AVON MAITLAND DISTRICT SCHOOL BOARD

- We Will: ***Create Positive, Inclusive Learning Environments***
- We Will: ***Maximize Student Outcomes***
- By Valuing: ***Our students, Our Staff, Our Families, Our Communities***
- Using Principles of: ***Character, Equity, Sustainability***

DIRECTOR'S REPORT

TO: ○ **C/W, Closed Session** ● **C/W, Open Session** ○ **Board**

TUESDAY, JUNE 24, 2014 **AGENDA ITEM 3.2.1**

SUBJECT: **Green Energy Act – Phase I and Phase II Reporting**

1.0 Background

1.1 Under the *Green Energy Act*, Ontario Regulation 397/11, Energy Conservation and Demand Management Plans, defines the requirements for all Broader Public Sector (BPS) organizations, including hospitals, municipalities, universities, colleges, school boards and municipal service boards (for water and sewage treatment and pumping operations), to:

1.1.1 Report on annual energy use and greenhouse gas (GHG) emissions in designated buildings/facilities by July 1, 2013. (This was completed and reported to the Board on June 25, 2013.)

1.1.2 Develop and implement 5-year Energy Conservation and Demand management plans (CDM) plans by July 1, 2014.

1.2 The regulation also requires that the document be made public and easily available on our web site as well as internally.

1.3 The ultimate goal of the reporting tool is to calculate the Green House Gas (GHG) emission volume in kilograms for each individual building in an organization's inventory in an effort to establish baseline data for future reduction targets.

1.4 To accomplish this, a GHG factor is applied to the data accumulated for each energy source in each facility in the reporting period.

1.5 Using the same data, the report also calculates energy use per square foot and is reported in equivalent kilowatt-hours per square foot (ekWh/ft^2) which is a standard measure when comparing total energy intensity of a building.

1.6 The data used to populate this report is dependent on Local Distribution Companies (LDC) reporting the meter data accurately by having all adjustments to 'actual' made for estimated readings within the reporting period. This is not coordinated well at this time and, in some cases, current building data may reflect energy and GHG's lower or higher than actual. Propane is another heating fuel used at 5 sites. Propane is delivered in bulk and not metered over a specific billing period in the same fashion as electrical and natural gas utilities. As such, the propane volume used to calculate GHG's and energy intensities is based on bulk deliveries billed in the fiscal period.

2.0 Energy Consumption and Green House Gas (GHG) Emissions Reporting

2.1 Appendix A-1 represents the data to be uploaded to the Ministry of Energy web site on or before July 1, 2014 and is organized alphabetically by school name. This appendix includes the volumes of fuels used at each site which in turn calculates the GHG's and energy intensity following the Ministry of Energy template.

2.2 When comparing data to the previous year it must be considered that the data is raw and not corrected for heating degree days or cooling degree days.

2.3 Appendix A-2 represents the same data organized from lowest to highest energy intensity. It will be noticed that Listowel District Secondary has the highest intensity by 4 ekWh/ft^2 over the next highest. Listowel has undergone extensive open renovations over the last couple of years which requires a greater amount of heating fuel because of the amount of fresh air entering the building. We would expect that the energy intensity of LDSS to return to the 2011/2012 value of approximately 20 ekWh/ft^2 in the 2014/2015 usage year. As such, leaving LDSS out of the analysis, the results do not vary greatly from the previous year's reporting period. Energy intensity in our buildings for fiscal 2012/2013 ranges from 13 to 25 ekWh/ft^2 where as in 2011/2012 the range was from 10 to 24 ekWh/ft^2.

2.4 It can also be noticed that the lowest energy intensity occurred at Shakespeare and Hamlet Public Schools. The building attributes of two storeys and relatively small overall exterior window area affect the positive ranking of these sites. These same schools had the lowest energy intensity in the previous reporting period.

2.5 Appendix A-3 represents the same data organized numerically from lowest to highest GHG emissions. Lowest energy intensity does not necessarily translate to lowest emissions. The Ministry of Energy assumes that each energy type produces a certain number of GHG's per ekWh consumed. You will notice that while North Woods Elementary is middle of the range for energy intensity, it is the second lowest for GHG emissions. This results from the fact that it is an electrically heated school and the GHG's per kWh of electricity are considerably lower than that of heating fuels like propane or natural gas.

3.0 Energy Consumption and Demand Management Plan

3.1 Board staff participated in a working group through OASBO's Operations Maintenance Construction (OMC) Subcommittee on Energy to produce a template that would allow boards to produce an Energy and Demand Management Plan that meets the requirements of the Green Energy Act – Phase I and Phase II Reporting.

