

Five Year Conservation and Demand Management Plan 2013/2014-2017/2018



Prepared June 2014 by:





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1 EXECUTIVE SUMMARY

The Ontario Provincial Government has committed to help public agencies better understand and manage their energy consumption. As part of this commitment, **Ontario Regulation 397/11** under the **Green Energy Act 2009** requires public agencies, including municipalities, municipal service boards, school boards, universities, colleges and hospitals, to report on their energy consumption and greenhouse gas (GHG) emissions annually beginning in 2013, and to develop and implement energy Conservation and Demand Management (CDM) Plans starting in 2014.

The purpose of the District School Board of Niagara (DSBN) Energy Conservation and Demand Management Plan is to develop a framework for District School Board of Niagara to understand the historical impact of its operations on greenhouse gas (GHG) emissions, and to take action by setting GHG reduction targets. The first objective of this report was the development of an energy Conservation and Demand Management Plan that addressed the facets of energy consumption in the School Board. This included the development of a GHG emissions inventory, benchmarking District School Board of Niagara's existing energy intensity performance relative to other School Boards, identifying potential energy efficiency projects, and establishing a GHG emissions reduction target. This strategic approach to energy management ("energy Conservation and Demand Management Plan") supports the District School Board of Niagara's **Strategic Plan**.

Energy efficiency and the wise use of energy are two of the lowest cost options for meeting energy demands, while providing many other environmental, economic and social benefits, including reducing greenhouse gas (GHG) emissions, cost avoidance and savings. Along with the aforementioned benefits, energy efficiencies and the wise use of energy also promote local economic development opportunities, energy system reliability, improved energy supply security, and reduced price volatility.

There are a variety of low cost/no cost initiatives available to District School Board of Niagara, which can jump-start energy consumption and dollar savings. Simple actions such as turning lights and appliances off, shutting off chillers in the summer, establishing efficient usage times, efficient production requirements, and many other actions can result in energy savings. Such actions, along with energy efficient capital and operating process improvements and project implementation, are key components which are outlined within the energy Conservation and Demand Management Plan (CDM Plan).

This CDM Plan is the culmination of a non-linear process involving the:

- Integration of establishing a baseline for performance to be measured against,
- Setting of future performance goals and objectives,
- Continuous improvement through identification of energy conservation potential,
- Strategic alignment of measure implementation and fiscal constraints, and

- Evaluation, measurement and communication of results achieved.

This CDM Plan contains three perspectives: historical, current and future. It looks at “what we have done”, “what we are doing”, and “what are we planning to do”.

2 KEY COMPONENTS

The Big Picture

Sustainability is a concept which meets the needs of the present without compromising the ability of future generations to meet their own needs. This is sometimes referred to as the “triple bottom line”.

- Environmental Sustainability: Managing the effects of human activity so that it does not permanently harm the natural environment.
- Economic Sustainability: Managing the financial transactions associated with human activities so that they can be sustained over the long term without incurring unacceptable human hardship.
- Social/Cultural Sustainability: Allowing human activity to proceed in such a way that social relationships between people and the many different cultures around the world are not adversely affected or irreversibly degraded.

An energy Conservation and Demand Management Plan is the sum of measures planned and carried out to achieve the objective of using the minimal possible energy while maintaining the comfort levels (in offices or dwellings) and production rates (in factories). It can be applied to any process or building where energy use is required. To make an efficient use of the energy and, as a consequence, to save it, the actions are focused on:

- Energy Conservation,
- Energy Recovery,
- Energy Substitution,
- Corporate Goals and Objectives, and
- Corporate Fiscal Management.

Analysis and Benchmarking

It is important to recognize the value of benchmarking and comparison as a starting point. By examining DSBN’s current energy consumption patterns and comparing them with others, a better understanding of the opportunities and the pitfalls of energy conservation and sustainability planning as experienced by other public agencies is gained. This exposure, combined with the information gleaned from the energy audits, will allow DSBN to focus on strategies that have been proven successful elsewhere and can be tailored to the unique nature of our School Board.

It is apparent that energy conservation is being considered and implemented in most Public Sectors across Ontario and Canada. As well, the insights gained through their experiences with energy conservation can be used as a springboard to further the DSBN’s sustainability strategies to encompass both operational and policy improvements. Many public agencies are taking their understanding of environmental issues

and conservation beyond energy consumption and recycling, by addressing the more complex issues of water management, heat island effect, and light pollution, to name a few.

Regulatory Requirements

Under Ontario Regulation 397/11 (Part of the **Green Energy Act**, 2009), all public sector agencies must now comply with mandatory reporting requirements. By 2013, all energy consumption at School Board facilities will have to be recorded and submitted to the Ministry annually. By 2014, the requirements become more stringent as School Boards will have to submit a CDM Plan, which encompasses measures taken to date with results, as well as a five year plan for further energy conservation measures to be implemented. DSBN is well positioned to meet this requirement as audits have been completed at most facilities, resulting in a compiled list of energy reduction projects, some of which are already implemented. The full list is reviewed throughout this Plan while the implementation program is outlined later in this report. This Plan itself is meant to serve as DSBN's CDM Plan and will help assist DSBN to meet all of its mandatory reporting requirements.

It is important to note that the energy conservation projects selected may change dependent upon additional findings from future energy audits, fund availability changes and changes to available incentives.

Key Factors and Constraints

It is important to both DSBN's future and to its image in the public at large to understand the value of a comprehensive CDM Plan. Many people around the world are beginning to embrace the notion that the earth's environment and precious resources need to be conserved. However, the necessary changes will not happen overnight. To be successful, a comprehensive energy management plan should embrace long-term thinking, taking advantage of "low hanging fruit" to achieve immediate cost savings which will be redirected to more complex projects involving higher initial costs with larger net benefits.

Public agencies should realize that each of their circumstances is unique and may not lend themselves to 'boiler plate' solutions used in many private sector segments. Those who have met their goals have utilized the advantages of the unique physical and non-physical attributes of their facilities, including green power generation on large flat roofs and community gardens on their large properties. While it is easy to be focused on the larger solutions, even seemingly small efforts can make a major long-term impact on the overall goal. A good example of this is Energy Awareness training which encourages staff to take simple and effective actions such as turning off lights and computers when not in use.

Ongoing professional development is also a key factor in the success of a CDM Plan to ensure that staff members understand their role in the greater goal. The CDM Plan and accompanying education should be a required part of their daily activities.

While realities of budget restrictions are an important consideration in any planning activity, it is possible to achieve energy savings while adhering to the financial constraints of a publicly-funded School Board system. It is clear that new technology and ideology changes have produced continued operational cost reductions while improving indoor comfort and environmental sustainability. These cost saving projects can often fund themselves by avoiding the use of previously allocated funds. As long as the savings are reinvested, these improvements can continue for the foreseeable future, ensuring a sustainable process. Many industries have had environmental programs running for over a decade and continue to hit their 3%-5% intensity reduction goals without sacrificing product quality.

3 HISTORICAL ENERGY MANAGEMENT

Historically, DSBN has addressed Energy Conservation and Demand Management on a project-by-project basis through the activities of the Facility Services Department. Capital projects were implemented based on equipment's expected useful life or in response to equipment emergency breakdowns. Utility savings, realized as a result of the implementation of these individual projects, have not historically been uniquely reported formally, but have been considered as a component of general operations. Sustainability and long-term energy reduction goals, through this CDM Plan, will become integral components of the business reporting system.

Utility costs were viewed as a fixed overhead cost. The management of these costs relied on an exception-based investigation approach. In other words, utility costs were only reviewed if a utility bill was much higher, or lower, than typical.

In 2014, DSBN will embark upon a strategic energy auditing project. The purpose of these audits will be to identify and analyze potential energy conservation and demand management opportunities. These efforts will be instrumental in assisting DSBN in aligning the CDM Plan with the School Board's **Strategic Plan**.

2011/2012 Energy Reduction Projects Summary	
Action	Facilities
Ballast Roof replacement	Ross PS, W.E. Brown PS
Chiller Plant replacement	Jeanne Sauvé PS
Classroom Lighting upgrade	Cherrywood Acres PS, Heximer Avenue PS, James Morden PS, McKay PS, Prince Philip (Niagara) PS, Riverview PS
Cooling Plant upgrade	Laura Secord SS, Sir Winston Churchill PS, DSBN Academy PS
Electrical System upgrade	Glynn A. Green PS, John Marshall PS, Laura Secord SS, Lockview PS, Westlane PS
Elevator	E.I. Crossley PS
Exterior Door replacement	Applewood PS, Caistor Central PS, Cherrywood Acres PS, E.W. Farr PS, Glynn A. Green PS, Gracefield PS, Gordon PS, Heximer Avenue PS, James Morden PS, John Marshall PS, McKay PS, Pine Grove PS, Plymouth PS, Riverview PS, Simcoe Street PS, South Lincoln PS, Westdale PS
Heating Plant replacement	Richmond Street PS
Heating System upgrade	Fitch Street PS, John Marshall PS, McKay PS
Lighting retrofit	E.I. Crossley PS, Garrison Road PS, Orchard Park PS, Ridgeway-Crystal Beach SS, Stamford Collegiate, Westdale PS
Plumbing upgrade	Riverview PS, Sir Winston Churchill PS
Roof replacement	Centennial SS, E.I. Crossley SS, Eden SS, Grimsby PS, Jacob Beam PS, Sheridan Park PS, Smith PS, Stamford Collegiate, W.E. Brown PS

2011/2012 Energy Reduction Projects Summary

Action	Facilities
BAS Controls upgrade	Applewood PS, Connaught PS, E.I. McCulley PS, Edith Cavell PS, Garrison Road PS, Governor Simcoe PS, Grapeview PS, Greendale PS, Grimsby SS, James Morden PS, Lifetime Learning Centre, Martha Cullimore PS, Nelles PS, Ontario PS, Parnall PS, Pine Grove PS, Port Weller PS, Power Glen PS, Prince Philip (Niagara) PS, Riverview PS, Senator Gibson PS, Stevensville PS, Thorold SS, Valley Way PS, Vineland PS
Window replacement	Garrison Road PS, Grimsby SS, John Marshall PS, McKay PS, Prince of Wales (St. Catharines) PS, Richmond Street PS, River View PS

2012/2013 Energy Reduction Projects Summary

Action	Facilities
Curtain Wall Replacement	E.L. Crossley Secondary School
Kindergarten Rooms Ventilation upgrades	Fitch Street PS, Gainsborough PS, Jacob Beam PS, Lakeview PS, Nelles PS, Oakwood PS, Port Weller PS, Princess Elizabeth PS, Ross PS, Winger PS
Electrical Upgrades	Centennial SS, E.L. Crossley SS, Eden HS, Gracefield PS, Laura Secord SS, Sir Winston Churchill SS, Westlane SS, Westmount PS, Steele Street PS, Cherrywood PS, Eastdale SS, Parnall PS, Governor Simcoe SS, James Morden PS
Ventilation Replacement	Central Public School Ross Public School
Exterior Door Replacement	Applewood PS, Caistor Central PS, Glynn A. Green PS, Jordan PS, McKay PS, Plymouth PS, Richmond Street, DSBN Academy
Lighting Retrofits	Lakeview PS, Sir Winston Churchill SS, Cherrywood Acres PS, Sir Winston Churchill SS, Stamford Collegiate, River View PS, James Morden PS, McKay PS, Prince Philip PS(NF), EL Crossley SS, Westlane SS
Heating Plant Upgrades	Princess Margaret PS, Smith PS, Woodland PS, Thorold SS, College Street PS, South Lincoln HS, Princess Margaret PS, Smith PS, Eastdale SS, Thorold SS, Woodland PS
Window Replacement	Westdale PS, Nelles PS, DeWitt Carter PS, Eden SS, Thorold SS, Plymouth PS, Centennial SS, Eden SS, Governor Simcoe SS, Stamford Collegiate, Stevensville PS, River View PS, Grimsby SS
Building Automation System Improvements (BAS)	Westlane SS, James Morden PS, Pine Grove PS, Prince Philip PS (NF), River View PS, Grapeview PS, McKay PS, Governor Simcoe SS
Chiller Replacements	Laura Secord SS, Sir Winston Churchill SS, West Park SS, Kernahan Park SS

2013/2014 Energy Reduction Projects Summary

Action	Facilities
Window Replacement	Connaught PS
Auditorium Roof-top Vent Unit Replacement	Governor Simcoe SS
Air Handling Unit Replacement	Laura Secord SS, DSBN Academy, Jeanne Sauvé PS
Ventilation Unit Replacements	Pine Grove PS
Ventilation Unit Upgrades	Fitch Street PS, Plymouth PS
Heating Plant Upgrade	William E. Brown PS
Electrical Service Upgrades	AK Wigg PS, Dalewood PS, Ontario PS
Lighting Retrofits	Carleton PS, Central PS, Cherrywood Acres PS, Lockview PS, Eastdale SS, DSBN Academy
Kindergarten Rooms - Ventilation Upgrades	AK Wigg PS, Caistor Central PS, EW Farr PS, John Marshall PS, Lockview PS, Martha Cullimore PS, Prince Philip PS (St. Catharines), Quaker Road PS, Smith PS, Steele Street PS
Data Centre Equipment Upgrade	Education Centre

4 CURRENT STATE OF CORPORATE ENERGY

Energy Data Management

While DSBN has an admirable history of managing its energy consumption, the Ontario government has required an increase in School Board energy management practices. This has resulted in the need to enhance current practices and develop new approaches. To meet this need, DSBN will design a comprehensive program for collecting and analyzing monthly energy billing information, and ensuring Staff is informed about energy consumption. This effort will produce an energy costs and consumption database that will be used for monitoring excessive variations, targeting facility follow-up evaluations, and highlighting areas that could be candidates for improved conservation. These monitoring enhancements will improve DSBN's understanding of the bottom line impact of energy management.

