

November 6, 2006

Don Wexler  
609 Dickerson Road  
Mooretown, Vermont 05660

Dear Don,

I'm writing to summarize my energy evaluation of the Moretown municipal buildings. The analysis is a two step process. First, I reviewed the energy use of the buildings and compared it to local averages. Comparing annual energy use intensities (EUIs) can show how the energy performance of your building compares to others. Usually expressed in kBtu/sf/yr, the EUI indicates the rate at which energy is used at your building. The second step was a site visit and building reviews on August 23, 2006. We looked at the building envelope, lighting and heating systems. This letter summarizes the building energy use, the site visit and includes possible efficiency upgrades that would reduce the buildings' energy consumption.

#### **Town Clerk's Office**

The town clerks office was built in 1958 and is about 1000 sq ft. The building is stick framed with a slab on grade foundation. The building is open for about 40 hours a week.

In 2005 the building used 275 gallons of propane and 5000 kWh. The EUI of this building is 78 kBtu/sf/yr. A rating system from Oak Ridge National Lab (ORNL) rates this buildings energy use as "average". That is good news. Your building doesn't use an outrageous amount of energy and the town must be doing something right maintaining and using the building. But that doesn't mean there aren't things that could be done to improve the situation. Below, I identify ways to reduce current energy costs

#### **Lighting**

The current T12 (1 ½ inch diameter bulb) linear fluorescent lighting on the first floor can be replaced with a new linear fluorescent fixture called "Super T8" (1 inch diameter bulb) lighting. If the current 6 T12 fixtures were replaced by Super T8 fixtures the town would save about \$40 a year in electric costs and Efficiency Vermont could offer about \$100 as a rebate if the lights were installed. The new lighting fixtures would also improve the lighting quality in the building. Enclosed is a document that lists the lamp and ballast combination that qualifies for the Super T8 rebate.

#### **Heating**

The heat is supplied by electric resistance heat and a direct vent propane heater. The heat is controlled by a manual thermostat. Even with rising fuel costs, electric heat is the most expensive way to provide heat. Turning up the thermostat that controls the propane heater would be more cost effective than using the electric heat. You may want also to consider installing a direct vent, high-efficiency unit heater to replace the electric heat. Even with installation costs, it's likely that this option is more cost effective than maintaining electric heaters.

The propane heater may have a built-in programmable thermostat, which I would recommend setting to turn the unit on during operating hours and off during unoccupied times. The electric heat should also be controlled by a programmable thermostat. The general rule for savings is for every degree you set the temperature back over an 8 hour period, you save one percent of your annual heating bill. Your savings will depend on the current operating schedule. Even if staff turns down the thermostats when they leave the building, there would be benefits from the

programmable model. By using a programmable thermostat you are guaranteed the savings and you can set it to turn the heat on before you arrive at the building which would improve your comfort and the increase in energy use would be negligible.

#### Envelope

There is blown in insulation in the attic. The insulation levels in the walls are unknown. The windows appear to be original and have storms. You may want to consider a full building energy audit and weatherization for this building, especially if you are having it done at the Town Hall. See the description of full building energy audit in the Town Hall section.

#### **Town Hall**

The Town hall is used as a community center and was built in 1835. The building is stick frame and approximately 4300 square feet. The building is used for meetings elections and for special functions when someone from the town rents the building.

In 2005 the building used 2400 gallons of oil and about 1800 kWh. The EUI of the building is 78 kBtu/sf/yr. This energy use is also considered average. There may be ways to reduce the energy use as identified below.

#### Lighting

The current T12 (1 ½ inch diameter bulb) linear fluorescent lighting on the first floor can be replaced with a new linear fluorescent fixture called "Super T8" (1 inch diameter bulb) lighting. If the current 14, T12 fixtures were replaced by Super T8 fixtures the town would save about \$40 a year in electric costs and Efficiency Vermont could offer about \$100 as a rebate if the lights were installed. The new lighting fixtures would also improve the lighting quality in the building.

#### Heating

The building is heated by 2 oil furnaces controlled by manual thermostats. The thermostats were set at 55 degrees when I was there. If the building isn't used in the winter, you may want to consider draining the pipes and turning the heat off.