3.2 Appendix B is the result of this work including the addition of Avon Maitland specific information.

3.3 Section 1 of the Plan outlines some details regarding the education sectors challenges and variables related to energy consumption.

3.4 Section 2 outlines high level statistics about the board.

3.5 Section 3 and 4 reports the 2 year historical consumption as well as the conservation goals for the next 5 years. The plan assumes an overall reduction target in energy consumption of 16% at the end of 5 years compared to the 2012/2013 consumption.

3.6 Section 5 and 6 outlines the strategies to be employed by the board to meet the goals projected in section 4.

Janet Baird-Jackson
Superintendent of Business
and Treasurer

Ted Doherty
Director of Education and
Secretary of the Board

Press TAB to move to input areas. Press UP or DOWN ARROW in column A to read through the document.

Energy Consumption and Greenhouse Gas Emissions Reporting - for 2012

Appendix A1 - Green Energy Act Reporting
DIR June 24, 2014 - Alphabetical by School

Confirm consecutive 12-mth period (mth-yr to mth-yr)

Sector

Agency Sub-sector

Organization Name

Operation Name	City	Postal Code	Total Floor Area	Unit	Avg hrs/wk	Swimming Pool (Y/N)	Number of Portables	Energy Type and Amount Purchased and Consumed in Natural Units						Total (calculated in webform)		Building / Operation Identifier	Comments
								Electricity		Natural Gas		Propane					
								Quantity	Unit	Quantity	Unit	Quantity	Unit	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)		
Anne Hathaway Public School	Stratford	N5A 4A2	51946.6327	Square feet	60	No	0	556361	kWh	33881	Cubic Meter	0	Litre	117490	18		
Avon PS	Stratford	N5A 6N7	30903.18829	Square feet	60	No	0	235467	kWh	32273	Cubic Meter	0	Litre	83631	19		
Bedford PS	Stratford	N5A 5J7	36984.8	Square feet	60	No	0	286294	kWh	27278	Cubic Meter	0	Litre	79067	16		
Bluewater Coast ES	Hensall	N0M 1X0	24164.97051	Square feet	60	No	0	97473	kWh	31671	Cubic Meter	0	Litre	69239	18		
Brookside PS	Lucknow	N0G 2H0	28050.62	Square feet	60	No	0	109592	kWh	0	Cubic Meter	66547	Litre	113073	21		Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
Central Huron SS	Clinton	N0M 1L0	144925.3	Square feet	80	No	0	866234	kWh	235283	Cubic Meter	0	Litre	528025	23		
Central Perth E S	Sebringville	N0K 1X0	29999.01724	Square feet	60	No	0	591680	kWh	0	Cubic Meter	0	Litre	56825	20		
Clinton Administration	Clinton	N0M 1L0	12895.16	Square feet	80	No	0	77076	kWh	20935	Cubic Meter	0	Litre	46983	23		
Clinton PS	Clinton	N0M 1L0	42872.66056	Square feet	60	No	0	304727	kWh	65045	Cubic Meter	0	Litre	152242	23		
Colborne Central PS - Victoria Campus - Holding Sch	Goderich	N7A 3J5	44584.11984	Square feet	60	No	0	173303	kWh	80116	Cubic Meter	0	Litre	168113	23		
Downie Central PS	St. Pauls	N0K 1V0	21671.51387	Square feet	60	No	2	169726	kWh	34399	Cubic Meter	0	Litre	81336	25		
Elma Township	Atwood	N0G 1B0	36780.28	Square feet	60	No	0	250408	kWh	35832	Cubic Meter	0	Litre	91795	17		
Exeter ES	Exeter	N0M 1S1	39826.47	Square feet	60	No	0	212882	kWh	51959	Cubic Meter	0	Litre	118680	19		
F E Madill SS & ES	Wingham	N0G 2W0	189186.4816	Square feet	80	No	0	1134016	kWh	272241	Cubic Meter	0	Litre	623618	21		
Goderich District CI & Goderich District CI Elementa	Goderich	N7A 3M5	115948.8435	Square feet	80	No	0	730500	kWh	157867	Cubic Meter	0	Litre	368625	21		
Goderich Public School	Goderich	N7A 1Z1	45703.56317	Square feet	60	No	0	277070	kWh	65829	Cubic Meter	0	Litre	151068	21		
Hamlet PS	Stratford	N5A 7N4	30171.24	Square feet	60	No	0	197595	kWh	17875	Cubic Meter	0	Litre	52772	13		