Energy Supply Management

DSBN has currently adopted a strategy of procuring its electricity from a number of Service Providers:

Electrical Energy Supply	
Service Provider	Facilities
Canadian Niagara Power Inc.	Bertie PS, Crystal Beach PS, DeWitt Carter PS, Fort Erie PS, Fort Erie SS, Garrison Road PS, General Vanier PS, McKay PS, Oakwood PS, Port Colborne HS, Ridgeway PS, Ridgeway-Crystal Beach HS, Rose Seaton PS, Steele Street PS, Stevensville PS
Grimsby Power	Central PS, Grand Avenue PS, Grimsby SS, Lakeview PS, Nelles PS, Park PS, Smith PS
Horizon Utilities	Alexandra PS, Applewood PS, Briardale PS, Burleigh Hill PS, Carleton PS, Connaught PS, Dalewood PS, E.I. McCulley PS, Eden SS, Edith Cavell PS, Education Centre, Ferndale PS, Glen Ridge PS, Governor Simcoe SS, Gracefield PS, Grapeview PS, Jeanne Sauvé PS, Laura Secord SS, Lincoln Centennial PS, Lockview PS, Maywood PS, Meadowvale PS, Memorial PS, Oakridge PS, Parnall PS, Pine Grove PS, Port Weller PS, Power Glen PS, Prince of Wales PS (St. Catharines), Prince Philip PS (St. Catharines), Queen Mary PS & St Catharines Collegiate SS, Sheridan Park PS, Sir Winston Churchill SS, St. Catharines Service Centre, DSBN Academy PS, Westdale PS, Woodland PS
Hydro One Networks Inc.	E.L. Crossley SS, E.W. Farr Memorial PS, Glynn A Green PS, Ontario PS, Pelham Centre PS, Prince of Wales PS (Thorold), Richmond Street PS, St. Johns Outdoor Centre, Thorold SS, Westmount PS, William E Brown PS, Winger PS
Niagara Peninsula Energy	A K Wigg PS, A N Myer SS, Beamsville District SS, Caistor Central PS, Campden PS, Cherrywood Acres PS, College Street PS, Forestview PS, Gainsborough PS, Greendale PS, Heximer Avenue PS, Jacob Beam PS, James Morden PS, John Marshall PS, Jordan PS, Kate S. Durdan PS, Maple Grove PS, Martha Cullimore PS, Orchard Park PS, Prince Philip PS (Niagara Falls), Princess Margaret PS, River View PS, Senator Gibson PS, Simcoe Street PS, South Lincoln HS, Stamford Collegiate SS, Valley Way PS, Victoria PS, Vineland PS, Westlane SS

Electrical Energy Supply	
Service Provider	Facilities
Niagara-on-the-Lake Hydro	Crossroads PS, Parliament Oak PS, School Support Services, St Davids PS, Woodend Environmental,
Welland Hydro	Crowland Central PS, Empire PS, Eastdale SS, Fitch Street PS, Glendale PS, Gordon PS, Mathews PS, Plymouth PS, Princess Elizabeth PS, Quaker Road PS, Ross PS, Welland Centennial SS, Welland Service Centre

For natural gas supply, DSBN's procurement practices aim to reduce the cost of purchasing natural gas. This is accomplished by hedging energy prices; that is, buying a fixed amount of natural gas at a fixed rate for several years into the future. This hedging process, based on forecasted consumption and price trends, protects DSBN from unforeseen price increases. In addition, the School Board continuously consults with an external independent consultant to determine optional natural gas pricing. Currently, DSBN natural gas commodity profile consists of a 50/50 mix of fixed natural gas contracts and indexed purchases.

Energy Use in Facilities

DSBN Staff Members have retained a great deal of knowledge with regard to their facility's energy use. This knowledge base has been enhanced by a series of comprehensive audits completed at DSBN's facilities. Through the deployment of energy management software, DSBN Staff will be equipped with the information necessary to make effective energy management decisions. This will make it possible to implement an effective energy procurement process, pursue appropriate capital projects, and implement successful conservation and demand management programs.

Equipment Efficiency

DSBN has pursued many measures to improve the energy efficiency of the School Board's equipment. Some of these measures include:

- Heating and cooling equipment retrofits,
- Building envelope improvements,
- Electrical systems upgrade, and
- The pursuit of the feasibility of solar thermal and solar photovoltaic applications.

As the understanding of corporate energy consumption improves, DSBN Staff will be equipped with the knowledge necessary to make informed decisions. This improved understanding will also reveal how simple actions like commissioning and maintenance procedures can improve existing equipment efficiencies.

Organizational Integration

Day to day management of energy has been primarily the responsibility of the DSBN Facility Services Department. Current practices will be enhanced with future plans including:

- The creation of an interdepartmental energy management team,
- Improved energy monitoring and feedback, and
- Interactive energy training and awareness.

Staff across all departments will be given the necessary tools to address corporate energy concerns such as budgeting, procurement, conservation, and generation.

Prior to the development of the CDM Plan, VIP assessed DSBN's energy management practices. This assessment was completed by speaking to DSBN staff and reviewing relevant material. Upon completion of this review, VIP determined that DSBN had provided staff members with a mandate to pursue proper energy management, and through DSBN Staff ingenuity, DSBN was able to direct resources to energy management. However, VIP also noted that if DSBN is to achieve the Ministry's mandate, it will require the development of this CDM Plan that will address DSBN's energy management needs.

5 CURRENT ENERGY CONCERNS

Environmental, societal, and fiscal pressures accentuate the need for an energy Conservation and Demand Management Plan (CDM Plan).

Environmental

Concerns surrounding energy consumption with regard to climate change and air pollution have been well documented. Since 1990, Ontario's greenhouse gas emissions have increased 14%. The Government of Ontario estimates that 75% of Ontario's greenhouse gas emissions are associated with the consumption of fossil fuels for energy purposes. Increased smog and air pollution are also connected to the consumption of energy. Ontario's electricity generation is the Province's second largest source of sulfur dioxide and the third largest source of nitrogen oxides. These pollutants can cause irreparable harm to human health.

Societal

The 2003 Blackout heightened societal concerns surrounding the stability and security of our energy supply. Energy has been imbedded into most societal practices. If energy consumption is not managed appropriately, the frequency of energy interruption and the subsequent societal disruption will increase.

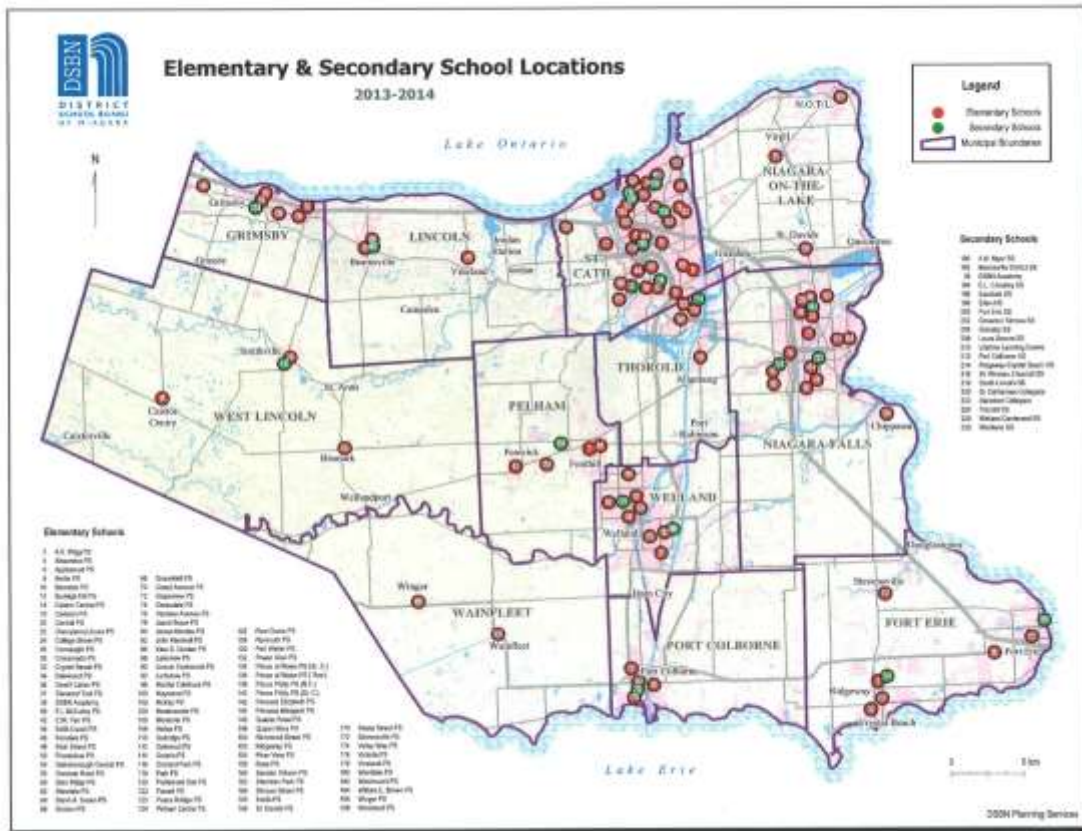
Fiscal

The fossil fuels traditionally used for the generation of energy are no longer financially accessible or environmentally acceptable. This has resulted in the promotion of renewable energy generation which comes with an additional expense. Energy costs are also anticipated to increase as Ontario's existing energy infrastructure is taken off-line or refurbished. Coming off of the lows of the 2009 recession, national electricity and natural gas prices are 27% and 21% greater than they were at the start of the decade. It is not anticipated that this upward trend will be altered in the short to medium future. The Province of Ontario has recently projected an annual 3.5% to 7.9% increase in electricity costs over the next 20 years. Natural gas is also projected to trend upward.

Similar to many School Boards in Ontario, DSBN is currently in a declining enrollment situation. It is anticipated that the enrollment will stabilize in the next few years and be relatively constant for a period of time. As DSBN stabilizes its surplus capacity, so will the School Board's environmental, societal and fiscal energy concerns. DSBN recognizes that proper energy management must be pursued if these concerns are to be addressed.

6 SCOPE OF THE CDM PLAN

The District School Board of Niagara (DSBN) is located in the Niagara Region, which is the home to approximately 427,421 citizens in an area of 1,852 km². The area is home to natural phenomena like Niagara Falls, the Niagara Escarpment and is accompanied by the shores of two Great Lakes, Lake Ontario and Lake Erie. The DSBN services education to 12 municipalities within the Region. It is the home to over 36,000 students from JK to grade 12, providing education in 86 public elementary schools and 20 public secondary schools. Within the DSBN over 32,800 classroom staff are employed and over 1,000 support staff, thus making DSBN one of the largest employers in the Niagara Region. The educational season runs from September to late June like most primary and secondary schools in Ontario. During the summer months (July-September) the schools are mainly unoccupied and there is only student enrollment for summer classes in a number of schools. Schools are also used for summer camps and events during summer months. This creates difficulty for energy management as schools are partially occupied and must have access to cooling, lighting, and ventilation. With such a vast array of DSBN buildings throughout the Niagara Region and occupancy levels varying throughout the year, energy costs are increasing and difficult to manage.



Based on 2012 data:

Niagara District School Board Facilities - General Information								
Building Name	Operation Type	Address	City	Postal Code	Total Floor Area (m ²)	Average Hours per week	Swimming Pool (Y/N)	Number of Portables
Don Reilly Resource Centre - closed	Administrative offices	13227 Lundy's Lane	Allanburg	L0S1A0	2,538	0	No	1
Education Centre	Administrative offices	191 Carlton St	St. Catharines	L2R7P4	7,281	40	No	
Niagara Falls Service Centre - closed	Administrative offices	6387 Morrison St	Niagara Falls	L2E7H1	1,569	40	No	
School Support Services (former NDSS)	Administrative offices	1875 Niagara Stone Rd	Niagara-On-The-Lake	L0S1J0	13,986	40	No	
St. Catharines Service Centre	Administrative offices	9 Wright St	St. Catharines	L2P3J3	2,298	40	No	
Welland Service Centre	Administrative offices	120 Federal Rd	Welland	L3B3P2	969	40	No	
St. Johns Outdoor Centre	Outdoor Centre	2984 Holland Rd RR#1	Fonthill	L0S1E0	308	40	No	1
A K Wigg PS	School	1337 Haist St	Fonthill	L0S1E0	2,597	60	No	
Alexandra PS	School	84 Henry St	St. Catharines	L2R5V4	4,001	60	No	
Applewood PS	School	130 Woodrow St	St. Catharines	L2P3T7	1,921	60	No	
Bertie PS	School	3770 Hazel St	Ridgeway	L0S1N0	3,078	60	No	
Briardale PS	School	1A Caroline St	St. Catharines	L2T3E9	2,659	60	No	1
Burleigh Hill PS	School	15 Burleigh Hill Dr	St. Catharines	L2T2V6	2,073	60	No	
Caistor Central PS	School	1794 Regional Rd 6	Caistor Centre	L0R1E0	2,384	60	No	1
Campden PS - closed June 2013	School	4160 Fly Rd	Campden	L0R1G0	1,798	0	No	
Carleton PS	School	1 Carlton Park Dr	St. Catharines	L2M4M9	3,702	60	No	
Central PS	School	10 Livingston Ave	Grimsby	L3M1K7	4,908	60	No	1
Cherrywood Acres PS	School	4635 Pettit Ave	Niagara Falls	L2E6L4	2,341	60	No	
College Street PS	School	132 College St	Smithville	L0R2A0	4,102	60	No	1
Connaught PS	School	28 Prince St	St. Catharines	L2R3X7	5,182	60	No	
Crossroads PS	School	1350 Niagara Stone Rd	Niagara-On-The-Lake	L0S1J0	4,942	60	No	
Crowland Central PS - closed June 2013	School	738 Lyons Creek Rd	Welland	L3B5N4	1,716	0	No	
Crystal Beach PS	School	145 Derby Rd	Crystal Beach	L0S1B0	1,946	60	No	1
Dalewood PS	School	61 Duncan Dr	St. Catharines	L2N3P3	3,837	60	No	
DeWitt Carter PS	School	435 Fares St	Port Colborne	L3K1X4	5,054	60	No	
DSBN Academy (former Empire PS)	School	20 Duncan St	Welland	L3B2C6	2,613	60	No	
Diamond Trail PS	School	315 Southworth St	Welland	L3B1Z8	4,031	60	No	
E I McCulley PS	School	16 Berkley Dr	St. Catharines	L2M6B8	2,172	60	No	1
E W Farr Memorial PS	School	9 Alsop Ave	Fenwick	L0S1E0	1,310	60	No	
Edith Cavell PS	School	1 Monck St	St. Catharines	L2S1L5	3,981	60	No	
F J Rutland PS - closed June 2012	School	8960 Willoughby Dr	Niagara Falls	L2G6X9	3,495	60	No	
Ferndale PS	School	35 Ferndale Ave	St. Catharines	L2P1V8	4,122	60	No	
Fitch Street PS	School	164 Fitch St	Welland	L3C4V5	3,046	60	No	
Forestview PS	School	8406 Forestview Blvd	Niagara Falls	L2H0B9	3,929	60	No	5
Fort Erie PS - closed June 2013	School	474 Central Ave	Fort Erie	L2A3T7	3,132	60	No	
Gainsborough PS	School	5459 Hwy 20	St. Ann's	L0R1Y0	2,895	60	No	
Garrison Road PS	School	1110 Garrison Rd	Fort Erie	L2A1N9	4,305	60	No	
General Vanier PS	School	105 Torrance St	Fort Erie	L2A2C1	1,926	60	No	
Glen Ridge PS	School	101 South Dr	St. Catharines	L2R4V7	2,084	60	No	
Glendale PS	School	24 Farnham Ave	Welland	L3C3R1	2,088	60	No	
Glynn A Green PS	School	1353 Pelham St	Fonthill	L0S1E0	4,128	60	No	
Gordon PS	School	468 Thorold Rd W	Welland	L3C3W6	2,160	60	No	4
Gracefield PS	School	117 Bayview Dr	St. Catharines	L2N4Z7	1,886	60	No	
Grand Avenue PS	School	14 Grand Ave	Grimsby	L3M2R7	3,393	60	No	
Grapeview PS	School	106 First St Louth	St. Catharines	L2R6P9	5,007	60	No	
Greendale PS	School	5504 Montrose Rd	Niagara Falls	L2H1K7	2,584	60	No	3
Heximer Avenue PS	School	6727 Heximer Ave	Niagara Falls	L2G4T1	2,667	60	No	
Jacob Beam PS	School	4300 William St	Beamsville	L0R1B0	2,926	60	No	
James Morden PS	School	7112 Dorchester Rd	Niagara Falls	L2G5V6	3,559	60	No	
John Marshall PS	School	3910 St James Ave	Niagara Falls	L2J2R3	2,992	60	No	
Jordan PS - closed June 2013	School	2831 Regional Rd 81	Jordan	L0R1S0	2,486	60	No	
Kate S. Durdan PS	School	6855 Kalar Rd	Niagara Falls	L2H2T3	7,573	60	No	
Lakeview PS	School	33 Olive St	Grimsby	L3M2B9	3,832	60	No	1
Lincoln Centennial PS	School	348 Scott St	St. Catharines	L2N1J5	3,095	60	No	
Lockview PS	School	505 Bunting Rd	St. Catharines	L2M3A9	2,915	60	No	
Maple Grove PS - closed June 2013	School	3991 Regional Rd 81	Beamsville	L0R1B1	527	60	No	
Martha Cullimore PS	School	3155 St Andrew Ave	Niagara Falls	L2J2R7	2,269	60	No	
Matthews PS - demolished August 2013	School	315 Southworth St	Welland	L3B1Z8	3,297	60	No	
Maywood PS	School	140 Haig St	St. Catharines	L2R6L3	2,456	60	No	
McKay PS	School	320 Fielden Ave	Port Colborne	L3K4T7	4,031	60	No	
Meadowvale PS	School	63 Cecil St	St. Catharines	L2N4B3	2,034	60	No	