#### Envelope

The building wall, foundation and attic insulation are not visible due to wall and ceiling construction, therefore it's difficult to know whether the building is sealed and insulated. You can save fuel and improve occupant comfort when buildings are properly weatherized. The first step to weatherize your building is to have a full building energy audit using advanced diagnostic techniques and equipment to pinpoint current air leakage and building insulation levels. Once the evaluation is complete, select a contractor to seal the leaks and increase insulation levels in the spaces that are the most cost-effective to improve. Full weatherization can save 15-30% on a building's annual fuel bill with an average of 22% savings.

#### Kitchen,

The refrigerator in the kitchen was empty and plugged in. This refrigerator likely costs between \$200 and \$350 a year to operate. You may be able to save some energy and money if it was turned on and off as needed for events in the building.

#### **Library**

The library is about 1200 sq ft and was built about 100 years ago. The building is stick framed residential construction with a relatively new foundation. The building is open approximately 10 hours a week.

In 2005 the building used about 700 gallons of fuel oil and 1400 kWh of electricity. The EUI of the building is 86 kBtu/sf/yr. The EUI of this building is also considered average.

#### Lighting

The lighting is incandescent fixtures. You should consider replacing the existing incandescent bulbs with compact fluorescent bulbs. Each bulb can save about \$8 a year in operating costs.

#### Heating

The heat is an oil fired furnace controlled by a manual thermostat. You may want to consider programmable thermostats. The general rule for savings is for every degree you set the temperature back over an 8 hour period, you save one percent of your annual heating bill. Your savings will depend on the current operating schedule.

#### Envelope

The building wall and attic insulation are not visible due to wall and ceiling construction, therefore it's difficult to know whether the building is sealed and insulated. If the building operating hours increase, I would consider a full building energy audit.

#### Fire Station

The fire station was built in 2004 and is 3400 sq ft. The construction is metal frame and the foundation is slab on grade. The building is occupied every other Tuesday for meetings and as needed for emergency calls.

The building uses about 1700 gallons of propane and 6000 kWh of electricity per year. The EUI of the building is 52 kBtu/sq ft. This is considered average to low energy use.

In general I don't have any recommendations for this building.

#### Municipal Garage

The garage is about 3200 sq ft and is used 50 hours a week.

In 2005 the building used 750 gallons of oil and 2900 kWh of electricity. The EUI of this building is 35 kBtu/sf/yr. The energy use of this building is considered low.

The only recommendation that I have for the garage is to change the existing T12 lighting to T5 (5/8<sup>th</sup> of an inch) high output fixtures or Super T8 high ballast factor fixtures. If you are interested in pursuing a lighting upgrade for the garage I can explore each option more in depth to determine which option is most cost effective for the town.

#### NEXT STEPS:

There are several opportunities for Moretown to save money on operating costs through reduced energy use.

If the town wants to replace the lighting and has the funding to do so, the next step would be to get an electrical contractor in to get their opinion on what type of lighting should be installed in all of the buildings and to get an estimate of the costs. If the town does not have the funding for the lighting, there may be a way to lease the fixtures and pay for the lease cost through the energy savings. If you are interested in leasing, please let me know and I can provide more information.

Programmable thermostats can be purchased at most hardware stores. Make sure you get a model that has at least 2 program settings, Monday - Friday and then Saturday - Sunday. Some models have 7 day programmable capabilities which may be useful for buildings like the library and fire station.

If you would like to pursue building weatherization you can speak with Central Vermont Community Action Council which does both the full building energy audit and weatherization (air sealing and insulation). They are located in Berlin and their phone number is (800) 639-1053.

There are also for profit weatherization companies. If you would like a list of those companies, please let me know.

Please let me know how I can help you with any next steps to reduce Moretown's energy consumption. I am available to present this report to your selectboard and assist you with calculations on cost effectiveness of the projects in order to prioritize which options to pursue. I can also refine the estimated incentives to let you know exactly how much you can expect in a rebate from Efficiency Vermont once the scope of your projects are determined.

I can be reached at Ahollingsworth@veic.org or 802.522.5519. I will be going out on maternity leave from the end of November 2006 to March 2007. There will be alternative contact information left on my voice mail for that period of time.

Sincerely,

Alison Hollingsworth

ENC:  
2006 Lighting rebate form  
Super T8 fact sheet  
Municipal Energy Brochure  
Financing Brochure

CC:  
Susan Goodyear  
Town Clerk  
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