Holmesville PS	Clinton	N0M 1L0	20699	Square feet	60	No	0	86534	kWh	22797	Cubic Meter	0	Litre	51411	16		
Howick Central S	Gorrie	N0G 1X0	32894.51	Square feet	60	No	0	285887	kWh	0	Cubic Meter	62778	Litre	124196	22		Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
Hullett Central PS	Londesboro	N0M 2H0	22345.88	Square feet	60	No	0	132679	kWh	33253	Cubic Meter	0	Litre	75611	22		
Huron Centennial S	Brucefield	N0M 1J0	37505.22672	Square feet	60	No	1	292029	kWh	56072	Cubic Meter	0	Litre	134058	24		
Listowel Central PS	Listowel	N4W 1G4	36220.55765	Square feet	60	No	0	203036	kWh	43014	Cubic Meter	0	Litre	100822	18		
Listowel DSS	Listowel	N4W 2M4	154516.9816	Square feet	80	No	6	1053574	kWh	316981	Cubic Meter	0	Litre	700478	29		Significant open renovations during heating season.
Listowel Eastdale PS	Listowel	N4W 2M3	23954.32955	Square feet	60	No	0	162623	kWh	32825	Cubic Meter	0	Litre	77678	21		
Little Falls PS	St. Marys	N4X 1B6	41434.05605	Square feet	60	No	1	340460	kWh	44746	Cubic Meter	0	Litre	117295	20		
Milverton PS	Milverton	N0K 1M0	34164.65	Square feet	60	No	0	227164	kWh	0	Cubic Meter	90770	Litre	161692	25		Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
Mitchell DHS	Mitchell	N0K 1N0	87503.5942	Square feet	80	No	1	302784	kWh	149830	Cubic Meter	0	Litre	312351	22		
Mornington Central PS	Newton	N0K 1R0	13634.64	Square feet	60	No	2	103840	kWh	0	Cubic Meter	34331	Litre	62876	25		Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
North Easthope PS	Stratford	N5A 6S2	23282.34	Square feet	60	No	0	136225	kWh	0	Cubic Meter	42443	Litre	78487	19		Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
North Woods ES	Ethel	N0G 1T0	21883.02955	Square feet	60	No	0	410428	kWh	0	Cubic Meter	0	Litre	39418	19		
Romeo PS	Stratford	N5A 3P2	20731.29078	Square feet	60	No	0	140090	kWh	28516	Cubic Meter	0	Litre	67367	21		
Seaforth PS	Seaforth	N0K 1W0	48641.59	Square feet	80	No	0	366043	kWh	62159	Cubic Meter	0	Litre	152674	21		
Seaforth PS & Administration & Maintenance	Seaforth	N0K 1W0	27857.41	Square feet	80	No	0	209636	kWh	35599	Cubic Meter	0	Litre	87437	21		
SERC Library & Day Care	Stratford	N5A 6R7	19192.72	Square feet	80	No	0	230785	kWh	21762	Cubic Meter	0	Litre	63309	24		
Shakespeare PS	Stratford	N5A 2B8	25155.258	Square feet	60	No	0	251899	kWh	6251	Cubic Meter	0	Litre	36011	13		
South Huron DHS & DES	Exeter	N0M 1S6	127864.4959	Square feet	80	No	0	752356	kWh	210950	Cubic Meter	0	Litre	471084	23		
South Perth Centennial PS	St. Marys	N4X 1C4	25951.78771	Square feet	60	No	0	104833	kWh	36478	Cubic Meter	0	Litre	79034	19		
Sprucedale PS	Shakespeare	N0B 2P0	19791.59429	Square feet	60	No	2	105145	kWh	28151	Cubic Meter	0	Litre	63321	20		
St Marys DC & VI & Elementary	St. Marys	N4X 1B6	101751.2434	Square feet	80	No	0	584643	kWh	148322	Cubic Meter	0	Litre	336571	21		
Stephen Central PS	Crediton	N0M 1M0	22410.46107	Square feet	60	No	0	112801	kWh	36144	Cubic Meter	0	Litre	79168	22		
Stratford Central	Stratford	N5A 1A3	136856.0504	Square feet	80	No	1	771890	kWh	140187	Cubic Meter	0	Litre	339173	17		
Stratford Northwestern	Stratford	N5A 6R7	167652.1849	Square feet	80	No	4	1052278	kWh	289405	Cubic Meter	0	Litre	648218	25		
Turnberry Central PS	Wingham	N0G 2W0	15984.40742	Square feet	60	No	0	134277	kWh	22466	Cubic Meter	0	Litre	55372	23		
Upper Thames E S	Mitchell	N0K 1N0	67873.97615	Square feet	80	No	2	804744	kWh	77582	Cubic Meter	0	Litre	223967	24		
Wallace PS	Gowanstow	N0G 1Y0	26005.60709	Square feet	60	No	0	178042	kWh	38376	Cubic Meter	0	Litre	89653	23		
Wingham PS - Holding School	Wingham	N0G 2W0	30440.33913	Square feet	60	No	0	103685	kWh	46007	Cubic Meter	0	Litre	96940	19		