Niagara District School Board Facilities - General Information

Building Name	Operation Type	Address	City	Postal Code	Total Floor Area (m ²)	Average Hours per week	Swimming Pool (Y/N)	Number of Portables
Memorial PS	School	17 Welland Ave	St. Catharines	L2R2M1	2,339	60	No	
Nelles PS	School	118 Main St E	Grimsby	L3M1N8	3,340	60	No	
Oakridge PS	School	1 Marsdale Dr	St. Catharines	L2T3R7	2,760	60	No	4
Oakwood PS	School	255 Omer Ave	Port Colborne	L3K3Z1	2,284	60	No	
Ontario PS	School	550 Allanburg Rd	Thorold	L2V1A8	2,563	60	No	
Orchard Park PS	School	3691 Dorchester Rd	Niagara Falls	L2J3A6	3,135	60	No	3
Park PS	School	217 Main St E	Grimsby	L3M1P5	1,535	60	No	2
Parliament Oak PS	School	325 King St	Niagara-On-The-Lake	L0S1J0	3,205	60	No	
Parnall PS	School	507 Geneva St	St. Catharines	L2N2H7	3,304	60	No	
Pelham Centre PS	School	1165 Centre St	Fenwick	L0S1C0	1,891	60	No	
Pine Grove PS	School	690 Lake St	St. Catharines	L2N4J5	2,288	60	No	1
Plymouth PS	School	111 First St	Welland	L3B4S1	3,210	60	No	
Port Weller PS	School	273 Parnell Rd	St. Catharines	L2M1W4	2,675	60	No	1
Power Glen PS	School	34 Westland St	St. Catharines	L2S4C1	4,101	60	No	2
Prince of Wales PS	School	40 Pine St	Thorold	L2V3L4	3,775	60	No	
Prince of Wales PS	School	95 Facer St	St. Catharines	L2M5J6	3,153	60	No	
Prince Philip PS	School	3112 Dorchester Rd	Niagara Falls	L2J2Z7	2,868	60	No	4
Prince Philip PS	School	600 Vine St	St. Catharines	L2M3V1	3,580	60	No	
Princess Elizabeth PS	School	330 Schofield Ave	Welland	L3B1P2	2,976	60	No	1
Princess Margaret PS	School	6624 Culp St	Niagara Falls	L2G2C4	5,947	60	No	
Quaker Road PS	School	333 Quaker Rd	Welland	L3C3G7	3,455	60	No	1
Richmond Street PS	School	153 Richmond St	Thorold	L2V3H3	4,326	60	No	
Ridgeway PS	School	143 Ridge Rd	Ridgeway	L0S1N0	3,311	60	No	
River View PS	School	3300 Cattell Dr	Niagara Falls	L2G6M9	3,032	60	No	
Rose Seaton PS - closed June 2013	School	255 Emerick Ave	Fort Erie	L2A2W4	3,053	0	No	
Ross PS	School	358 Niagara St	Welland	L3C1K9	4,040	60	No	1
Senator Gibson PS	School	4944 John St	Beamsville	L0R1B6	4,591	60	No	3
Sheridan Park PS	School	114 Linwell Rd	St. Catharines	L2N6N8	2,974	60	No	
Simcoe Street PS	School	4760 Simcoe St	Niagara Falls	L2E1V6	3,170	60	No	
Smith PS	School	18 Oakes Rd N	Grimsby	L3M4B1	2,450	60	No	2
St Davids PS	School	1344 York Rd	St. Davids	L0S1P0	3,119	60	No	
Steele Street PS	School	214 Steele St	Port Colborne	L3K4X7	3,539	60	No	
Stevensville PS	School	3521 Main St E	Stevensville	L0S1S0	3,610	60	No	1
Valley Way PS	School	5315 Valley Way	Niagara Falls	L2E1X4	1,915	60	No	
Victoria PS	School	5635 Heritage Dr	Niagara Falls	L2J4B3	1,753	60	No	
Vineland PS	School	4057 Victoria Ave	Vineland	L0R2C0	3,164	60	No	
Westdale PS	School	130 Rykert St	St. Catharines	L2S2B4	3,839	60	No	
Westmount PS	School	73 Ann St W	Thorold	L2V2J8	2,137	60	No	
William E Brown PS	School	31870 Lee St	Wainfleet	L0S1V0	2,330	60	No	
Winger PS	School	53220 Winger Rd	Wainfleet	L0S1V0	2,437	60	No	
Woodland PS	School	1511 7th St Louth	St. Catharines	L2R6P9	2,509	60	No	
A N Myer SS	Secondary School	6338 O'Neil St	Niagara Falls	L2J1M7	13,994	80	No	
Beamsville District SS	Secondary School	4317 Central Ave	Beamsville	L0R1B0	17,625	80	No	
E L Crossley SS	Secondary School	350 Hwy 20	Fonthill	L0S1E0	16,510	80	No	
Eastdale SS	Secondary School	170 Wellington St	Welland	L3B1B3	11,392	80	No	
Eden HS	Secondary School	535 Lake St, Bldg 1	St. Catharines	L2N4H7	13,849	80	No	2
Fort Erie SS	Secondary School	7 Tait Ave	Fort Erie	L2A3P1	15,250	80	Yes	
Governor Simcoe SS	Secondary School	15 Glenview Ave	St. Catharines	L2N2Z7	12,468	80	No	
Grimsby SS	Secondary School	5 Boulton Ave	Grimsby	L3M1H6	14,559	80	No	
Kernahan Park SS - closed June 2013	Secondary School	91 Bunting Rd	St. Catharines	L2P3G8	9,525	0	No	1
Laura Secord SS	Secondary School	349 Niagara St	St. Catharines	L2M4V9	9,256	80	No	
Lifetime Learning Centre	Secondary School	535 Lake St, Bldg 2	St. Catharines	L2N4H7	2,134	80	No	1
Port Colborne HS	Secondary School	211 Elgin St	Port Colborne	L3K3K4	18,602	80	No	
Queen Mary PS & St Catharines Collegiate SS	Secondary School	34 Catherine St	St. Catharines	L2R5E7	21,320	80	No	
Ridgeway-Crystal Beach HS	Secondary School	576 Ridge Rd	Ridgeway	L0S1N0	7,473	80	No	
Sir Winston Churchill SS	Secondary School	101 Glen Morris Dr	St. Catharines	L2T2N1	11,105	80	No	4
South Lincoln HS	Secondary School	260 Canborough St	Smithville	L0R2A0	5,671	80	No	
Stamford Collegiate	Secondary School	5775 Drummond Rd	Niagara Falls	L2G4L2	13,514	80	No	
Thorold SS	Secondary School	50 Ormond St N	Thorold	L2V1Z1	13,674	80	No	
Welland Centennial SS	Secondary School	240 Thorold Rd W	Welland	L3C3W2	13,516	80	No	
West Park SS	Secondary School	130 Louth St	St. Catharines	L2S2T4	12,863	80	No	
Westlane SS	Secondary School	5960 Pitton Rd	Niagara Falls	L2H1T5	12,912	80	No	
					591,033			

7 ENERGY BASELINE AND CURRENT ENERGY PERFORMANCE

Effectively managing energy requires implementing appropriate energy monitoring procedures. The establishment of an accurate energy baseline is essential in this process. It will assist with energy conservation and greenhouse gas reduction target setting, energy procurement and budgeting, bill verification, energy awareness, and the selection and assessment of potential energy projects. DSBN, like many School Boards, relies on its utility bills to establish its energy baseline.

Planned future audits will consist of a detailed analysis of historical consumption and demand information as well as a walkthrough of the facility by a qualified energy auditor. Based on the auditor's survey, a detailed equipment list and an energy consumption breakdown have been created, as well as a comprehensive list of potential energy conservation measures for each facility.

BASELINE PERFORMANCE (2011)

DSBN has elected to utilize the consumption data from 2011 to represent its baseline energy consumption performance.

District School Board of Niagara – 2011 Energy					
Building Name	Electricity Consumption (kWh)	Natural Gas Consumption (m ³)	GHG Emissions (kg)	Energy Intensity (ekWh/ft ²)	Energy Intensity (GJ/m ²)
Don Reilly Resource Centre - closed	94,217	24,346	53,567	13	0.50
Education Centre	2,418,605	6,978	206,681	32	1.23
Niagara Falls Service Centre	109,434	14,686	36,520	16	0.61
School Support Services (former NDSS)	501,013	213,744	444,191	18	0.71
St. Catharines Service Centre	109,565	5,951	20,016	7	0.27
Welland Service Centre	65,279	7,004	18,464	13	0.52
St. Johns Outdoor Centre	9,139	-	731	3	0.11
A K Wigg PS	115,940	33,016	71,696	17	0.65
Alexandra PS	169,756	31,365	72,881	12	0.45
Applewood PS	260,651	14,412	48,100	20	0.78
Battlefield PS - sold June 2012	70,051	40,922	82,972	17	0.66
Bertie PS	251,995	25,307	68,006	16	0.61
Briardale PS	120,919	43,665	92,228	20	0.79
Burleigh Hill PS	103,043	41,892	87,446	25	0.95

District School Board of Niagara – 2011 Energy

Building Name	Electricity Consumption (kWh)	Natural Gas Consumption (m ³)	GHG Emissions (kg)	Energy Intensity (ekWh/ft ²)	Energy Intensity (GJ/m ²)
Caistor Central PS	206,962	31,340	75,809	21	0.82
Campden PS	84,000	21,813	47,960	16	0.63
Carleton PS	181,855	40,703	91,503	15	0.60
Central PS	157,185	47,583	102,537	13	0.49
Cherrywood Acres PS	115,562	38,485	82,006	21	0.81
College Street PS	165,303	40,220	89,265	13	0.52
Colonel John Butler PS - sold June 2012	17,879	20,264	39,742	14	0.54
Connaught PS	397,920	171,997	357,016	40	1.55
Crossroads PS	340,126	14,135	53,934	9	0.36
Crowland Central PS	67,266	23,168	49,183	17	0.66
Crystal Beach PS	126,059	44,935	95,040	29	1.12
Dalewood PS	137,349	42,259	90,883	14	0.55
DeWitt Carter PS	137,609	38,103	83,047	10	0.39
DSBN Academy (former Empire PS)	80,876	24,837	53,428	12	0.48
E I McCulley PS	212,145	13,033	41,612	15	0.58
E W Farr Memorial PS	52,456	14,775	32,130	15	0.58
Edith Cavell PS	308,217	66,245	149,902	24	0.92
F J Rutland PS - closed June 2012	153,915	31,294	71,478	13	0.50
Ferndale PS	232,932	50,172	113,491	17	0.67
Fitch Street PS	100,011	35,017	74,205	14	0.56
Forestview PS	248,188	42,854	100,877	17	0.64
Fort Erie PS	144,144	49,075	104,314	20	0.77
Gainsborough PS	55,879	42,170	84,198	16	0.63
Garrison Road PS	124,244	33,602	73,468	10	0.40
General Vanier PS	76,461	28,369	59,752	18	0.71
Glen Ridge PS	97,585	32,646	69,528	20	0.77
Glendale PS	72,975	29,066	60,791	17	0.66
Glynn A Green PS	147,373	35,422	78,760	12	0.46
Gordon PS	117,847	32,117	70,150	20	0.77
Gracefield PS	91,760	23,095	51,005	17	0.64
Grand Avenue PS	238,062	86,274	182,156	32	1.23
Grapeview PS	640,503	27,123	102,520	17	0.67
Greendale PS	153,942	38,748	85,573	20	0.79
Heximer Avenue PS	118,116	38,857	82,913	19	0.72
Jacob Beam PS	119,198	48,520	101,269	20	0.78

District School Board of Niagara – 2011 Energy

Building Name	Electricity Consumption (kWh)	Natural Gas Consumption (m ³)	GHG Emissions (kg)	Energy Intensity (ekWh/ft ²)	Energy Intensity (GJ/m ²)
James Morden PS	191,353	51,242	112,188	19	0.74
John Marshall PS	141,261	39,951	86,833	18	0.68
Jordan PS	97,682	28,163	61,060	15	0.57
Kate S. Durdan PS	664,808	116,481	273,407	23	0.90
Lakeview PS	142,771	49,278	104,589	16	0.63
Lincoln Centennial PS	135,559	34,081	75,279	15	0.58
Lockview PS	135,423	35,714	78,356	16	0.64
Maple Grove PS	18,774	10,515	21,381	23	0.89
Martha Cullimore PS	96,919	38,982	81,454	21	0.81
Matthews PS	80,741	33,409	69,623	12	0.48
Maywood PS	87,148	26,312	56,718	14	0.54
McKay PS	149,448	51,836	109,958	16	0.63
Meadowvale PS	109,874	30,635	66,710	20	0.77
Memorial PS	157,086	42,481	92,882	24	0.94
Nelles PS	203,437	43,802	99,088	19	0.72
Oakridge PS	153,858	27,015	63,383	15	0.58
Oakwood PS	95,578	25,495	55,848	15	0.58
Ontario PS	164,479	29,944	69,771	17	0.68
Orchard Park PS	223,403	49,465	111,392	22	0.86
Park PS	88,528	27,336	58,764	23	0.89
Parliament Oak PS	34,050	57,110	110,698	19	0.72
Parnall PS	143,884	61,298	127,402	22	0.87
Pelham Centre PS	136,573	7,372	24,864	11	0.41
Pine Grove PS	220,743	19,110	53,789	17	0.67
Plymouth PS	132,133	43,854	93,482	17	0.67
Port Weller PS	149,526	47,769	102,276	23	0.88
Power Glen PS	598,410	49,334	141,144	25	0.99
Prince of Wales PS	203,737	45,952	103,177	17	0.66
Prince of Wales PS	124,244	33,602	73,468	14	0.55
Prince Philip PS	153,785	73,964	152,141	30	1.18
Prince Philip PS	159,638	58,197	122,799	20	0.78
Princess Elizabeth PS	119,835	48,163	100,645	20	0.76
Princess Margaret PS	270,700	95,953	203,067	20	0.78
Quaker Road PS	177,267	38,370	86,725	16	0.61
Richmond Street PS	244,034	89,914	189,516	26	1.00
Ridgeway PS	130,042	30,135	67,377	13	0.49
River View PS	120,396	48,269	100,889	19	0.75

