

**Superior-Greenstone District School Board
Plant Services Department**

Energy Conservation Plan

Energy management has become very important and necessary in order for the Board to minimize the cost of energy needed to operate the schools. Savings that are made in energy costs will then lessen the burden on the funding that the Superior-Greenstone District School Board receives.

A strong commitment on the part of the Board, administration, staff, and students, is key to an effective energy plan. Successful energy conservation can only be successful with the support and assistance of each building user.

This energy conservation plan is a living document which plots the path to be followed in creating a successful energy plan with supporting documents and policies. The plan will be updated as new technology comes into existence, and as best practices are identified.

In accordance with the Ontario Green Energy Act, the Superior-Greenstone District School Board energy plan will focus on:

- Consultation with building users and other stakeholders.
- Management of energy and water consumption
- Reduction of the emission of pollutants into the environment by reducing the carbon footprint of each school.
- Tracking and comparing energy use year by year
- Identification of successful activities
- Communication to staff, students, and other stakeholders

A) Current Energy and Water Waste Reduction measures in place:

The Plant Services Department has been involved in energy conservation for many years. Some of the measures already in place include:

Heating, Cooling and Ventilation

- Acceptable classroom and workspace thermal conditions are maintained through mechanical heating ventilation, natural heating, ventilation, or other means as appropriate.
- Thermal environmental conditions for human occupancy are currently targeted at:
 - 1) Building heating system target temperature = 19-24 C
 - 2) Building cooling system target temperature = 24 C or below

- Building Unoccupied Hours: Outside of normal operating hours, building systems are, where equipped, automatically set back and optimized for energy conservation. This differs between buildings but generally targets are set to be:
 - 1) Set-back room temperature = 15C.
 - 2) Fan forced ventilation is turned off on a schedule, or via occupancy sensors.
 - 3) Exhaust fans are turned off manually, or via timers.
 - 4) Classroom scheduling allows for a warm up period prior to student arrival.

Demand Control

- Where buildings are billed under a demand consumption meter, measures should be investigated and strategies drawn up to minimize the impact of moments of high energy demand (consumption).
- Concepts explored and implemented might include: Load shedding, supply priorities, load rotation (blackouts to low priority loads).

Time of Day Consumption

- Where buildings are billed under a time of day meter, measures should be investigated and strategies drawn up to minimize the use of energy during the high cost periods.
- Strategies might include: Preheating of buildings prior to start of higher energy cost period, energy storage systems, generators, or windmills.

Lighting

- Light Levels in rooms and buildings are set in accordance to the Ontario Building code.
- Where possible exterior natural light is used to supplement or in place of artificial lights (daylight harvesting).
- When light bulbs are replaced, they are replaced with energy efficient wattage bulbs or LEDs.
- The use of dimmable fluorescent ballasts, or dimmable LED devices, is becoming more common in spaces, such as video conference rooms, where the use of the room sometimes required adjustable lighting. Offices are also being considered as well.
- Lights are controlled by automatic sensors in many gymnasiums and classrooms, and turn off automatically when a room is left unoccupied.

Water

- School staff currently assists with the reduction of water waste, by informing custodial staff and the maintenance department of any plumbing leaks.

- Water meter readings are recorded in schools to ensure that unusual elevated consumption rates are caught and reported for follow-up by the Plant Maintenance Department. Most recently, interval meters have been put in place to track real time water consumption and outline elevated consumption.
- Lawn sprinklers systems are used in accordance to municipal bylaws.
- Automatic sink tap sets have been installed in many schools. This helps save water, and has the added benefit of reducing the transmission of germs due to the non-contact operation of the taps.
- Automatic flush valves have been installed in many schools through capital upgrades.

Information Technology

- The IT Department sets power saver settings to maximize energy savings on computer installations. Password levels are maintained to ensure the power-saving settings are not compromised.
- Where practical computers and ancillary electronic equipment (e.g. printers) are turned off when not in use.

Other

- Some vending machines have been put on timers to save energy over evenings and weekends.
- Energy efficiency is taken into account in the design of new building projects and during any refurbishment.
- Energy efficiency is considered in the purchase of new equipment, or implementation of new cleaning processes.
- Energy efficiency opportunities are reviewed during the annual Plant Budget preparation process.