Press TAB to move to input areas. Press UP or DOWN ARROW in column A to read through the document.

Energy Consumption and Greenhouse Gas Emissions Reporting - for 2012

Appendix A2 - Green Energy Act Reporting
DIR June 24, 2014 - Numeric by Energy Intensity

Confirm consecutive 12-mth period (mth-yr to mth-yr)

Sector

Agency Sub-sector

Organization Name

Operation Name	City	Total Floor Area	Unit	Total (calculated in webform) GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Comments
Shakespeare PS	Stratford	25155.258	Square feet	36011	13	
Hamlet PS	Stratford	30171.24	Square feet	52772	13	
Bedford PS	Stratford	36984.8	Square feet	79067	16	
Holmesville PS	Clinton	20699	Square feet	51411	16	
Stratford Central	Stratford	136856.0504	Square feet	339173	17	
Elma Township	Atwood	36780.28	Square feet	91795	17	
Anne Hathaway Public School	Stratford	51946.6327	Square feet	117490	18	
Bluewater Coast ES	Hensall	24164.97051	Square feet	69239	18	
Listowel Central PS	Listowel	36220.55765	Square feet	100822	18	
North Easthope PS	Stratford	23282.34	Square feet	78487	19	Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
Avon PS	Stratford	30903.18829	Square feet	83631	19	
North Woods ES	Ethel	21883.02955	Square feet	39418	19	
South Perth Centennial PS	St. Marys	25951.78771	Square feet	79034	19	
Exeter ES	Exeter	39826.47	Square feet	118680	19	
Wingham PS - Holding School	Wingham	30440.33913	Square feet	96940	19	
Little Falls PS	St. Marys	41434.05605	Square feet	117295	20	
Central Perth E S	Sebringville	29999.01724	Square feet	56825	20	
Sprucedale PS	Shakespeare	19791.59429	Square feet	63321	20	
Brookside PS	Lucknow	28050.62	Square feet	113073	21	Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
Goderich District CI & Goderich District CI Elementa	Goderich	115948.8435	Square feet	368625	21	
Seaforth PS	Seaforth	48641.59	Square feet	152674	21	
Seaforth PS & Administration & Maintenance	Seaforth	27857.41	Square feet	87437	21	
St Marys DC & VI & Elementary	St. Marys	101751.2434	Square feet	336571	21	
F E Madill SS & ES	Wingham	189186.4816	Square feet	623618	21	
Listowel Eastdale PS	Listowel	23954.32955	Square feet	77678	21	
Goderich Public School	Goderich	45703.56317	Square feet	151068	21	
Romeo PS	Stratford	20731.29078	Square feet	67367	21	
Mitchell DHS	Mitchell	87503.5942	Square feet	312351	22	
Hullett Central PS	Londesboro	22345.88	Square feet	75611	22	
Howick Central S	Gorrie	32894.51	Square feet	124196	22	Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
Stephen Central PS	Crediton	22410.46107	Square feet	79168	22	
Wallace PS	Gowanstow	26005.60709	Square feet	89653	23	
Colborne Central PS - Victoria Campus - Holding Sch	Goderich	44584.11984	Square feet	168113	23	
Clinton Administration	Clinton	12895.16	Square feet	46983	23	
Central Huron SS	Clinton	144925.3	Square feet	528025	23	
Clinton PS	Clinton	42872.66056	Square feet	152242	23	
Turnberry Central PS	Wingham	15984.40742	Square feet	55372	23	
South Huron DHS & DES	Exeter	127864.4959	Square feet	471084	23	
Huron Centennial S	Brucefield	37505.22672	Square feet	134058	24	
Upper Thames E S	Mitchell	67873.97615	Square feet	223967	24	
SERC Library & Day Care	Stratford	19192.72	Square feet	63309	24	
Stratford Northwestern	Stratford	167652.1849	Square feet	648218	25	
Downie Central PS	St. Pauls	21671.51387	Square feet	81336	25	
Mornington Central PS	Newton	13634.64	Square feet	62876	25	Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
Milverton PS	Milverton	34164.65	Square feet	161692	25	Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
Listowel DSS	Listowel	154516.9816	Square feet	700478	29	Significant open renovations during heating season.