District School Board of Niagara – 2011 Energy

Building Name	Electricity Consumption (kWh)	Natural Gas Consumption (m ³)	GHG Emissions (kg)	Energy Intensity (ekWh/ft ²)	Energy Intensity (GJ/m ²)
Rose Seaton PS	94,304	18,299	42,141	9	0.34
Ross PS	103,560	32,034	68,849	10	0.40
Senator Gibson PS	163,840	59,150	124,938	16	0.62
Sheridan Park PS	133,392	36,792	80,231	16	0.63
Simcoe Street PS	143,132	30,050	68,264	14	0.53
Smith PS	138,924	22,984	54,568	15	0.56
St Davids PS	179,636	58,508	124,987	24	0.93
Steele Street PS	128,663	32,465	71,672	12	0.48
Stevensville PS	251,080	50,179	114,956	20	0.78
Valley Way PS	92,876	36,240	75,946	23	0.90
Victoria PS	87,012	19,828	44,448	16	0.61
Vineland PS	70,798	39,660	80,646	14	0.56
Virgil PS - sold December 2011	-	7,837	14,817	2	0.08
Westdale PS	183,717	43,322	96,602	16	0.60
Westmount PS	119,828	39,370	84,020	23	0.91
William E Brown PS	90,828	37,135	77,475	19	0.75
Winger PS	217,705	10,163	36,631	12	0.48
Woodland PS	121,797	32,982	72,100	17	0.68
A N Myer SS	765,265	200,644	440,564	19	0.75
Beamsville District SS	440,636	260,140	527,079	17	0.65
E L Crossley SS	817,404	223,784	488,485	18	0.70
Eastdale SS	640,562	163,334	360,048	19	0.75
Eden HS	808,807	181,828	408,473	18	0.71
Fort Erie SS	781,104	224,583	487,092	19	0.75
Governor Simcoe SS	2,328,671	137,763	446,752	28	1.10
Grimsby SS	823,351	199,203	442,486	19	0.73
Kernahan Park SS	688,046	159,411	356,431	23	0.90
Laura Secord SS	608,007	84,805	208,975	15	0.59
Lifetime Learning Centre	125,150	10,511	29,884	10	0.40
Port Colborne HS	791,771	220,862	480,909	16	0.61
Queen Mary PS & St Catharines Collegiate SS	1,161,012	252,566	570,389	17	0.65
Ridgeway-Crystal Beach HS	366,384	62,851	148,139	13	0.50
Sir Winston Churchill SS	1,533,059	108,384	327,558	22	0.87
South Lincoln HS	158,819	89,290	181,520	18	0.70
Stamford Collegiate	896,075	200,886	451,486	21	0.81
Thorold SS	491,401	160,973	343,652	15	0.58

District School Board of Niagara – 2011 Energy

Building Name	Electricity Consumption (kWh)	Natural Gas Consumption (m ³)	GHG Emissions (kg)	Energy Intensity (ekWh/ft ²)	Energy Intensity (GJ/m ²)
Welland Centennial SS	1,159,186	189,165	450,375	22	0.84
West Park SS	2,348,313	129,843	433,350	27	1.04
Westlane SS	528,922	179,783	382,216	18	0.68
TOTAL	36,961,674	7,589,711	17,306,247	18	0.71

NOTE: The St. Johns Outdoor Centre consumed 3,978 litres of propane in 2011.

CURRENT PERFORMANCE (2012)

It is imperative to understand the energy characteristics of each facility. By understanding these values, baselines can be established and future retrofits and improvements to the buildings can be monitored and tracked to ensure that the intended benefits are fully realized. DSBN's most recent energy consumption inventory was completed in 2012. This inventory took into account the electricity and natural gas consumption of DSBN facilities. In 2012, DSBN's total energy use, including electricity and natural gas, was 123,990,465 equivalent kilowatt hours (ekWh). This total consisted of 33,048,346 kWh of electricity, 8,553,297 m³ of natural gas, which is equivalent to 90,902,537 ekWh, and 5.630 Litres of propane, which is equivalent to 39,582 ekWh.

District School Board of Niagara – 2012 Energy

Building Name	Electricity Consumption (kWh)	Natural Gas Consumption (m ³)	GHG Emissions (kg)	Energy Intensity (ekWh/ft ²)	Energy Intensity (GJ/m ²)
Don Reilly Resource Centre - closed	109,157	48,292	100,035	23	0.88
Education Centre	1,833,991	26,087	196,040	27	1.04
Niagara Falls Service Centre - closed	47,329	18,156	38,113	14	0.55
School Support Services (former NDSS)	485,278	226,253	466,583	19	0.74
St. Catharines Service Centre	173,774	33,999	78,182	22	0.84
Welland Service Centre	64,641	8,241	20,752	15	0.57
St. Johns Outdoor Centre	10,014		801	3	0.12
A K Wigg PS	115,549	39,713	84,326	19	0.75
Alexandra PS	188,058	34,566	80,397	13	0.50
Applewood PS	191,205	19,148	51,498	19	0.74
Bertie PS	279,547	28,711	76,645	18	0.68
Briardale PS	132,129	47,353	100,097	22	0.86

District School Board of Niagara – 2012 Energy

Building Name	Electricity Consumption (kWh)	Natural Gas Consumption (m ³)	GHG Emissions (kg)	Energy Intensity (ekWh/ft ²)	Energy Intensity (GJ/m ²)
Burleigh Hill PS	97,923	46,256	95,286	26	1.02
Caistor Central PS	241,977	45,985	106,300	28	1.10
Campden PS - closed June 2013	93,951	26,283	57,208	19	0.75
Carleton PS	160,127	45,941	99,667	16	0.63
Central PS	203,605	85,013	177,016	21	0.81
Cherrywood Acres PS	108,701	48,469	100,333	25	0.96
College Street PS	162,162	50,713	108,853	16	0.62
Connaught PS	386,983	78,440	179,260	22	0.85
Crossroads PS	326,897	226,139	453,696	51	1.99
Crowland Central PS - closed June 2013	64,655	26,652	55,561	19	0.73
Crystal Beach PS	126,969	54,300	112,818	34	1.30
Dalewood PS	135,791	48,375	102,323	16	0.61
DeWitt Carter PS	142,000	43,933	94,422	11	0.43
DSBN Academy (former Empire PS)	78,033	30,723	64,329	14	0.56
Diamond Trail PS	52,327	15,687	33,844	5	0.20
E I McCulley PS	213,940	15,886	47,149	16	0.63
E W Farr Memorial PS	52,996	18,043	38,352	17	0.67
Edith Cavell PS	307,917	82,939	181,440	28	1.08
F J Rutland PS - closed June 2012	81,740	41,315	84,650	14	0.54
Ferndale PS	190,779	55,955	121,052	18	0.69
Fitch Street PS	101,872	44,016	91,368	17	0.67
Forestview PS	271,492	36,255	90,264	16	0.60
Fort Erie PS - closed June 2013	133,200	53,248	111,329	21	0.80
Gainsborough PS	59,585	46,849	93,340	18	0.69
Garrison Road PS	217,560	82,970	174,270	24	0.92
General Vanier PS	104,994	31,799	68,520	21	0.83
Glen Ridge PS	101,964	36,082	76,374	22	0.84
Glendale PS	74,638	36,172	74,359	20	0.79
Glynn A Green PS	155,913	48,574	104,309	15	0.59
Gordon PS	129,759	37,510	81,298	23	0.88
Gracefield PS	103,065	24,720	54,981	18	0.70
Grand Avenue PS	207,409	86,682	180,476	31	1.20
Grapeview PS	654,675	27,737	104,814	18	0.68

District School Board of Niagara – 2012 Energy

Building Name	Electricity Consumption (kWh)	Natural Gas Consumption (m ³)	GHG Emissions (kg)	Energy Intensity (ekWh/ft ²)	Energy Intensity (GJ/m ²)
Greendale PS	162,397	48,767	105,192	24	0.95
Heximer Avenue PS	109,763	43,023	90,121	20	0.77
Jacob Beam PS	121,080	52,566	109,070	22	0.84
James Morden PS	171,902	51,047	110,263	19	0.72
John Marshall PS	142,268	43,537	93,694	19	0.73
Jordan PS - closed June 2013	96,724	32,570	69,316	17	0.64
Kate S. Durdan PS	636,413	115,401	269,093	23	0.89
Lakeview PS	137,177	57,688	120,042	18	0.70
Lincoln Centennial PS	139,182	41,990	90,523	18	0.68
Lockview PS	120,701	35,914	77,556	16	0.62
Maple Grove PS - closed June 2013	14,961	11,776	23,462	25	0.96
Martha Cullimore PS	84,672	33,321	69,771	18	0.70
Matthews PS - demolished August 2013	72,775	31,076	64,575	11	0.44
Maywood PS	85,209	29,696	62,961	15	0.59
McKay PS	159,000	56,287	119,138	17	0.68
Meadowvale PS	106,965	39,025	82,339	24	0.92
Memorial PS	189,623	46,194	102,506	27	1.05
Nelles PS	213,197	54,865	120,785	22	0.86
Oakridge PS	156,943	31,513	72,136	17	0.64
Oakwood PS	125,496	30,772	68,217	18	0.71
Ontario PS	162,825	34,085	77,468	19	0.74
Orchard Park PS	218,013	55,740	122,824	24	0.93
Park PS	135,000	40,004	86,434	34	1.31
Parliament Oak PS	141,820	66,071	136,261	24	0.95
Parnall PS	146,969	76,131	155,693	27	1.04
Pelham Centre PS	176,047	8,070	29,340	13	0.50
Pine Grove PS	201,457	23,717	60,956	18	0.71
Plymouth PS	143,965	51,535	108,951	20	0.78
Port Weller PS	140,684	52,528	110,566	24	0.94
Power Glen PS	618,164	57,952	159,019	28	1.08
Prince of Wales PS	213,867	60,556	131,598	21	0.82
Prince of Wales PS	133,873	38,273	83,070	16	0.62
Prince Philip PS	193,458	50,023	110,052	23	0.91
Prince Philip PS	173,538	68,022	142,488	23	0.90
Princess Elizabeth PS	122,658	56,774	117,151	23	0.88
Princess Margaret PS	284,627	109,131	229,095	23	0.87

District School Board of Niagara – 2012 Energy

Building Name	Electricity Consumption (kWh)	Natural Gas Consumption (m ³)	GHG Emissions (kg)	Energy Intensity (ekWh/ft ²)	Energy Intensity (GJ/m ²)
Quaker Road PS	187,892	42,490	95,365	17	0.67
Richmond Street PS	250,041	99,500	208,121	28	1.09
Ridgeway PS	181,567	42,164	94,242	18	0.68
River View PS	147,323	47,446	101,489	20	0.77
Rose Seaton PS - closed June 2013	103,567	25,494	56,485	11	0.44
Ross PS	125,118	41,703	88,855	13	0.51
Senator Gibson PS	181,612	62,464	132,626	17	0.66
Sheridan Park PS	158,534	52,810	112,526	22	0.87
Simcoe Street PS	135,188	37,906	82,480	16	0.61
Smith PS	145,233	29,817	67,992	18	0.68
St Davids PS	173,272	48,308	105,195	20	0.79
Steele Street PS	132,080	44,815	95,296	16	0.62
Stevensville PS	225,480	54,972	121,970	21	0.81
Valley Way PS	87,523	34,913	73,010	22	0.86
Victoria PS	85,184	22,390	49,146	17	0.66
Vineland PS	82,827	53,863	108,462	19	0.75
Westdale PS	176,052	52,328	113,018	18	0.69
Westmount PS	105,907	47,082	97,487	26	1.02
William E Brown PS	90,654	44,636	91,642	23	0.87
Winger PS	243,485	12,684	43,459	14	0.56
Woodland PS	110,522	37,401	79,553	19	0.73
A N Myer SS	785,574	241,327	519,105	22	0.86
Beamsville District SS	450,902	290,169	584,674	19	0.72
E L Crossley SS	474,740	229,866	472,570	16	0.64
Eastdale SS	641,241	194,557	419,134	22	0.86
Eden HS	617,794	220,607	466,510	20	0.77
Fort Erie SS	797,760	239,928	517,435	20	0.79
Governor Simcoe SS	1,797,538	145,120	418,171	25	0.96
Grimsby SS	772,445	187,546	416,375	18	0.68
Kernahan Park SS - closed June 2013	659,113	174,406	382,466	25	0.95
Laura Secord SS	609,772	95,209	228,786	16	0.63
Lifetime Learning Centre	94,215	13,559	33,172	10	0.40
Port Colborne HS	758,000	234,408	503,819	16	0.63
Queen Mary PS & St Catharines Collegiate SS	1,508,399	293,487	675,546	20	0.78
Ridgeway-Crystal Beach HS	427,681	80,576	186,554	16	0.62

District School Board of Niagara – 2012 Energy

Building Name	Electricity Consumption (kWh)	Natural Gas Consumption (m ³)	GHG Emissions (kg)	Energy Intensity (ekWh/ft ²)	Energy Intensity (GJ/m ²)
Sir Winston Churchill SS	1,446,609	118,374	339,530	23	0.88
South Lincoln HS	151,348	70,357	145,126	15	0.57
Stamford Collegiate	851,901	236,287	514,883	23	0.90
Thorold SS	305,332	157,182	321,599	13	0.52
Welland Centennial SS	1,124,873	209,037	485,202	23	0.89
West Park SS	1,299,403	164,315	414,610	22	0.85
Westlane SS	334,464	216,321	435,739	19	0.73
TOTAL	34,467,853	8,693,649	19,193,877	20	0.77

NOTE: The St. Johns Outdoor Centre consumed 5,630 litres of propane in 2012.

In all, DSBN has increased its energy intensity from 2011 to 2012 indicating a slight shift in energy utilization from 0.71 GJ/m² to 0.77 GJ/m².