B) The Consultation Process:

Over the school year, consultation will take place between the Plant Department and various employee groups, students, and other building users to formulate a list of actions that are both energy saving and practical in a school environment.

Some of the topics to be discussed and studied are as follows:

- 1) Development of an Energy Efficiency Policy for SGDSB
- 2) Efficient use of space required for school programming
- 3) Space not needed for classroom use or other school program (locked, lights off, heating and ventilation turned down)
- 4) Fume hoods (closed, exhaust fans off) when not in operation
- 5) Portable heaters or air conditioner units
- 6) Dressing for the season
- 7) Blinds and drapes on windows

- 8) Scheduling use of classrooms and other spaces to reduce energy consumption
- 9) Schedule classes to maximize the utilization of classroom space in the school;
- 10) Movements of students and staff in and out of the school, and door hardware to minimize heat loss, using door closers, etc.
- 11) Establish a resource center for energy education in schools
- 12) Communication to parents and other groups about school energy conservation efforts
- 13) After hours limited lighting to perform work safely
- 14) Refrigerators, microwaves, and coffee makers in schools.
- 15) Classroom air supply and return grills
- 16) Classroom doors and windows closed when the heat or air conditioning is on
- 17) Close windows and doors when leaving the classroom at the end of the day
- 18) Turning off unused machines. (Calculators, computers, display lights) Thermostat covers, damaged or faulty thermostats, and other equipment that may be malfunctioning.
- 38) Identification of over-heated and over-cooled areas
- 39) Verify lighting controls are operational where applicable
- 40) Isolation of unoccupied spaces from heating and cooling systems;
- 41) Proper thermostat settings and functions
- 42) Keeping ceiling tiles in place
- 43) Building insulation, caulking and weather-stripping.
- 44) Keep refrigerator compressors and condensers clean
- 45) Plumbing leaks
- 46) Hot water heater set points for washrooms and food preparation areas
- 47) Students involvement in monitoring energy usage
- 48) Establishment of a student energy patrol (elementary or middle school) or a student energy commission (middle or high school) to help monitor school energy use.
- 49) Provide for an energy waste reporting process with possible reward program
- 50) Student involvement and opportunity to learn energy savings skills that can be used at school and at home

C) Goals and Targets (5 Year Plan):

- See Appendix A: 5 Year Energy Action Plan
- All items in the Energy Action Plan are subject to funding being available to carry out the work.

D) Plan Updates:

This plan will be reviewed and updated as required by the Plant Department.

Appendix A: 5 Year Energy Action Plan

| Target Year | Description | Action Department |
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| 2015 | Use of online energy management systems, interval meters, and utility consumption database to track energy and water consumption. | Plant Dept |
| 2015 | Historic data will be compared from year to year to verify savings and develop budgets for energy needs for the coming years. | Plant Dept |
| 2015 | Make energy consumption data, on a school by school basis, available to the schools upon request, to assist with their energy based programming for children. | Plant Dept |
| 2015 | Consider energy efficiency in capital planning and focus on low-performing schools to identify the highest need for energy-efficient equipment and systems. | Plant Dept |
| 2015 | Consumption will be monitored carefully and any unusually high usage or billings will be investigated and corrected. | Plant Dept |
| 2015 | Continue with the ongoing conversion of light fixtures to energy efficient units, when renovation projects provide opportunity to do so. | Plant Dept |
| 2015 | Review schools for demand control costs and compile a demand control program, utilizing load shedding steps, and develop a cost estimate to level out demand costs, based on priority and potential savings per dollar invested. | Plant Dept |
| 2015 | Reduce overall energy consumption by 1%. | All |
| 2016 | An Energy Efficiency Policy will be created to map out the will of the board to save energy, and the methods to do so. | Plant Dept with Board Admin |
| 2016 | Maintenance Coordinator will provide annually each fall, a review and report on changes that might be needed to the multi-year energy saving plan to the Manager of Plant Services. | Plant Dept |
| 2016 | School and office based vending machines shall be put on timers, or other energy control devices, to save energy over evenings and weekends. | Plant Dept |
| 2016 | Implement demand control program Phase 1, to investigate and implement demand controls and programming to reduce costs due to demand on high energy use buildings | Plant Dept |
| 2016 | Implement school curriculum programming to raise awareness of energy use and savings to students of all grade levels, where practical and appropriate. | Education Dept |
| 2016 | Reduce overall energy consumption by 1%. | All |
| 2017 | Carry out annual preventative maintenance inspection, or failure notification follow-up, of all large area automatic lighting controls to ensure they are functioning as designed. | Plant Dept |