Press TAB to move to input areas. Press UP or DOWN ARROW in column A to read through the document.

Energy Consumption and Greenhouse Gas Emissions Reporting - for 2012

Appendix A3 - Green Energy Act Reporting
DIR June 24, 2014 - Numeric by GHG Emission

Confirm consecutive 12-mth period (mth-yr to mth-yr)

Sector

Agency Sub-sector

Organization Name

Operation Name	City	Total Floor Area	Unit	Total (calculated in webform) GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Comments
Shakespeare PS	Stratford	25155.258	Square feet	36011	13	
North Woods ES	Ethel	21883.02955	Square feet	39418	19	
Clinton Administration	Clinton	12895.16	Square feet	46983	23	
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Turnberry Central PS	Wingham	15984.40742	Square feet	55372	23	
Central Perth E S	Sebringville	29999.01724	Square feet	56825	20	
Mornington Central PS	Newton	13634.64	Square feet	62876	25	Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
SERC Library & Day Care	Stratford	19192.72	Square feet	63309	24	
Sprucedale PS	Shakespeare	19791.59429	Square feet	63321	20	
Romeo PS	Stratford	20731.29078	Square feet	67367	21	
Bluewater Coast ES	Hensall	24164.97051	Square feet	69239	18	
Hullett Central PS	Londesboro	22345.88	Square feet	75611	22	
Listowel Eastdale PS	Listowel	23954.32955	Square feet	77678	21	
North Easthope PS	Stratford	23282.34	Square feet	78487	19	Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
South Perth Centennial PS	St. Marys	25951.78771	Square feet	79034	19	
Bedford PS	Stratford	36984.8	Square feet	79067	16	
Stephen Central PS	Crediton	22410.46107	Square feet	79168	22	
Downie Central PS	St. Pauls	21671.51387	Square feet	81336	25	
Avon PS	Stratford	30903.18829	Square feet	83631	19	
Seaforth PS & Administration & Maintenance	Seaforth	27857.41	Square feet	87437	21	
Wallace PS	Gowanstow	26005.60709	Square feet	89653	23	
Elma Township	Atwood	36780.28	Square feet	91795	17	
Wingham PS - Holding School	Wingham	30440.33913	Square feet	96940	19	
Listowel Central PS	Listowel	36220.55765	Square feet	100822	18	
Brookside PS	Lucknow	28050.62	Square feet	113073	21	Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
Little Falls PS	St. Marys	41434.05605	Square feet	117295	20	
Anne Hathaway Public School	Stratford	51946.6327	Square feet	117490	18	
Exeter ES	Exeter	39826.47	Square feet	118680	19	
Howick Central S	Gorrie	32894.51	Square feet	124196	22	Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
Huron Centennial S	Brucefield	37505.22672	Square feet	134058	24	
Goderich Public School	Goderich	45703.56317	Square feet	151068	21	
Clinton PS	Clinton	42872.66056	Square feet	152242	23	
Seaforth PS	Seaforth	48641.59	Square feet	152674	21	
Milverton PS	Milverton	34164.65	Square feet	161692	25	Emissions and Energy Intensity are based on bulk propane deliveries made in the reporting period and do not reflect the actual withdrawal of fuel in the reporting period. This has the effect of inflating or deflating reported values.
Colborne Central PS - Victoria Campus - Holding Sch	Goderich	44584.11984	Square feet	168113	23	
Upper Thames E S	Mitchell	67873.97615	Square feet	223967	24	
Mitchell DHS	Mitchell	87503.5942	Square feet	312351	22	
St Marys DC & VI & Elementary	St. Marys	101751.2434	Square feet	336571	21	
Stratford Central	Stratford	136856.0504	Square feet	339173	17	
Goderich District CI & Goderich District CI Elementa	Goderich	115948.8435	Square feet	368625	21	
South Huron DHS & DES	Exeter	127864.4959	Square feet	471084	23	
Central Huron SS	Clinton	144925.3	Square feet	528025	23	
F E Madill SS & ES	Wingham	189186.4816	Square feet	623618	21	
Stratford Northwestern	Stratford	167652.1849	Square feet	648218	25	
Listowel DSS	Listowel	154516.9816	Square feet	700478	29	Significant open renovations during heating season.