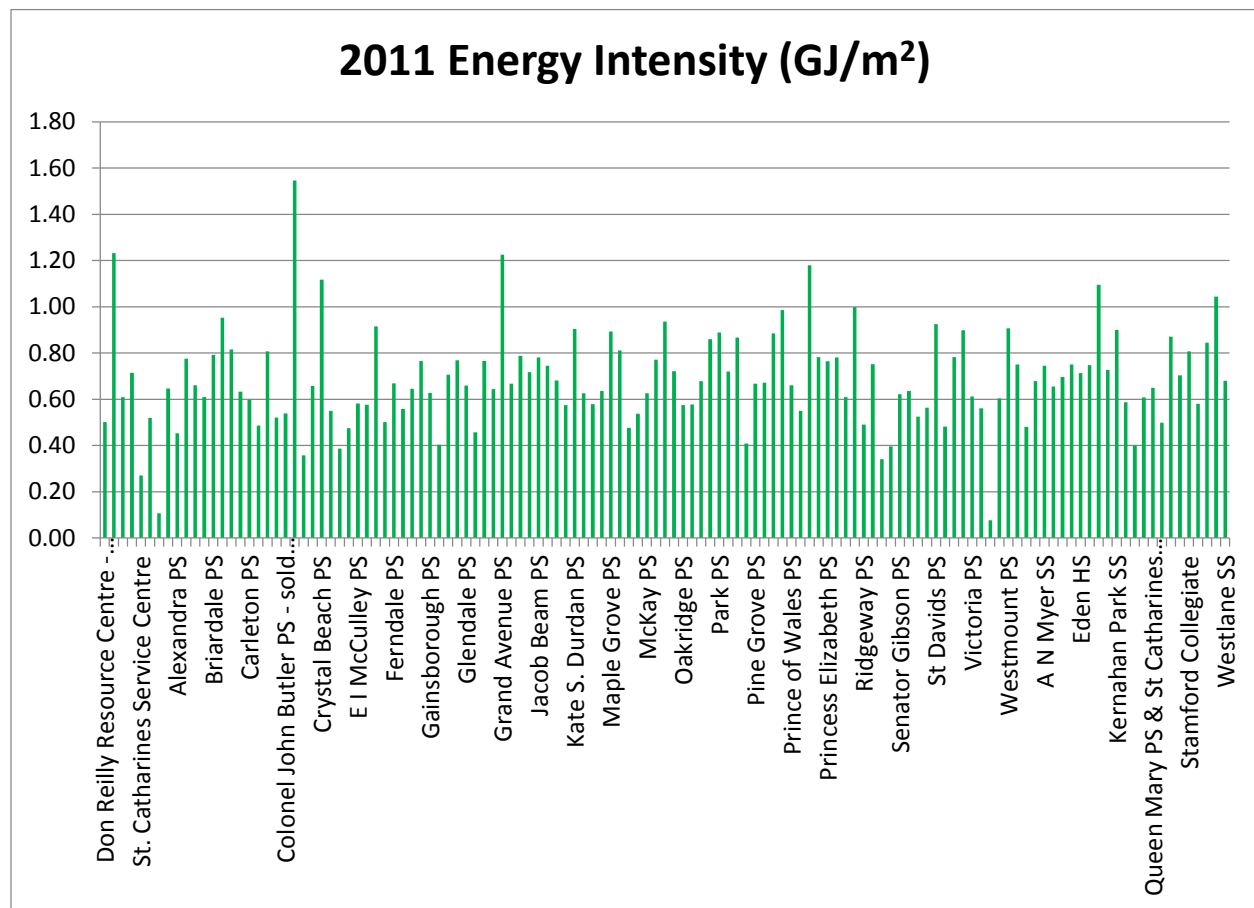
BENCHMARKING

Market Sector

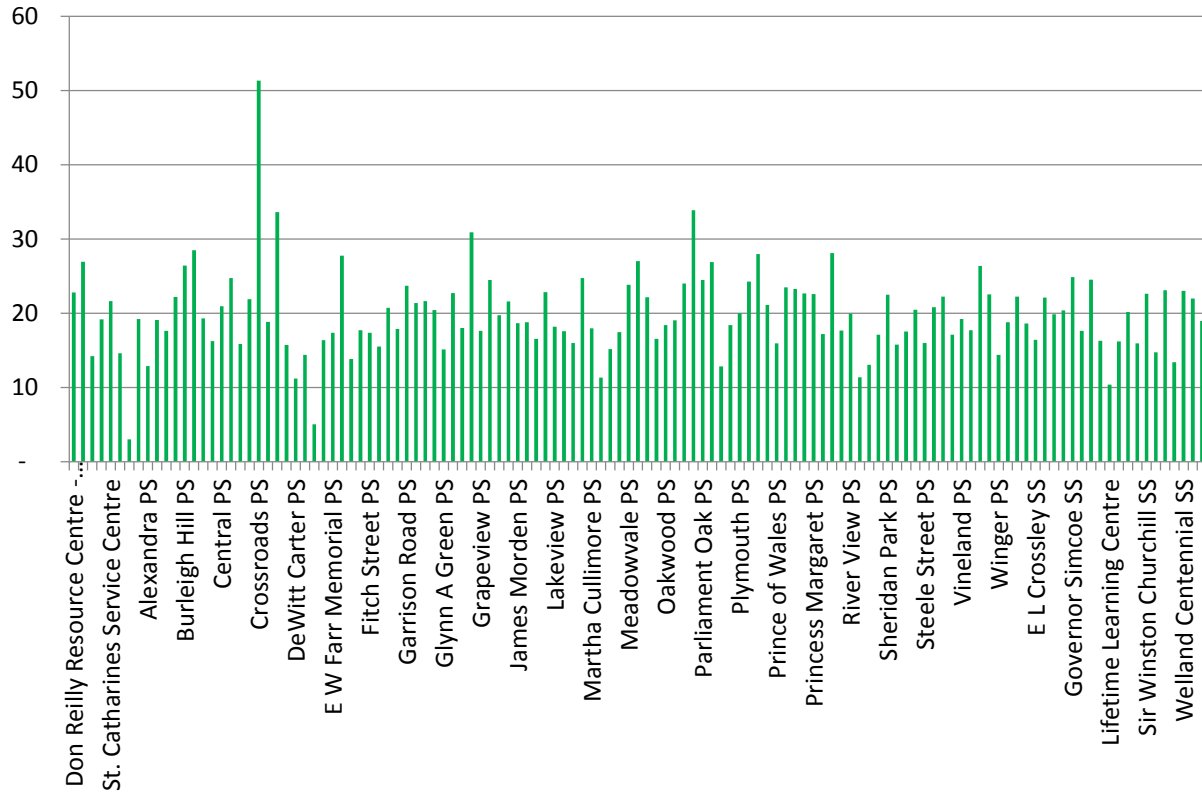
Energy Intensity (ekWh/ft ²)				
Sector	Minimum	Average	Maximum	No. of Organizations
School Board	13.0	19	41	70

DSBN's facilities have an average 20 ekWh/ft² energy intensity, on par with the industry average based on the Ministry of Energy's 2011 Public Sector Energy Consumption Data. DSBN ranks 29th amongst all School Boards in Ontario for energy intensity.

DSBN Facilities



2012 Energy Intensity (ekWh/ft²)



8 MISSION AND VISION

Mission

The DSBN is committed to student success by working together to inspire, empower, and support all learners to achieve their full potential.

Vision

Achieving success together.

The CDM Plan has been developed to address the fiscal, societal, and environmental costs and risks associated with energy consumption. Proper energy management will allow DSBN to display leadership, improve the delivery of services, and enhance the overall quality of life with respect to the community and schools.

This CDM Plan outlines key actions that must be pursued to make this vision a reality. The completion of these actions will assist DSBN to meet its energy conservation targets and greenhouse gas emission reduction commitment. Achieving these goals will assist DSBN in securing a strong energy management reputation and will allow for cost savings that can benefit DSBN, its employees, and its students.

It is acknowledged that, for this vision to come to fruition, energy management at DSBN must become an inclusive process. Recognizing that energy affects everyone differently, this Plan was created to address a variety of energy related concerns, while capturing innovative and relevant actions that will lead to meaningful change.

This CDM Plan will allow energy management to be incorporated into all DSBN activities, including organizational and human resource procedures, procurement practices, financial management and investment decisions, and facility capital, operations, and maintenance.

Overview

This CDM Plan is designed to meet the current energy needs and obligations of DSBN. The intent is to guide DSBN in the development of an energy management foundation. This will be a living Plan that will evolve as DSBN's energy needs are revealed and better understood.

DSBN's approach to energy management is three pronged. It begins with:

- Elimination of waste,
- Improving efficiencies, and
- Optimizing energy supply.

Prior to pursuing these actions, DSBN must be aware of the facility and Staff behaviours that influence energy consumption. Once encapsulated, this knowledge must be dispersed throughout the organization, allowing for the development of a culture of sustainability.

An improved understanding of corporate energy consumption will require improvements in energy management and awareness. Energy awareness campaigns will strive to make energy a tangible asset that Staff Members can appreciate when it is being consumed or wasted. In addition to increasing energy awareness, this energy Plan will integrate energy efficiency into the strategic, capital and operational decision making of the organization.

9 GOALS AND OBJECTIVES

It is of critical importance to improve energy efficiency and reduce our operating costs. Equally important is displaying our commitment to the environment through the reduction of greenhouse gases, while improving our air quality. It is also important that these actions are carried out without adversely impacting DSBN's operations. All DSBN staff will have an essential role in the success of this energy management Plan. It will be the responsibility of the Energy Management Team to ensure that energy management measures are properly communicated and effectively implemented. An Energy Mandate for DSBN has been developed and is an integral component of this CDM Plan.

DSBN's CDM Plan was completed to help support the following strategic priorities:

- Respect
 - Value everyone's contribution towards student success,
 - Acknowledge and celebrate the diversity, dignity, success and worth of all individuals, and
 - Embrace environmental stewardship.
- Relationships
 - Build a culture of co-operation, collaboration, trust and respect,
 - Expand our educational community by fostering partnerships among students, Staff, family and community,
 - Implement a healthy balanced lifestyle and foster wellness, and
 - Strengthen a culture that supports and celebrates success and innovation.
- Responsibility
 - Provide a caring, inclusive, safe and healthy learning and working environment,
 - Model good citizenship and promote global awareness,
 - Utilize our resources wisely and efficiently,
 - Promote creative and critical thinking for life-long learners, and
 - Share and implement best practices and innovative approaches that enhances student achievement.

The primary objective of this Plan is to improve the management of DSBN's energy consumption. Part of this objective is setting a conservation target that will see DSBN reduce its 2011 energy consumption by 5% by the end of 2018/2019 school year. Recognizing that DSBN has a sustainable student base, DSBN's energy conservation target will be intensity based. It is also the objective of this Plan to improve DSBN's understanding of energy consumption which is essential for DSBN to meet its corporate energy management goals.

Measurements of Success

The measurements of success will be based on a variety of indicators:

- Reaching the CDM Plan's energy conservation target,
- Assisting with the corporate greenhouse gas reduction target,
- Achieving the savings outlined in the Plan's budget section, and
- Imbedding energy management in DSBN's strategic, capital and operations decision making process.

Reporting Standards

The CDM Plan will allow for the monitoring and reporting that is necessary for DSBN to meet the regulatory requirements of the **Green Energy Act** and DSBN's greenhouse gas reduction targets. Regular energy monitoring and feedback to the Ministry and DSBN Management and Staff will improve knowledge and help make energy consumption a tangible asset, making possible appropriate behavioural changes. The intent of monitoring and reporting on energy consumption is to make energy management transparent and the consumer accountable. The Ministry will be provided with annual updates on the state of energy management at DSBN. Energy consumption feedback provided to Staff will be imbedded into DSBN's regular business.

10 ENERGY MANAGEMENT TEAM

Historically, DSBN addressed Energy Conservation and Demand Management on a project-by-project basis through the activities of the Facility Services Department. Strategic directives have been provided by the School Board's Director of Education and the Senior Executive Team.

This CDM Plan outlines a commitment to integrate Energy Conservation and Demand Management into the operations of the School Board, as indicated in the covering letter from the Superintendent of Business. Within the duration of the CDM Plan, CDM planned activities will become an integral component of the annual budgeting process. A collaborative effort will be undertaken to achieve this integration, involving:

- Internal Staff (which may include but will not be limited to Facilities Management, Finance, and Procurement),
- Advisement from the Ministry of Energy and Ministry of Education, and
- Consultations with Energy Management experts.

The current Energy Management Team at DSBN is comprised of:

- Manager of Operations,
- Manager of Projects & Maintenance,
- Facility Renewal Coordinator,
- Facility Services Facility Analyst, and
- Environmental Coordinator.

Energy Co-ordinator Position

As a future goal of DSBN, a position has been approved for an Energy Coordinator to support the Conservation and Demand Management Plan. The candidate will hold the daily responsibilities of procurement/acquisition of utility commodities and related services; analyzing facility audits and systems; preparing and presenting business cases for identifying energy projects, developing standards and operational policies and liaise with local suppliers and service agencies. The individual will also be responsible for energy-related strategies and building automation systems.

11 FINANCIAL ASSESSMENT

The energy Conservation and Demand Management Plan's financial assessment philosophy is to treat fiscal resources as if they were energy assets. Therefore, financial investments follow the same three pronged approach used for the management of energy:

- Elimination of waste,
- Improving efficiencies, and
- Optimizing energy supply.

The initial cost and saving estimates for the proposed process improvements, program implementation, and projects are broken down as follows:

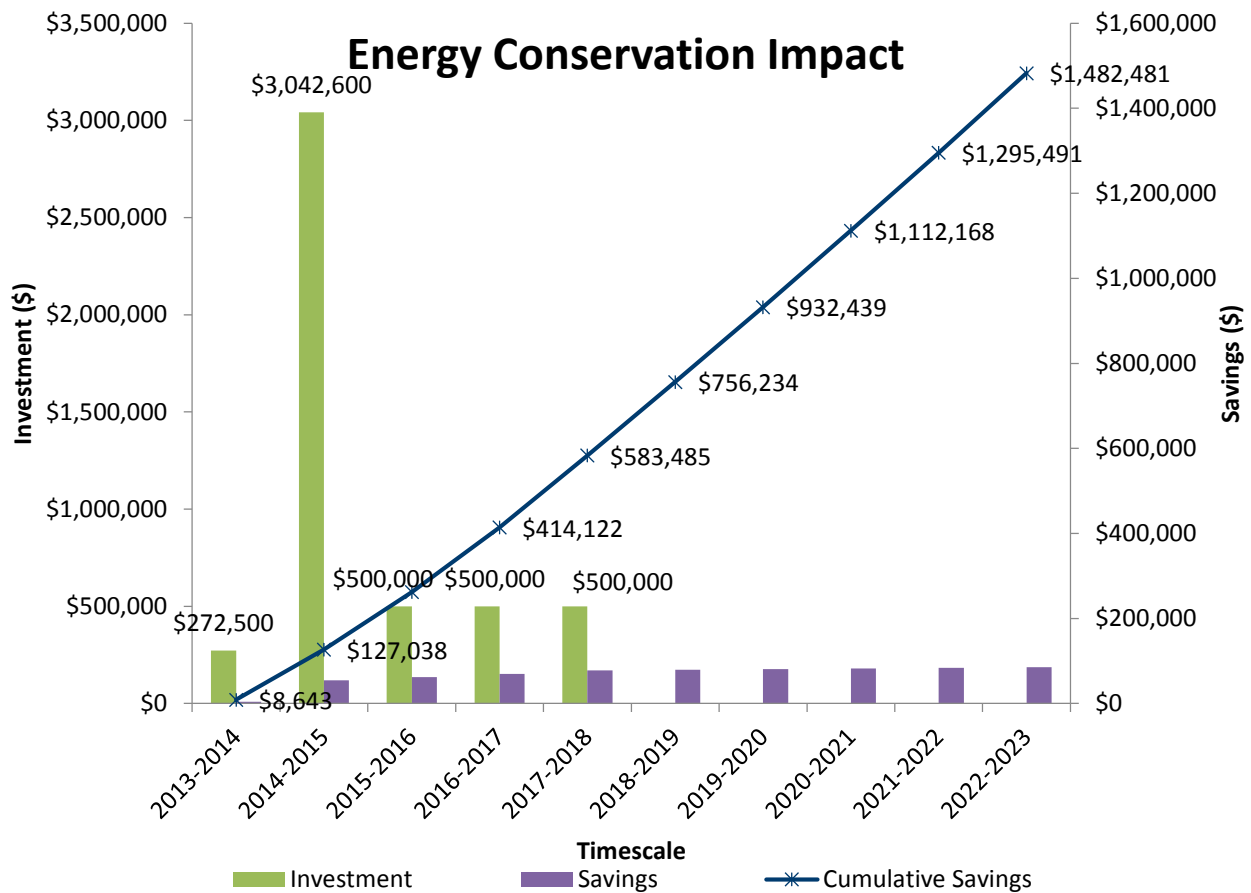
District School Board of Niagara Energy Projects Financial Summary				
School	Opportunity	Annual Savings (\$)	Estimated Installation Cost (\$)	Payback Period (years)
Eden High School	Science Lab Retrofits	\$14,286	\$500,000	35
E.L. Crossley SS	Science Lab Retrofits	\$7,143	\$250,000	35
Westlane SS	Science Lab Retrofits	\$14,286	\$500,000	35
Thorold SS	Science Lab Retrofits	\$14,286	\$500,000	35
Centennial SS	Science Lab Retrofits	\$7,143	\$250,000	35
Eastdale SS	Science Lab Retrofits	\$14,286	\$500,000	35
Applewood PS	Heating Plant Upgrades	\$5,000	\$99,600	20
Pine Grove PS	Heating Plant Upgrades	\$5,000	\$99,600	20
Steele Street PS	Heating Plant Upgrades	\$3,500	\$69,600	20
Ontario PS	Lighting Retrofit	\$2,000	\$19,600	10
Prince Philip PS (SC)	Lighting Retrofit	\$6,000	\$59,600	10
Princess Elizabeth	Lighting Retrofit	\$2,000	\$59,600	30
Dalewood PS	Exterior Entrance Improvement	\$1,600	\$40,000	25
Lakeview PS	Exterior Entrance Improvement & Exterior Door Replacement	\$800	\$20,000	25
Ross PS	Exterior Entrance Improvement	\$4,000	\$100,000	25
Westlane SS	Exterior Entrance Improvement	\$6,000	\$150,000	25
Governor Simcoe SS	Exterior Entrance Improvement	\$6,000	\$150,000	25
Stamford Collegiate	Exterior Entrance Improvement	\$25,000	\$1,000,000	40
Princess Margaret PS	Window Replacement	\$3,750	\$75,000	20
Grimsby SS	Window Replacement	\$17,500	\$350,000	14
Bertie PS	Energy Audit	\$7,500	0	0
Ridgeway PS	Energy Audit	\$7,500	0	0
Crystal Beach PS	Energy Audit	\$7,500	0	0
TOTAL		\$143,044	\$4,815,100	34

The listed costs and savings are for the inaugural year of a process, program, or project. If initiated and monitored effectively, it can be anticipated that these savings can be sustained. It should also be noted that the price of energy is anticipated to increase, whereas the costs of capital projects will likely decrease with advancements in technology. This could potentially lead to increased savings and decreased costs in the later years of the plan. The potential for avoided costs adds to the relevance of a plan of this nature.

This fiscal assessment does not take into account the economic benefits of achieving all of the corporate energy management goals. Due to the difficulty in quantifying the economic value of extended equipment longevity, improved comfort and productivity, and climate change mitigation, it should not be discounted.

12 CORPORATE ENERGY BUDGET

The following budget was derived from the planned actions within the CDM Plan. Each year's estimated cumulative savings have also been displayed in the figure below. These projected costs and savings do not consider the human resource expenditures.



Prior to requesting funding for energy actions, DSBN will consult with utility representatives and/or energy consultants, allowing DSBN to schedule project launch dates in parallel with applicable incentive funding programs. The projects may be moved forward or delayed based on changes to incentive programs as well as changes to the CDM Plan. However, DSBN will not make significant alterations to the Plan in a quest for incentive funding. This is not a prudent approach to planning. Actions will be pursued only when they coincide with the DSBN's objectives and are appropriate to be pursued at that time.

As DSBN continues to evolve and its energy needs become greater, it will be essential to reassess and clarify, as necessary, the financial indicators that are applied to investment analysis and prioritization of proposed energy projects. Energy efficiency projects must be weighted appropriately relative to other investment needs. There will also be a need to develop procedures for the annual allocation of capital resources for energy efficiency measures in the capital budget.

13 ENERGY MANAGEMENT ACTIONS

The economic feasibility of proposed actions played a large role in the prioritization of the processes, programs, and projects. Equally important in this prioritization exercise was the evaluation of DSBN's internal capacity to complete the proposed initiatives. Recognizing the need to develop DSBN's internal capacity, the initial years of the Plan focus heavily on processes and programs. The implementation of the recommended processes and programs will result in an improved understanding and awareness of energy consumption. This will allow for improved decision making and greater success with future energy projects (See **Appendix C** for the CDM Plan timeline). As these actions are completed, the Energy Management Team will meet to discuss monitoring results and how they can be used to enhance the Plan. The CDM Plan is intended to be a living document. Anticipated improvements in knowledge and capacity will result in enhancement of the proposed actions.

Annual Reporting

An Annual Conservation and Demand Management Plan Update Report will be provided that details DSBN's activities and results relating to this 2014-2018 Energy Conservation and Demand Management (CDM) Plan. The Report will describe the CDM Plan related activities that have happened in the previous year and will focus on linking actions to results. In addition, the Report will take a forward view of the upcoming year to lay out the roadmap and identify any changes or adjustments that should be considered based on what the current market conditions are. The overarching goal of the report is to make the 5 year CDM Plan a living document that is reviewed and updated on a yearly basis.

Future Energy Projects

Energy projects at DSBN were evaluated prior to the development of the CDM Plan. DSBN Staff Members have advocated for some ambitious energy initiatives that were investigated and determined to be not feasible for a variety of reasons. It is anticipated that as DSBN grows and energy management practices evolve, these actions will be reassessed.

Future Energy Reduction Projects Summary		
Year	Facility	Planned Activity
2013	Centennial SS	Science Lab Retrofits
	Bertie PS	Energy Audit
2014	Ridgeway PS	Energy Audit
	Crystal Beach PS	Energy Audit
2014 2015	Eden High School	Science Lab Retrofits
	E.L. Crossley SS	Science Lab Retrofits
	Applewood PS	Heating Plant Upgrades
	Pine Grove PS	Heating Plant Upgrades
	Steele Street PS	Heating Plant Upgrades
	Ontario PS	Lighting Retrofit
	Prince Philip PS (SC)	Lighting Retrofit
	Princess Elizabeth	Lighting Retrofit
	Dalewood PS	Exterior Entrance Improvement
	Lakeview PS	Exterior Entrance Improvement & Exterior Door Replacement
	Ross PS	Exterior Entrance Improvement
	Westlane SS	Exterior Entrance Improvement
	Governor Simcoe SS	Exterior Entrance Improvement
	Stamford Collegiate	Exterior Entrance Improvement
	Princess Margaret PS	Window Replacement
	Grimsby SS	Window Replacement
	2015 2016	Westlane SS
2016 2017	Thorold SS	Science Lab Retrofits
2017 2018	Eastdale SS	Science Lab Retrofits

Renewable Energy

Feasibility and promotion of renewable energy technologies were examined throughout the development of the CDM Plan. These technologies have been incorporated into the CDM Plan where it made sense to do so, strategically or fiscally.

Renewable energy projects are being considered to save electricity and heating costs across DSBN buildings. The most prevalent and cost effective programs include photovoltaic and thermal solar panels on building rooftops to produce electricity as well as building hot water.

The implementation of renewable energy projects will allow for the production of green energy and help the school board save money on energy costs. DSBN could also earn revenue from renewable energy

project through selling electricity back to the grid. Funding programs for renewable energy projects are provided by a number of government initiatives and incentive programs to provide schools with green energy and a positive learning experience for students. The Micro FIT program offered by the Ontario Power Authority ensures that the energy generated and sold back to the province electricity grid will have a guaranteed price over a 20-year term (Authority, 2014).

Currently the DSBN has one facility that is operating with solar panels, Crossroads Elementary School. In order to assess the energy produced from the facility the DSBN is committed to monitoring and metering the school. The solar panels are monitored through an interactive website allowing users to analysis and compile data about the solar panels at the Crossroads site. It displays real-time energy consumption data online and is able to be accessed by the schools. This allows for educational experience through providing students and teachers the opportunity to monitor how their habits within the building are effecting energy consumption. By allowing Crossroads to monitor their energy consumption, they will become more engaged through the interactive aspects associated and work towards energy conservation targets.

The DSBN is committed to implementing similar projects for any schools that are equipped with solar panels. Continuing to monitor energy production and consumption will allow for a better understanding of consumption patterns and how habits within a school can affect their overall consumption

Purchasing Practices

Traditionally, purchasing practices in the public sector were designed to favour equipment or physical retrofits at the lowest cost in order to ensure the highest possible financial responsibility. As energy conservation best practices emerged, it was revealed that there is a major issue in doing this. Almost all wasteful energy consuming equipment is less expensive than their energy conserving counterparts. The practice in itself does not encourage energy efficiency, as most energy intensive alternatives such as standard efficiency motors are less costly than their higher efficiency counterparts. When dealing with energy intensive hardware, the initial capital cost is only a fraction (5%-10%) of the total lifecycle cost.

The practice of 'low bidder wins' purchasing limits the Staff when trying to make the right environmental decision. Making a specific amount of money available to include the conservation upgrades allows the School Board to take advantage of necessary investments in order to reduce their impact on the bottom line after the cost of purchase. For example, when purchasing a motor, all suppliers will specify standard efficiency motors. An energy smart buyer will know that 90%+ of the motor's lifecycle cost is in its energy use. Therefore, buying a premium efficiency motor at a small incremental cost has a payback of less than three years. Missing this opportunity translates into a long-term financial increase. In fact, the incremental cost between a less efficient and a more efficient alternative is often less than 5% of the capital cost. That 5% capital cost difference is often recuperated in less than three years. This allows Staff to make the right environmental decision based on industry best financial practices.

Energy Management and Information Systems

An Energy Management and Information System (EMIS) is an important element of a comprehensive Energy Management Program (EMP), as it helps to ensure that the full benefits of other energy conservation efforts are achieved and sustained. In fact, a quality EMIS can reduce energy use and cost by at least 5%. (Reference: Office of Energy Efficiency, National Resources Canada). Current industry and international standards, such as the International Performance Measurement & Verification Protocol (IPMVP), use an average of an 8%-10% reduction in energy consumption and costs. VIP Energy Services has documented a conservation average of 17% over customers served to date. However, in order to be as conservative as possible in its financial calculations, VIP generally uses NRCan's conservative numbers (5%) to ensure objectivity in the investment matter. The savings from an EMIS result from the following measured impacts:

- Early detection of poor performance,
- Support for optimal decision making,
- Effective performance reporting,
- Auditing of historical performance,
- Identification and justification of energy projects,
- Evidence of implementation success,
- Support for energy budgeting and accounting, and
- Provision of energy data to other systems (such as Building Automation Systems, BAS).

When looking at performance reports, an EMIS facilitates ensuring that upgrades or changes actually meet forecasted savings, as well as the quantification of losses or gains. However, it is important to note that placing meters to isolate individual retrofit projects determined by their scope is generally cost ineffective and typically does not allow incorporation of out-of-scope project factors that directly affect equipment performance.

A one-time, comprehensive metering solution allows for a much more cost effective view, while enabling accountability to 90% of the planned projects budgeted to date. Reporting can be the most essential part of this plan as multiple portions of the organization rely on this data to make periodic decisions. The Finance Team can use this information to verify billing accuracy and other potential costs, such as construction back-charges. Energy Conservation Managers generally look at this data for building performance, future opportunity and functional trending. Project Managers rely on this information to ensure that vendors are supplying and meeting contractual obligations. Collecting the information in any EMIS program is really only the first step, as the data must then be used to instigate change and push action. This can only be done through analysis and warning systems built on baseline information. In order for an EMIS system to function properly, communication loops must also be established between

departments in order for the maximum benefit to be realized. These systems can be as simple as an online Data Storage, Retrieval and Reporting System using billing data to form the basis and baselines for future comparison.

Building Re-Commissioning

Building re-commissioning, or retro-commissioning, refers to the optimization of the current automation, controls and energy consuming systems. As buildings age, both the functionality of the equipment and the functions that they serve can undergo significant changes. A re-commissioning program generally focuses on ensuring that the equipment operations are modified to include any new or deleted duties. The following is a list of common problems found in re-commissioning projects that result in increased energy costs:

- Inefficient scheduling of HVAC equipment,
- Simultaneous heating and cooling,
- Economizer sequences not optimized,
- Incorrect airflow and water balance,
- Malfunctioning sensors or incorrect calibration,
- Fan VFD control overridden,
- Supply air static pressure set-points not optimized,
- Boiler controls not operating efficiently,
- Balancing dampers and valves not installed or installed in poor or unusable locations,
- Incorrectly piped water coils,
- Process or space classification changes (lab space to office, etc.),
- Incomplete or incorrect control component installation,
- Control sequence incorrectly implemented,
- Substituted control components,
- Incomplete installations (missing control valve, actuators, etc.), and
- Testing, adjusting, and balancing (TAB) not completed or only partially completed.

National Resources Canada (NRCAN) has published several guidelines for costing and expected returns from re-commissioning projects. Building re-commissioning is an increasingly important practice, not only from an energy standpoint, but also from a comfort and safety perspective as well. The more complex building controls and ventilation become, the more risk there is that one or more components will fail or deliver incorrect measurements.

Current practices in re-commissioning indicate that the cost to complete these initiatives is between \$2.90 and \$4.50/m². Expected savings from the projects are typically between \$1.00 and \$4.00/m², depending upon the starting efficiency of the building, thus creating very attractive paybacks in this area.

Energy and Resource Awareness (ERA) Programs

Independent studies done by organizations such as Natural Resources Canada (NRCan) show that initiatives directed at Staff and facility users, in particular ERA Programs, can lead to significant savings on their own. In fact, NRCAN reports indicate that dedicated, consistent Energy Awareness Programs are proven to be the most effective way to reduce energy usage with no capital costs and minor operational expenses. A conservative estimate of savings for an effective ERA Program can be as high as 5% -7% of annual utilities spending.

An effective ERA Program is designed to assist organizations to attain energy savings by promoting a fundamental shift in the personal philosophies of Staff and facility users towards reducing their energy use. The Program utilizes community-based social marketing to develop influential communication materials and in-house displays that are carefully designed to inform and motivate employees to effectively decrease energy consumption. In many cases, an ERA Program has proven to be the most effective way to lower energy usage without any capital costs and minimal operational expenses. A typical ERA Program would include features such as:

- A detailed ERA Program written plan including a GANTT chart,
- The creation of a program email address for suggestions and concerns and access to ERA experts to answer questions,
- A customized identity and marketing program ,
- Training and support for an Energy Steward Team,
- ERA displays with various relevant conservation themes, and
- Annual Marketing Effectiveness Reports and Feedback system.

