4.7 Promote energy cost savings;

Reduction in energy cost of 12-17% as projected in the annual energy cost for this building. See table 1.8.

4.8 Promote collaboration and provide useful information for future program evaluation and improvement; as the Fremont Energy Committee will utilize the opportunities presented by this program in educational awareness to general public and selected student bodies.

4.9 The program is consistent with the public interest and the purposes of RSA 125-O: 19.

5.0 Measurement and Verification

The Program can be measured with the comparative data of energy consumption (heating oil and electric) over any subsequent period.

6.0 Budget

See attached budget spreadsheet.

7) Applicant Qualifications

1. Thomas Roy – Building Official Town of Fremont (profile attached)
2. Bob Larson – Fremont Energy Committee (profile attached)
3. Fremont Energy Committee (profile attached)
4. Rich Goterch – Friedrich Carpentry Plus – provider/installer of weatherization and energy components.
5. Seacoast Energy Alternatives – provider/installer of photovoltaic system

Respectfully submitted by:

Robert Larson, Fremont Energy Committee, Chair

3/23/2009