Avon Maitland District School Board
Energy Conservation and Demand Management Plan
July 2014 to July 2019

1 Education Sector Background

Funding and Energy Management Planning

All Boards receive 100% of their funding from the Ministry of Education.

The Ministry plans to announce each Board's funding allocation in March for the next Fiscal Year which runs from September 1st to August 31st. The Ministry does not provide Boards with multi-year funding allocations.

As a result, while a Board may have a five-year energy management strategy, the Board's ability to implement their strategy is dependent on the funding received in each of the five years covered by their energy management plan in balance with high priority asset renewal projects.

Asset Portfolios and Energy Management Planning

Energy consumption at a site can be impacted by a number of variables. The following lists provide education sector examples that may impact changes in consumption at a site from one year to the next. These examples will play a significant role in the Board's assessment of energy management priorities.

Facility Variables

Year of Construction

Building Area

- Major additions
- Sites sold
- Portables
  - installed
  - removed
- Site Use
  - Elementary school
  - Secondary school
  - Administrative building
  - Maintenance/warehouse facility

Shared Use Sites (e.g. one building, two boards share common areas and/or partnered with a municipality)

- Libraries
- Lighted sports fields

Equipment/Systems

- Age
- Type of technology
- Lifecycle
- % air conditioned building area

Other Variables

Programs

- Day care
- Before/After School Programs
- Summer School
- Community Use

Occupancy

- Significant Increase or decrease in number of students
- New programs being added to a site

2 About the Board

The following statistics apply to the Board's Fiscal Year 2012-13

- Total Number of Sites: 43
- Total Number of Students: 1649

To date the Board's energy management strategy has included the following:

- AP 216 - Energy Conservation Guidelines outlines strategies to conserve energy in all facilities operated by AMDSB.
- Continuous improvement of building envelope and HVAC systems while undertaking renewal projects. (offset by increased installation of HVAC units)
- Improved utilization of buildings through school consolidations.
- Continuous improvement and focus on preventive maintenance that will increase efficiency and longevity of equipment.
- The Board has a part time energy management position.

3 Energy Consumption Data for the Board

The values below are "metered" data for the Board.

Utility	Fiscal Year 2011-12 (Baseline)	Fiscal Year 2012-13
Total Electricity (kWh)	*15,277,578*	*15,910,813*
Total Natural Gas (m3)	*2,644,377*	*3,090,356*
Total Propane (litres - L)	*260,204*	*296,869*

The values below are raw data.

	Fiscal Year 2011-12 (Baseline)	Fiscal Year 2012-13
Total Energy Consumed (ekWh)	*45,210,845*	*50,841,616*
Energy Intensity (ekWh/m^2)	*206*	*232*

4 Energy Conservation Goal

The Board has set out the following energy conservation goals for the next five fiscal years

Fiscal Year	2013-14 (ekWh/ m2)	2014-15 (ekWh/ m2)	2015-16 (ekWh/ m2)	2016-17 (ekWh/ m2)	2017-18 (ekWh/ m2)
Conservation Goal	17.73	10.28	10.28	10.28	10.28

	FY 2013-14 to 2017-18 (% Reduction)	FY 2013-14 to 2017-18 (ekWh/m2)
Cumulative Conservation Goal	*16.42*	*190.93*

See CDM Appendix A for a cumulative rollup of the conservation activities that aim to achieve the stated goal above.

5 Energy Management Strategies

Energy management strategies fall into three key categories:

- Design/construction/retrofit
- Operations and maintenance
- Occupant Behaviour

5.2 Design/Construction/Retrofit

Definition

Design/construction/retrofit encompasses the original and ongoing intent of how a building and its systems are to perform as a whole through the integration of disciplines such as, architecture and engineering. **For the Board's projected projects over the next five years, please refer to Appendix B.**

General Activities

When renewal or new construction activities are undertaken, improvements to building performance are always considered. For example;

- When re-roofing an increased amount of insulation may be specified not only to improve drainage but to decrease heat loss and heat gain.
- High efficiency condensing boilers are considered, where/when, appropriate in preference to other primary heating technologies.
- Windows and treatments that increase light harvesting and reduce heat loss are given preference where appropriate and financially feasible.
- Occupancy controls for lighting and room heating are implemented during renewal activities.