A continuous and consistent ERA Program is not only an effective way to lower energy use within a facility, but can also serve to be an effective marketing tool to spread the word that the School Board is a community leader in energy conservation and environmental sustainability.

Reduction of Building Inventory

To manage the building portfolio, DSBN has developed consistent business plans to frequently review accommodation needs throughout the region. Currently, the Board has nine schools and one administration building declared surplus and are being offered for sale. Another seven schools have been officially closed. This total of 17 buildings could potentially reduce the current building area of DSBN from 6,448,881 ft² to 5,668,483 ft². Corresponding energy demands will also be reduced.

Energy Management Committee Work

EECC - Employee Energy Conservation Committee

The EECC is made up of representatives from several DSBN Employee Groups including: the Canadian Union of Public Employees (CUPE); the Elementary Teachers' Federation of Ontario (ETFO); the Ontario Secondary School Teachers' Federation (OSSTF); DSBN's Elementary School Principals and DSBN's Secondary School Principals. The goal of the EECC is to promote a program which helps schools use energy efficiently. Our committee provides education regarding changes in behaviour of building users and changes in operational and maintenance routines that would translate into energy savings. Through basic changes in attitudes and behaviours, our collective environmental impact can be reduced and the District School Board of Niagara can reduce overall energy costs.

ECO Schools Program

Ontario Eco Schools is an environmental education and certification program for grades K-12 that helps school communities develop both ecological literacy and environmental practices to become environmentally responsible citizens and reduce the environmental footprint of schools. The key areas of focus and achievement are: Teamwork & Leadership, Energy Conservation, Waste Minimization, School Ground Greening and Curriculum, and Environmental Stewardship. Schools may use the program free of charge and are encouraged to implement the program at their own pace. All of the program guides and curriculum resources are available to download from this website. Schools may apply to be certified as an Eco School through an annual certification process which assesses and recognizes accomplishments awarding points in each of the six key areas.

In 2013-2014, a number of DSBN schools participated in the program. After a year of environmental initiatives in the areas of waste minimization, energy conservation, environmental literacy, the following Eco Teams were certified as Ontario Eco Schools:

Central Public School	Gold
Connaught Public School	Gold
Dalewood Public School	Silver
E.L. Crossley Secondary School	Gold
Glynn A Green Public School	Silver
Gracefield Public School	Gold
Lakeview Public School	Gold
Plymouth Public School	Silver
Princess Margaret Public School	Bronze
Quaker Road Public School	Gold

Ridgeway Crystal Beach Secondary School	Gold
Ridgeway Public School	Bronze
Smith Public School	Gold
Stamford Collegiate	Platinum
Victoria Public School	Silver
Winger Public School	Silver

In addition, the following schools will be receiving their 5 year seal:

- Glynn A. Green PS
- Ridgeway PS
- Smith PS
- Winger PS

The school base involvement with this program is a benefit to DSBN's Energy Conservation & Demand Management Plan. The plan is to continue encouraging this program in all schools.

Energy Use/Conservation Policy

The DSBN has adopted an Energy Use/Conservation Administrative Procedure. All staff, students and users of the District School Board of Niagara facilities are to follow the guidelines for the responsible and cost effective use of energy. Principals are expected to promote responsible energy use and conservation for staff and students and ensure Energy Use/Conservation Guidelines are followed in their school. Teachers, support staff and students are expected to promote energy awareness. Caretakers are expected to ensure all equipment operates within the limits of the guidelines. The specifics of the Energy Use/Conservation Policy are outlined in Appendix 'D'.

APPENDIX A

Energy Data

ENERGY CONSUMPTION

District School Board of Niagara –Energy Consumption				
Building Name	2011 Electricity Consumption (kWh)	2011 Natural Gas Consumption (m³)	2012 Electricity Consumption (kWh)	2012 Natural Gas Consumption (m³)
Don Reilly Resource Centre - closed	94,217	24,346	109,157	48,292
Education Centre	2,418,605	6,978	1,833,991	26,087
Niagara Falls Service Centre	109,434	14,686	47,329	18,156
School Support Services (former NDSS)	501,013	213,744	485,278	226,253
St. Catharines Service Centre	109,565	5,951	173,774	33,999
Welland Service Centre	65,279	7,004	64,641	8,241
St. Johns Outdoor Centre	9,139	-	10,014	
A K Wigg PS	115,940	33,016	115,549	39,713
Alexandra PS	169,756	31,365	188,058	34,566
Applewood PS	260,651	14,412	191,205	19,148
Battlefield PS - sold June 2012	70,051	40,922		
Bertie PS	251,995	25,307	279,547	28,711
Briardale PS	120,919	43,665	132,129	47,353
Burleigh Hill PS	103,043	41,892	97,923	46,256
Caistor Central PS	206,962	31,340	241,977	45,985
Campden PS - closed June 2013	84,000	21,813	93,951	26,283
Carleton PS	181,855	40,703	160,127	45,941
Central PS	157,185	47,583	203,605	85,013
Cherrywood Acres PS	115,562	38,485	108,701	48,469
College Street PS	165,303	40,220	162,162	50,713
Colonel John Butler PS - sold June 2012	17,879	20,264		
Connaught PS	397,920	171,997	386,983	78,440
Crossroads PS	340,126	14,135	326,897	226,139
Crowland Central PS - closed June 2013	67,266	23,168	64,655	26,652
Crystal Beach PS	126,059	44,935	126,969	54,300
Dalewood PS	137,349	42,259	135,791	48,375
DeWitt Carter PS	137,609	38,103	142,000	43,933
DSBN Academy (former Empire PS)	80,876	24,837	78,033	30,723
Diamond Trail PS			52,327	15,687
E I McCulley PS	212,145	13,033	213,940	15,886
E W Farr Memorial PS	52,456	14,775	52,996	18,043
Edith Cavell PS	308,217	66,245	307,917	82,939

District School Board of Niagara –Energy Consumption

Building Name	2011 Electricity Consumption (kWh)	2011 Natural Gas Consumption (m ³)	2012 Electricity Consumption (kWh)	2012 Natural Gas Consumption (m ³)
F J Rutland PS - closed June 2012	153,915	31,294	81,740	41,315
Ferndale PS	232,932	50,172	190,779	55,955
Fitch Street PS	100,011	35,017	101,872	44,016
Forestview PS	248,188	42,854	271,492	36,255
Fort Erie PS - closed June 2013	144,144	49,075	133,200	53,248
Gainsborough PS	55,879	42,170	59,585	46,849
Garrison Road PS	124,244	33,602	217,560	82,970
General Vanier PS	76,461	28,369	104,994	31,799
Glen Ridge PS	97,585	32,646	101,964	36,082
Glendale PS	72,975	29,066	74,638	36,172
Glynn A Green PS	147,373	35,422	155,913	48,574
Gordon PS	117,847	32,117	129,759	37,510
Gracefield PS	91,760	23,095	103,065	24,720
Grand Avenue PS	238,062	86,274	207,409	86,682
Grapeview PS	640,503	27,123	654,675	27,737
Greendale PS	153,942	38,748	162,397	48,767
Heximer Avenue PS	118,116	38,857	109,763	43,023
Jacob Beam PS	119,198	48,520	121,080	52,566
James Morden PS	191,353	51,242	171,902	51,047
John Marshall PS	141,261	39,951	142,268	43,537
Jordan PS - closed June 2013	97,682	28,163	96,724	32,570
Kate S. Durdan PS	664,808	116,481	636,413	115,401
Lakeview PS	142,771	49,278	137,177	57,688
Lincoln Centennial PS	135,559	34,081	139,182	41,990
Lockview PS	135,423	35,714	120,701	35,914
Maple Grove PS - closed June 2013	18,774	10,515	14,961	11,776
Martha Cullimore PS	96,919	38,982	84,672	33,321
Matthews PS - demolished August 2013	80,741	33,409	72,775	31,076
Maywood PS	87,148	26,312	85,209	29,696
McKay PS	149,448	51,836	159,000	56,287
Meadowvale PS	109,874	30,635	106,965	39,025
Memorial PS	157,086	42,481	189,623	46,194
Nelles PS	203,437	43,802	213,197	54,865
Oakridge PS	153,858	27,015	156,943	31,513
Oakwood PS	95,578	25,495	125,496	30,772
Ontario PS	164,479	29,944	162,825	34,085

District School Board of Niagara –Energy Consumption

Building Name	2011 Electricity Consumption (kWh)	2011 Natural Gas Consumption (m ³)	2012 Electricity Consumption (kWh)	2012 Natural Gas Consumption (m ³)
Orchard Park PS	223,403	49,465	218,013	55,740
Park PS	88,528	27,336	135,000	40,004
Parliament Oak PS	34,050	57,110	141,820	66,071
Parnall PS	143,884	61,298	146,969	76,131
Pelham Centre PS	136,573	7,372	176,047	8,070
Pine Grove PS	220,743	19,110	201,457	23,717
Plymouth PS	132,133	43,854	143,965	51,535
Port Weller PS	149,526	47,769	140,684	52,528
Power Glen PS	598,410	49,334	618,164	57,952
Prince of Wales PS	203,737	45,952	213,867	60,556
Prince of Wales PS	124,244	33,602	133,873	38,273
Prince Philip PS	153,785	73,964	193,458	50,023
Prince Philip PS	159,638	58,197	173,538	68,022
Princess Elizabeth PS	119,835	48,163	122,658	56,774
Princess Margaret PS	270,700	95,953	284,627	109,131
Quaker Road PS	177,267	38,370	187,892	42,490
Richmond Street PS	244,034	89,914	250,041	99,500
Ridgeway PS	130,042	30,135	181,567	42,164
River View PS	120,396	48,269	147,323	47,446
Rose Seaton PS	94,304	18,299	103,567	25,494
Ross PS	103,560	32,034	125,118	41,703
Senator Gibson PS	163,840	59,150	181,612	62,464
Sheridan Park PS	133,392	36,792	158,534	52,810
Simcoe Street PS	143,132	30,050	135,188	37,906
Smith PS	138,924	22,984	145,233	29,817
St Davids PS	179,636	58,508	173,272	48,308
Steele Street PS	128,663	32,465	132,080	44,815
Stevensville PS	251,080	50,179	225,480	54,972
Valley Way PS	92,876	36,240	87,523	34,913
Victoria PS	87,012	19,828	85,184	22,390
Vineland PS	70,798	39,660	82,827	53,863
Virgil PS - sold December 2011	-	7,837		
Westdale PS	183,717	43,322	176,052	52,328
Westmount PS	119,828	39,370	105,907	47,082
William E Brown PS	90,828	37,135	90,654	44,636
Winger PS	217,705	10,163	243,485	12,684

District School Board of Niagara –Energy Consumption

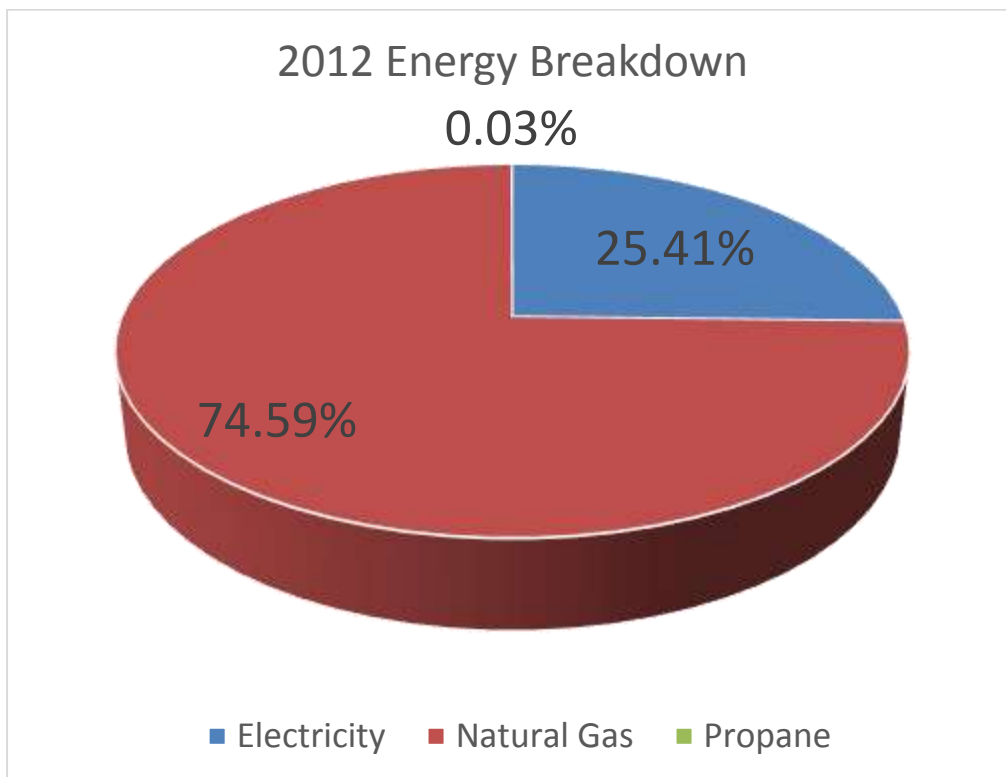
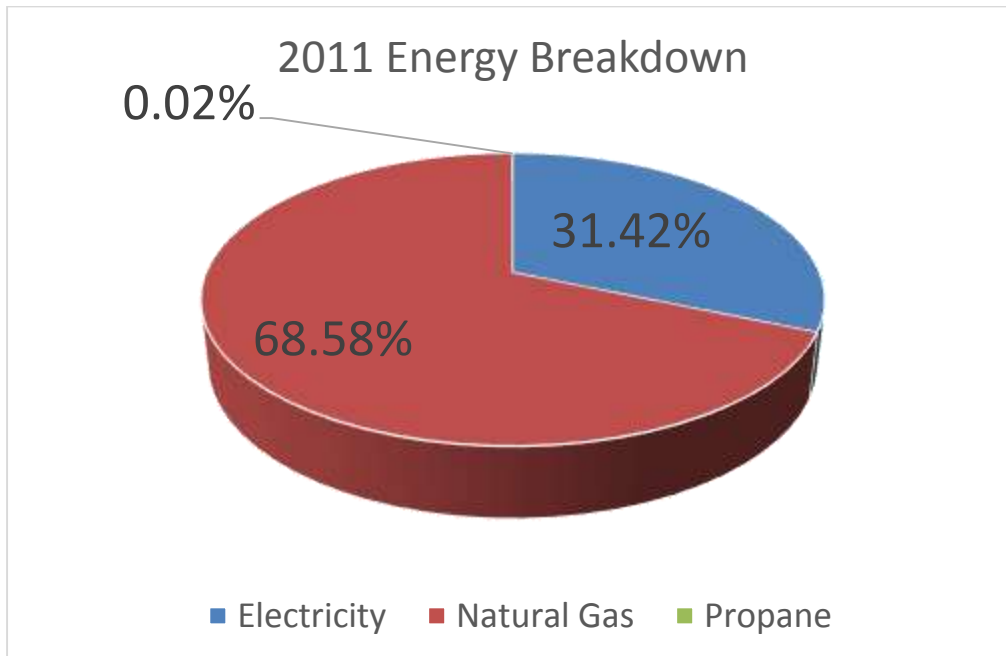
Building Name	2011 Electricity Consumption (kWh)	2011 Natural Gas Consumption (m ³)	2012 Electricity Consumption (kWh)	2012 Natural Gas Consumption (m ³)
Woodland PS	121,797	32,982	110,522	37,401
A N Myer SS	765,265	200,644	785,574	241,327
Beamsville District SS	440,636	260,140	450,902	290,169
E L Crossley SS	817,404	223,784	474,740	229,866
Eastdale SS	640,562	163,334	641,241	194,557
Eden HS	808,807	181,828	617,794	220,607
Fort Erie SS	781,104	224,583	797,760	239,928
Governor Simcoe SS	2,328,671	137,763	1,797,538	145,120
Grimsby SS	823,351	199,203	772,445	187,546
Kernahan Park SS - closed June 2013	688,046	159,411	659,113	174,406
Laura Secord SS	608,007	84,805	609,772	95,209
Lifetime Learning Centre	125,150	10,511	94,215	13,559
Port Colborne HS	791,771	220,862	758,000	234,408
Queen Mary PS & St Catharines Collegiate SS	1,161,012	252,566	1,508,399	293,487
Ridgeway-Crystal Beach HS	366,384	62,851	427,681	80,576
Sir Winston Churchill SS	1,533,059	108,384	1,446,609	118,374
South Lincoln HS	158,819	89,290	151,348	70,357
Stamford Collegiate	896,075	200,886	851,901	236,287
Thorold SS	491,401	160,973	305,332	157,182
Welland Centennial SS	1,159,186	189,165	1,124,873	209,037
West Park SS	2,348,313	129,843	1,299,403	164,315
Westlane SS	528,922	179,783	334,464	216,321
TOTAL	36,961,674	7,589,711	34,467,853	8,693,649

