



Vermont Superintendents Association School Energy Management Program

April 19, 2005

David Hill
Charlotte Central School Board
408 Hinesburg Road
Charlotte, VT 05445

Subj.: Walk-through energy assessment, Charlotte Central School.

Thank you for the opportunity to conduct a walk-through energy assessment with you, Dennis LaBonte and Bob Mason at Charlotte Central Elementary School. This walk-through was undertaken in our partnership with the Efficiency Vermont schools initiative. A summary of findings follows.

Heating System Fuel Choice.

The school utilizes No. 2 Fuel Oil for space heating purposes. The building is 47,036 sq. ft., and this fuel type is the cost-effective choice for the school. While wood chip heat is cost-effective for larger schools, a building area of 50,000 sq. ft. seems to be the minimum practical size for this kind of heating system to be economic.

Heating System Controls.

It may be appropriate to plan for the eventual conversion of the remaining pneumatic heating system controls to electronic, to match the controls in the newer section of the building.

Service Water Heating.

There is an electric water heater located in the boiler room. Especially since an alternate fuel source is available at that location, a stand-alone or instantaneous fuel oil fired water heater should be considered. At current prices, fuel oil heats water for about one-third the energy cost of electricity. Propane would be a second choice, as propane heats water for about two-thirds the cost of electricity. If the school decides to proceed with this change, please contact Efficiency Vermont to find out if efficiency incentives would apply.

Lighting System.

Most of the building utilized energy-efficient T-8 style fluorescent lighting. There are, however, some remaining lighting upgrade opportunities in the building.

Lighting in the Cafeteria and Kitchen is currently the older T-12 type. Upgrading to T-8 lighting would yield significant energy and cost savings. In addition, switching and controls could be updated at the time of a lighting upgrade to further reduce the hours of operation of these lights. Control options could include locking out some of the lighting, and perhaps utilizing occupancy sensors.

Lighting in the boiler room is also the T-12 type, and should be considered for conversion to T-8 at the same time.

Lighting in the Multi-Purpose Room currently consists of 400-watt Mercury Vapor fixtures. Many schools are now utilizing T-5 fluorescent fixtures in Multi-Purpose Rooms and Gymnasiums. T-5 fixtures would provide the same amount of light for less energy and cost, and they also would be “instant on,” whereas the existing Mercury Vapor fixtures require a warm up period. It would be possible to utilize occupancy controls with a T-5 lighting system. In the stage area, I recommend that you consider fluorescent lighting for everyday use, and lockout controls on the theatre lighting so it can be used only with proper authorization.

The Library also utilizes Mercury Vapor fixtures in an indirect lighting configuration. New direct/indirect T-8 fixtures would likely be a good upgrade strategy for this space, and would significantly improve the quality of light. Efficiency Vermont has design assistance available.

The 70 x 100-foot Gymnasium also utilizes Mercury Vapor fixtures. This space also is a candidate for a T-5 lighting upgrade.

In hallways and other spaces, you may wish to consider occupancy sensors. In the gym entry, art room, and other areas where daylight is present, photocell controls for lighting can optimize the use of energy.

The standard for light levels in classrooms, libraries, offices, and other areas where instruction or reading occurs is 50 foot-candles illumination on the working surface. Hallways and other areas do not require this high a level of illumination. Reduction in illumination in these areas can potentially yield additional energy and cost savings.

While costs and benefits have not been calculated yet, I would suspect a five to seven year simple economic payback for these measures.

Just a reminder: if a combined renovation project of \$10,000 or more were developed, it is likely that the school would qualify for 30% State Aid for Construction reimbursement. For instance, a lighting component could be added to other eligible work to bring the project to the \$10,000 level. The minimum project cost for State Aid to apply is \$10,000. Please contact Cathy Hilgendorf at (802) 828-5402 for details.

Kitchen.

There is an electric booster water heater located in the kitchen. We recommend that, at such time as the unit fails, that a propane fired booster be considered. There is already a propane source in the kitchen, and propane heats water for about two-thirds the energy cost. However, I can not recommend an immediate change due to economics.

At such time as any refrigerators are considered for replacement, we recommend that Energy Star-rated units be specified.

Gymnasium and Multi-Purpose Room Ventilation Controls.

There is an opportunity for demand control of the ventilation systems in these larger spaces utilizing CO2 sensor

controls. In this way the ventilation system can be automatically controlled to match room occupancy requirements.

Air Conditioner in EEE Room.

The air conditioner in the EEE room seemed to lack proper sealing. Also, at such time as this unit needs to be replaced, we recommend that an Energy Star-rated unit be specified.

Vending Machines.

The Vending Miser device qualifies for incentive payment from Efficiency Vermont, and cuts the annual electric consumption of a typical vending machine by half.

Bus Heater Timers.

There is an opportunity for significant energy savings at the bus garage. Block heaters for school busses can be controlled so they are energized three hours or less prior to start. This eliminates overnight energy use. BFA – Fairfax has recently completed a timer installation for their bus block heaters. Please feel free to call Lyall Smith, Maintenance Director, (802) 849-6711 for details.

Kiln Operation.

If the operation of the 11,000 watt kiln can be restricted to other than normal school hours, it will cost less to operate. If the kiln operates during regular schools, the 11 KW will add to the school's billing peak. By deferring this demand to other hours, the fiscal impact on the school's bill will be significantly less.

Pole Mounted Exterior Lights.

Not included in our discussion inside the building was the opportunity to replace the existing pole mounted exterior rental lights with area lights mounted on the side of the building. We suggest that the school consider if building mounted lights would provide the lighting coverage desired. If so, it would be substantially less expensive to operate building mounted fixtures on the school's meter as opposed to the monthly rental for the pole mounted lights.

Installation of any of the above mentioned efficiency measures.

When the school considers any of the above measures, please contact either Efficiency Vermont or my office to determine if design assistance is available, and if efficiency incentives are likely to apply.

This concludes my report. Please feel free to contact me with any questions you may have.

Sincerely,

Copy: Sheryl Graves, Efficiency Vermont.