5.3 Operations and Maintenance

Definition

Operations and maintenance includes the strategies the Board uses to ensure that the existing buildings and equipment perform at peak efficiency. **For the Board's projected projects over the next five years, please refer to Appendix C and D.**

General Activities

Continuous improvement of our maintenance program includes increased focus on preventive maintenance and training for building operators that will enable increased efficiency in our

buildings. Real time energy monitoring of electricity has been implemented in each facility over the 2013-14 fiscal period. This technology will aid the implementation of re-commissioning audits in the poorest performing buildings and will help monitor and sustain the level of the best performing buildings. The investment for some of these strategies are difficult to quantify and do not appear on the appendix. There is also some crossover occupant behaviour and strategies appear in that category.

5.4 Occupant Behaviour

Definition

Strategies used by the Board to educate occupants with an emphasis on changing specific behaviours that will reduce energy consumption. **For the Board's projected projects over the next five years, please refer to Appendix D.**

Activities

Real time energy monitoring of electricity will be available for all educators in our system. Through co-ordinated activities with Facilities and Curriculum, awareness and education concerning energy and demand management will help engage students and staff.

6 Other strategies Affecting Consumption and Demand

Environmental Programs

In 2013-14 schools within the Board that participated in environmental programs. In the past year 4 schools achieved Eco Schools status at the elementary level.

Energy Efficient Incentives

The Board applies for incentive programs to support the implementation of energy efficient projects on a regular basis and accesses the services of the MEdu Incentive Program Advisor.

Energy Procurement

The Board participates in the Catholic School Board Services Association (CSBSA) Electricity Consortia for the purchase of electricity commodities and Hamilton Wentworth Gas Consortia for the procurement of natural gas commodities.

Demand Management and Power Factor

The Board has monitored electrical demand on a less frequent basis in the past but more recently installed the capability to monitor demand more frequently. The primary exposure to demand charges occurs in the fall and he spring when cooling equipment only need run for a small

percentage of the billing period.. Co-ordination of chiller start-up and shutdown is critical to managing avoidable demand charges during these periods.
Some of the local distribution companies (LDC) state the power factor on each bill. Where possible the power factor is reviewed and followed up on if it falls outside of acceptable limits. A power factor over 0.9 results in no penalty charges with only moderate charges occurring at levels between 0.8 and 0.9.

Senior Management Approval of this Energy Conservation and Demand Management Plan

I confirm that (insert Board's name)'s senior management has reviewed and approved this Energy Conservation and Demand Management Plan.

Janet Baird-Jackson
Job Title

June 20, 2014
Date

CDM Appendix A - Cummulative Plan

	2013-14		2014-15		2015-16		2016-17		2017-18	
	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)
Appendix B; Design, Construction and Retrofit Strategies Total	$ 3,014,365	3,755,337	$ 1,850,000	2,211,493	$ 1,850,000	2,211,493	$ 1,850,000	2,211,493	$ 1,850,000	2,211,493
Appendix C; Operations and Maintenance Strategies Total	$ 40,000	110,945	$ 50,000	24,224	$ 50,000	24,224	$ 50,000	24,224	$ 50,000	24,224
Appendix D; Occupant Behaviour Strategies Total	$ 2,600	31	$ 8,800	18,653	$ 8,800	18,653	$ 8,800	18,653	$ 8,800	18,653
TOTAL	**$ 3,056,965**	**3,866,313**	**$ 1,908,800**	**2,254,371**	**$ 1,908,800**	**2,254,371**	**$ 1,908,800**	**2,254,371**	**$ 1,908,800**	**2,254,371**
Percentage reduction		**8**		**4**		**4**		**4**		**4**
Conservation Goal (ekWh/m²)		**17.63**		**10.28**		**10.28**		**10.28**		**10.28**
Conservation Goal (ekWh/ft²)		**1.637703185**		**0.95491239**		**0.95491239**		**0.95491239**		**0.95491239**

CDM Appendix B - Design, Construction and Retrofit Strategies

Lighting	Quantity of Time that Measure will be in place (years)	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)
High Efficiency Lighting Systems (T-8, T-5, CFL, LED ...)	15	$ 400,000	395,062	$ 400,000	395,062	$ 400,000	395,062	$ 400,000	395,062	$ 400,000	395,062	5,925,926
Daylight Sensors	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Outdoor Lighting	15	$ 33,780	33,363	$ -	-	$ -	-	$ -	-	$ -	-	166,815
Occupancy Sensors	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Daylight Harvesting	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Other (Describe)		$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-