APPENDIX B

Energy Use Breakdown



ENERGY USE BREAKDOWN



APPENDIX C

Energy Conservation Measure Schedules

District School Board of Niagara Energy Management Strategies

		Annual Energy Savings				Annual Savings					
EMS #	Opportunity	Electricity (kWh/yr.)	Electricity Demand (kW/yr.)	Natural Gas (m ³ /yr.)	Water (m ³ /yr.)	Estimated Installation Cost (\$)	Incentives (\$)	Estimated Cost with Incentives (\$)	Total Energy Savings (\$)	Payback Period (years)	tCO2e Savings
EMS 01	Science Lab Retrofit (Eden HS)	83,335	10	15,944		\$500,000		\$500,000	\$14,286	35	
EMS 02	Science Lab Retrofit (E.I. Crossley SS)	41,667	5	7,972		\$250,000		\$250,000	\$7,143	35	
EMS 03	Science Lab Retrofit (Westlane SS)	83,335	10	15,944		\$500,000		\$500,000	\$14,286	35	
EMS 04	Science Lab Retrofit (Thorold)	83,335	10	15,944		\$500,000		\$500,000	\$14,286	35	
EMS 05	Science Lab Retrofit (Centennial HS)	41,667	5	7,972		\$250,000		\$250,000	\$7,143	35	
EMS 06	Science Lab Retrofit (Eastdale HS)	83,335	10	15,944		\$500,000		\$500,000	\$14,286	35	
EMS 07	Heating Plant Upgrade (Applewood PS)			20,000		\$100,000	\$400	\$99,600	\$5,000	20	
EMS 08	Heating Plant Upgrade (Pine Grove PS)			20,000		\$100,000	\$400	\$99,600	\$5,000	20	
EMS 09	Heating Plant Upgrade (Steele Street PS)			20,000		\$70,000	\$400	\$69,600	\$3,500	20	
EMS 10	Lighting Retrofit (Ontario PS)	166,500	10			\$20,000	\$400	\$19,600	\$2,000	10	
EMS 11	Lighting Retrofit (Prince Phillip PS)	499,500	30			\$60,000	\$400	\$59,600	\$6,000	10	
EMS 12	Lighting Retrofit (Princess Elizabeth PS)	166,500	10			\$60,000	\$400	\$59,600	\$2,000	30	
EMS 13	Exterior Entrance Improvement (Dalewood PS)	10,000	1	1,600		\$40,000		\$40,000	\$1,600	25	
EMS 14	Exterior Entrance Improvement & Exterior Door Replacement (Lakeview PS)	5,000	0.5	1,600		\$20,000		\$20,000	\$800	25	
EMS 15	Exterior Entrance Improvement (Ross PS)	25,000	2.5	4,000		\$100,000		\$100,000	\$4,000	25	
EMS 16	Exterior Entrance Improvement (Westlane SS)	37,500	3	6,000		\$150,000		\$150,000	\$6,000	25	
EMS 17	Exterior Entrance Improvement (Governor Simcoe SS)	37,500	3	6,000		\$150,000		\$150,000	\$6,000	25	
EMS 18	Exterior Entrance Improvement (Stamford Collegiate)	156,250	4	25,000		\$1,000,000		\$1,000,000	\$25,000	40	
EMS 19	Window Replacement (Princess Margaret PS)	23,437	2	3,750		\$75,000		\$75,000	\$3,750	20	
EMS 20	Window Replacement (Grimsby SS)	109,375	10	17,500		\$350,000		\$350,000	\$17,500	20	
EMS 21	Energy Audit (Bertie PS)					\$7,500		\$7,500	\$0	0	
EMS 22	Energy Audit (Ridgeway PS)					\$7,500		\$7,500	\$0	0	
EMS 23	Energy Audit (Crystal Beach PS)					\$7,500		\$7,500	\$0	0	
	GRAND TOTAL	1,653,236	126	205,170		\$4,817,500	\$2,400	4,815,100	\$143,044	34	

District School Board of Niagara Projected Energy Conservation Savings and Investment

EMS	Savings	2013/2014	2014/2015	2015/2067	2016/2017	2017/2018	2018/2019	20219/2020	2020/2012	2021/2022	2022/2023	TOTAL
EMS 01	Science Lab Retrofit (Eden HS)		\$14,286	\$14,572	\$14,863	\$15,160	\$15,464	\$15,773	\$16,088	\$16,410	\$16,738	\$139,355
EMS 02	Science Lab Retrofit (E.I. Crossley SS)		\$7,143	\$7,286	\$7,432	\$7,580	\$7,732	\$7,886	\$8,044	\$8,205	\$8,369	\$69,677
EMS 03	Science Lab Retrofit (Westlane SS)			\$14,286	\$14,572	\$14,863	\$15,160	\$15,464	\$15,773	\$16,088	\$16,410	\$122,616
EMS 04	Science Lab Retrofit (Thorold)				\$14,286	\$14,572	\$14,863	\$15,160	\$15,464	\$15,773	\$16,088	\$106,206
EMS 05	Science Lab Retrofit (Centennial HS)	\$7,143	\$7,286	\$7,432	\$7,580	\$7,732	\$7,886	\$8,044	\$8,205	\$8,369	\$8,537	\$78,214
EMS 06	Science Lab Retrofit (Eastdale HS)					\$14,286	\$14,572	\$14,863	\$15,160	\$15,464	\$15,773	\$90,118
EMS 07	Heating Plant Upgrade (Applewood PS)		\$5,000	\$5,100	\$5,202	\$5,306	\$5,412	\$5,520	\$5,631	\$5,743	\$5,858	\$48,773
EMS 08	Heating Plant Upgrade (Pine Grove PS)		\$5,000	\$5,100	\$5,202	\$5,306	\$5,412	\$5,520	\$5,631	\$5,743	\$5,858	\$48,773
EMS 09	Heating Plant Upgrade (Steele Street PS)		\$3,500	\$3,570	\$3,641	\$3,714	\$3,789	\$3,864	\$3,942	\$4,020	\$4,101	\$34,141
EMS 10	Lighting Retrofit (Ontario PS)		\$2,000	\$2,040	\$2,081	\$2,122	\$2,165	\$2,208	\$2,252	\$2,297	\$2,343	\$19,509
EMS 11	Lighting Retrofit (Prince Phillip PS)		\$6,000	\$6,120	\$6,242	\$6,367	\$6,495	\$6,624	\$6,757	\$6,892	\$7,030	\$58,528
EMS 12	Lighting Retrofit (Princess Elizabeth PS)		\$2,000	\$2,040	\$2,081	\$2,122	\$2,165	\$2,208	\$2,252	\$2,297	\$2,343	\$19,509
EMS 13	Exterior Entrance Improvement (Dalewood PS)		\$1,600	\$1,632	\$1,665	\$1,698	\$1,732	\$1,767	\$1,802	\$1,838	\$1,875	\$15,607
EMS 14	Exterior Entrance Improvement & Exterior Door Replacement (Lakeview PS)		\$800	\$816	\$832	\$849	\$866	\$883	\$901	\$919	\$937	\$7,804
EMS 15	Exterior Entrance Improvement (Ross PS)		\$4,000	\$4,080	\$4,162	\$4,245	\$4,330	\$4,416	\$4,505	\$4,595	\$4,687	\$39,019
EMS 16	Exterior Entrance Improvement (Westlane SS)		\$6,000	\$6,120	\$6,242	\$6,367	\$6,495	\$6,624	\$6,757	\$6,892	\$7,030	\$58,528
EMS 17	Exterior Entrance Improvement (Governor Simcoe SS)		\$6,000	\$6,120	\$6,242	\$6,367	\$6,495	\$6,624	\$6,757	\$6,892	\$7,030	\$58,528
EMS 18	Exterior Entrance Improvement (Stamford Collegiate)		\$25,000	\$25,500	\$26,010	\$26,530	\$27,061	\$27,602	\$28,154	\$28,717	\$29,291	\$243,866
EMS 19	Window Replacement (Princess Margaret PS)		\$3,750	\$3,825	\$3,902	\$3,980	\$4,059	\$4,140	\$4,223	\$4,308	\$4,394	\$36,580
EMS 20	Window Replacement (Grimsby SS)		\$17,500	\$17,850	\$18,207	\$18,571	\$18,943	\$19,321	\$19,708	\$20,102	\$20,504	\$170,706
EMS 21	Energy Audit (Bertie PS)	\$500	\$510	\$520	\$531	\$541	\$552	\$563	\$574	\$586	\$598	\$5,475
EMS 22	Energy Audit (Ridgeway PS)	\$500	\$510	\$520	\$531	\$541	\$552	\$563	\$574	\$586	\$598	\$5,475
EMS 23	Energy Audit (Crystal Beach PS)	\$500	\$510	\$520	\$531	\$541	\$552	\$563	\$574	\$586	\$598	\$5,475
	Total Savings	\$8,643	\$118,395	\$135,049	\$152,036	\$169,362	\$172,750	\$176,205	\$179,729	\$183,323	\$186,990	\$1,482,481

APPENDIX D

Energy Use Policy

District School Board of Niagara

ADMINISTRATIVE PROCEDURE

SECTION:	GENERAL SCHOOL OPERATIONS	A.P. NO.:	1-23
TOPIC:	ENERGY USE/CONSERVATION	PAGE:	1 of 2
		DATE:	April 2010
REVIEW	April 2015	REVISED:	

All staff, students and users of District School Board of Niagara facilities are to follow the guidelines below for the responsible and cost effective use of energy. In order to implement these guidelines:

- Principals are expected to promote responsible energy use and conservation for staff and students, and ensure Energy Use/Conservation Guidelines are followed in their school.
- Teachers, Support Staff and students are expected to promote energy awareness.
- Caretakers are expected to ensure all equipment operates within the limits of this guideline.

1. TEMPERATURE SETTINGS

(a) **Heating:** All thermostats (programmed and manual) shall be set **not more** than the following:

Classrooms.....	21° C (70° F)
Secondary School Shops.....	20° C (68° F)
Gymnasiums.....	19° C (66° F)
Change rooms, Washrooms and Corridors	20° C (68° F)
Night Setbacks.....	16° C (61° F)

(b) **Cooling:** All areas to be set **not less** than 25° C (77° C).

2. OPERATION OF HEATING SYSTEMS

Generally, heating systems should be operational starting the second week of October until the third week of May. The following criteria shall be used in starting up and shutting down heating systems:

- (a) **Start Up:** At 8:00 a.m., outdoor temperature is 12° C. (54° F.) and at the same time, the interior building temperature is 18° C. (65° F.) or less.
- (b) **Shutdown:** When, for a period of at least three days, the outdoor temperature exceeds 23° C. (75° F.)

3. OPERATION OF AIR CONDITIONING

(a) Generally, air conditioning will only be permitted in the following areas:

- School Administrative Offices
- Computer Labs
- Library Resource Centres

- (b) Any new air conditioning installations must have prior approval of the Plant Services Controller and the Area Superintendent through Administrative Procedure: School Initiated Alteration Projects.
- (c) All air conditioning in schools should be shut down at the end of the first week in July and not restarted until the last week of August, except for schools where Summer School is run.

District School Board of Niagara

ADMINISTRATIVE PROCEDURE

SECTION:	GENERAL SCHOOL OPERATIONS	A.P. NO.:	1-23
TOPIC:	ENERGY USE/CONSERVATION	PAGE:	2 of 2
		DATE:	April 2010
REVIEW	April 2015	REVISED:	

4. OPERATION OF COMPUTERS AND AUDIO VISUAL EQUIPMENT

- (a) Computers, monitors and printers should be shut down at the end of each day, both in offices and classroom settings.
- (b) Computers and peripherals should be shut down when they will not be used for more than one hour. An evening time shutdown is set for 4:30 p.m. everyday with override options if required.
- (c) Power saving software is installed on all computers. If the computer is not in use for more than one hour, a warning will appear stating that in 15 minutes a computer energy savings shutdown will occur. The user has the option to override this shutdown by simply replying no to the message if the computer is still in use.
- (d) Extension cords and power bars should not be used. If no other solution is feasible, a 14 gauge cord is strongly recommended.
- (e) Three-prong plugs must be left intact.
- (f) Audio Visual equipment should be turned off when not in use.

5. GENERAL ENERGY CONSERVATION STRATEGIES

- (a) Turn off lighting in rooms when vacating for five minutes or more.
- (b) Turn off interior corridor, washroom, and changeroom lighting at the end of each day.
- (c) At the end of the school year, fridges and freezers are to be cleaned out and turned off.
- (d) At the end of the school year, pop machines are to be turned off.
- (e) Consider closing curtains at the end of a school day.
- (f) Keep spaces around vents on walls and window sills free of obstructions.
- (g) Exterior lights be programmed to turn off no later than 12:00 a.m. and turn on no earlier than 6:00 a.m.
- (h) Air handling equipment shall be programmed and operated to shutdown when the building is not occupied.
- (i) Open curtains and shut off lights during the school day when and where appropriate.

6. PREVENTATIVE MAINTENANCE

- (a) Monthly Facility Preventative Maintenance must be undertaken on equipment as scheduled to ensure optimum energy efficiency.
- (b) Re-lamping of all light fixtures and cleaning of lenses should be undertaken on a regular basis to ensure optimum energy efficiency of lighting systems and proper light levels are maintained for learning environments.
- (c) Heating and ventilation system coils should be thoroughly cleaned on a regular basis to ensure optimum efficiency of heating and ventilation systems to reduce energy consumption and to ensure a clean, healthy environment for learning.

Reference

- Administrative Procedure 1-5: School Initiated Alteration Projects