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| 2017 | Installation of LED stage lighting system in school stage areas to replace old high wattage Par64, Par56, and other stage light fixtures. Replace high amp dimmer systems with modern DMX controlled LED. | Plant Dept |
| 2017 | Conversion of all heating systems utilizing fossil fuels to a greener, highly controllable, and more energy efficient type. | Plant Dept |
| 2017 | Implement demand control program Phase 1, to investigate and implement demand controls and programming to reduce costs due to demand on high energy use buildings | Plant Dept |
| 2017 | Create a Wellnet type training program and have all Plant Dept staff complete the training to bring awareness to the need to save energy in school and office buildings. | Plant Dept |
| 2017 | Reduce overall energy consumption by 1%. | All |
| 2018 | Implementation of a full blackout program for evenings, after hours, and weekends. | Plant Dept |
| 2018 | Create an energy committee with various stakeholders to do inspections and make recommendations | Plant Dept |
| 2018 | Complete the conversion of every light fixture to LED, T8, T5, or other high efficiency type. | Plant Dept |
| 2018 | Implement remote monitoring and energy related alarms on mobile phones or other appropriate devices to notify Plant Dept staff and managers if there are energy waste situations occurring outside of preset parameters. | Plant Dept |
| 2018 | Extend the Wellnet training program and have all board staff complete the training to bring awareness to the need to save energy in school buildings. | Plant Dept with Board Admin |
| 2018 | Reduce overall energy consumption by 1%. | All |
| 2019 | Extend the Wellnet training program and have all students & staff complete the training to bring awareness to the need to save energy in school buildings. | Education Dept |
| 2019 | Installation of monitoring system to generate alarms when unusual energy consumption occurs that is outside of the normal usage historic data. | Plant Dept |
| 2019 | Water meter readings are recorded in schools to ensure that unusual elevated consumption rates are caught and reported for follow-up by the Plant Maintenance Department. Most recently, interval meters have been put in place to track real time water consumption and outline elevated consumption. | Plant Dept |
| 2019 | Install alternative energy generating systems (Micro-fit or equivalent) to feed power back into the grid, or into the schools directly for use on site. | Plant Dept |
| 2019 | Investigation of the removal of all circulating water heating and cooling systems and replacement with direct heat or cooling coil systems, where feasible. | Plant Dept |

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| 2019 | Maximizing recovery of heat or cooling from exhaust air systems using economizers, heat recovery units, or other available technology. | Plant Dept |
| 2019 | Implement a reward program that recognizes innovative energy saving ideas from staff and students. | Plant Dept in conjunction with the Education Dept. |
| 2019 | Ensure that where new buildings are constructed, or major renovations take place to existing building, that electrical devices which use energy are grouped together on smart electrical panels which provide a high level of individual control and time of day function for blackout capabilities. Examples include but are not limited to: Electrical panels for parking plugs in parking lots, lighting panels, classroom power outlet panels, computer rooms, etc. This would permit power to be turned off with minimal/no effect on essential services, which would also be on an essential service power supply. This would also make it easier to have transfer switches to introduce alternate energy sources when available or when needed. | Plant Dept |
| 2019 | Investigate and develop a zero grid energy status approach to buildings that are not open (evenings, weekends, school breaks, etc) to bring energy draw, from the grid, as near as practical to a zero net consumption state. This may include storage battery, wind, and solar power supply systems to replace energy normally used from the grid. | Plant Dept |
| 2019 | Reduce overall energy consumption by 1%. | All |