HVAC	Quantity of Time that Measure will be in place	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)
Efficient Boilers (near condensing)	30	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
High Efficiency Boilers (condensing)	15	$ 923,720	2,399,039	$ 400,000	1,038,860	$ 400,000	1,038,860	$ 400,000	1,038,860	$ 400,000	1,038,860	22,383,794
High-efficiency boiler burners	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Geothermal	15	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Heat recovery/enthalpy wheels	30	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Economizers	15	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Energy efficient HVAC systems	30	$ -	-	$ -	-		-	$ -	-	$ -	-	-
Energy efficient Rooftop units	15	$ 200,000	79,165	$ 200,000	79,165	$ 200,000	79,165	$ 200,000	79,165	$ 200,000	79,165	1,187,472
High Efficiency Domestic Hot Water	15	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Efficient Chillers and Controls	25	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
High-efficiency motors	20	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
VFD	15	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Demand Ventilation	10	$ 292,600	694,909	$ 250,000	593,736	$ 250,000	593,736	$ 250,000	593,736	$ 250,000	593,736	9,411,904
Entrance Heater Controls	20	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Other (Describe)		$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-

Controls	Quantity of Time that Measure will be in place	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)
Building Automation Systems - New	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Building Automation Systems - Upgrade	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Other (Describe)		$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-

Building Envelope	Quantity of Time that Measure will be in place	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)
Glazing	30	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Increased Wall Insulation	50	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
New Roof	25	$ 838,415	78,007	$ 250,000	23,260	$ 250,000	23,260	$ 250,000	23,260	$ 250,000	23,260	622,634
New Windows	30	$ 325,850	75,793	$ 350,000	81,410	$ 350,000	81,410	$ 350,000	81,410	$ 350,000	81,410	1,193,071
Treatments	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Shading Devices	30	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Other (Describe)		$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-

Design, Construction and Retrofit Strategies Total	$ 3,014,365	3,755,337	$ 1,850,000	2,211,493	$ 1,850,000	2,211,493	$ 1,850,000	2,211,493	$ 1,850,000	2,211,493	40,891,616

CDM Appendix C - Operations and Maintenance Strategies

Policy and Planning		Quantity of Time that Measure will be in place (years)	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
			Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)
New school design/construction guidelines and specifications		5	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Day and Night Temperature Guidelines for all Schools		10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Night time blackout of sites	Interior	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
	Exterior	10	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Procures only Energy Star certified appliances		5	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Daylight Harvesting (servicing)		3	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Demand Ventilation (servicing)		3	$ 10,000	23,749	$ 10,000	23,749	$ 10,000	23,749	$ 10,000	23,749	$ 10,000	23,749	356,242
Other (Describe)			$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-

Energy Audits	Quantity of Time that Measure will be in place	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)
Walk Through Audit	5	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Engineering Audit	5	$ -	-	$ 40,000	475	$ 40,000	475	$ 40,000	475	$ 40,000	475	4,750
Other (Describe)			-		-		-		-		-	-

Real Time Monitoring	Quantity of Time that Measure will be in place	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)
Real-time energy data for operators to identify and diagnose building issues	5	$ 30,000	87,195	$ -	-		-		-	$ -	-	435,977
Other (Describe)		$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-

Operations and Maintenance Strategies Total	**$ 40,000**	**110,945**	**$ 50,000**	**24,224**	**$ 50,000**	**24,224**	**$ 50,000**	**24,224**	**$ 50,000**	**24,224**	**796,968**

CDM Appendix D - Occupant Behaviour Strategies

Training and Education	Quantity of Time that Measure will be in place (years)	2013-14		2014-15		2015-16		2016-17		2017-18		2013/14-2017/18
		Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)
Building Operator Training	3	$ -	-	$ 5,000	17,661	$ 5,000	17,661	$ 5,000	17,661	$ 5,000	17,661	176,610
NRCan Benchmarking Program	5	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Building Automation Training (site specific)	3	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Ongoing training and awareness programs for energy conservation	5	$ -	-	$ 1,200	961	$ 1,200	961	$ 1,200	961	$ 1,200	961	9,612
Provide detailed information on Building Operational costs	1	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Provide detailed information on energy consumption (e.g. via the Utility Consumption Database or other database)	1	$ 2,600	31	$ 2,600	31	$ 2,600	31	$ 2,600	31	$ 2,600	31	463
Participate in environmental programs, such as EcoSchools, Earthcare	1	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Other tools (Define)		$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	-
Occupant Behaviour Strategies Total		**$ 2,600**	**31**	**$ 8,800**	**18,653**	**$ 8,800**	**18,653**	**$ 8,800**	**18,653**	**$ 8,800**	**18,653**	**186,685**