

AVON MAITLAND DISTRICT SCHOOL BOARD

Create Positive, Inclusive Learning Environments, and Maximize Outcomes for Students

DIRECTOR'S INFORMATION REPORT

TO: Regular Board Meeting – Tuesday, June 27, 2017

AGENDA ITEM: 5.3 a)

SUBJECT: Green Energy Act 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 facilities by July 1st each year starting in 2013.
 - 1.1.2 Develop and implement 5-year Energy Conservation and Demand Management Plan (CDM) by July 1, 2014. (Completed and reported to the board June 24, 2014.)
 - 1.1.3 Broader Public Sector organizations are required to renew their Energy Conservation and Demand Management in 2019.
 - 1.1.4 Starting last year, the Ministry of Energy made public those Broader Public Sector organizations that did not report as per the regulations.
- 1.2 The regulation also requires that the content of the submission, uploaded to the Ministry of Energy, be made public and easily available on the Board web site as well as internally.
- 1.3 The report calculates energy use per square foot and is reported in equivalent kilowatt-hours per square foot (ekWh/ft²) which is a standard measure when comparing total energy intensity of a building including both heating source energy and all electrical consumption. Green House Gas (GHG) emissions are also reported.
- 1.4 The data used to populate this report is dependent on Local Distribution Companies (LDCs) reporting meter data accurately and having all adjustments to 'actual' made 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 slightly lower or higher than actual due to estimated reads. Propane is another heating fuel used at 5 sites. Propane is delivered in bulk and is 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 represents the report, organized alphabetically by school, to be uploaded to the Ministry of Energy web site. This appendix includes the consumption by energy source used to calculate GHG emissions and energy intensity based on Ministry of Energy assumptions regarding the ratio of GHG's and ekWh per unit of energy consumed. That is, the Ministry of Energy assumes that each energy type produces a certain amount of GHG's per ekWh consumed.
- 2.2 Appendix B1 through B3 represent the GHG and energy intensity data submitted for the current reporting period as well as the previous four periods. The data in B1 is organized alphabetically by site to facilitate a year over year comparison. Appendix B2 is organized from the lowest to the highest energy intensity by reporting period and Appendix B3 is organized from lowest to highest GHG emissions by reporting period.
- 2.3 Reviewing Appendix B1, every site indicates intensity trending down in 2015/2016 compared to prior year 2014/2015. While building renewal carried out each year may contribute to the energy efficiency of all facilities, weather is the main reason for this downward trend. Heating Degree Days were down 27% in 2015/2016 compared to the prior year 2014/2015. Building renewal work when it adds HVAC systems for occupant comfort can increase energy intensity.
- 2.4 Appendix B2 indicates that Shakespeare, Hamlet, Anne Hathaway, North Woods, and Brookside are the lowest energy intense buildings for 2015-16. As speculated in previous reports, Hamlet, Shakespeare, and Anne Hathaway are multiple story buildings which tend to be more efficient to heat due to the ratio of roof area to floor area. Brookside PS has received a number of significant renewal projects prior to 2015/2016 including roof-top units, Air handlers and school wide lighting upgrades. The 2015/2016 period was the first full year that Brookside had practically 100% LED lighting which will be the most significant contributor to its positive energy intensity result.
- 2.5 Sites with the highest energy intensity include Listowel DSS, Listowel Eastdale PS, Stephen Central PS, Milverton PS, and Mornington PS. Maitland River ES also has a relatively high energy intensity. LDSS and Maitland River have been among the highest energy intense buildings in previous reports. Both LDSS and Maitand River are part of an Energy Audit Pilot that started this past spring intended to identify key areas where improvements can be made to operations and equipment at these sites. Further energy audits will be scheduled based on energy intensity at other sites following after the pilots are complete.
- 2.6 The energy intensity at Clinton PS and SERC are also quite high. Each of these sites include Childcare programs which operates longer hours with activities that are also more energy intensive.
- 2.7 The data in Appendix A and B is not corrected for heating degree days (HDD) or cooling degree days (CDD). To understand the effect of heating degree days (HDD), it is helpful to look at both total electricity and natural gas consumption during each reporting period, comparing it to the total building floor area and district heating degree days. Table 1 captures this information.

Line	Measure	2011-12 Period Reported in 2013	2012-13 Period Reported in 2014	2013-14 Period Reported in 2015	2014-15 Period Reported in 2016	2015-16 Period Reported in 2017
1	Electricity (kWh)	15,277,577.00	15,910,812.77	14,898,549.68	14,986,999.05	15,114,566.69
2	% Change Electricity	n/a	4.14%	-2.48%	-1.90%	-1.07%
3	Natural Gas (m ³)	2,644,377.45	3,090,355.53	3,255,504.02	3,169,324.75	2,585,330.19
4	Natural Gas (ekWh)	26,443,774.45	30,903,555.30	32,555,040.20	31,693,247.45	25,853,301.95
5		10,127.83	9,508.79	8,469.05	8,379.36	8,678.52
6	NG Corrected for HDD	31,821,654.28	29,876,606.39	26,609,764.91	26,327,944.24	27,267,900.21
7	% Change Nat. Gas	n/a	-6.11%	-16.38%	-17.26%	-14.31%
8	Propane (Litres)	260,203.90	296,868.80	342,449.15	325,391.99	274,044.40
9	Propane (ekWh)	1,951,529.25	2,226,516.00	2,568,368.63	2,440,439.94	2,055,333.00
10		747.43	685.08	668.15	645.23	689.94
11	Propane Corrected for HDD	2,348,412.45	2,152,527.16	2,099,327.32	2,027,301.46	2,167,793.32
12	% Change Nat. Gas	n/a	-8.34%	-10.61%	-13.67%	-7.69%
13	Total Floor Area (ft ²)	2,356,010.42	2,360,814.07	2,310,958.90	2,326,304.96	2,347,794.29
14	% Change Floor Area	n/a	0.20%	-1.91%	-1.26%	-0.35%
15	Heating Degree Days	2,611	3,250	3,844	3,782	2,979
16	% Change HDD	n/a	24.47%	47.22%	44.86%	14.09%
17	Ave Energy Intensity (GEA Report)	19.26	21.50	22.46	21.61	18.01
18	% Change in Intensity	n/a	11.63%	16.61%	12.18%	-6.50%
19	Ave Energy Intensity (Corrected)	20.99	20.31	18.87	18.63	18.98
20	% Change in Intensity	n/a	-3.25%	-10.09%	-11.23%	-9.59%

Table 1 - Utility Consumption & HDD

2.8 The HDD trends significantly up over the three-year period from 2011 to 2013, then down slightly in 2014 and significantly down in 2015/2016. Gas consumption is directly related to HDD and the consumption trends reflect this in Table 1.

2.9 Electricity consumption does not correlate to HDD days as only a portion of its consumption is related to heating with the exception of the two electrically heated schools, North Woods and Central Perth. Electricity consumption for the 2015-16 reporting period trends up only slightly from the prior year.

2.10 Lowest energy intensity does not necessarily translate to lowest emissions. As noted in 2.1, the Ministry of Energy assumes that each energy type produces a certain volume of GHG's per ekWh consumed. Generally, electrically heated buildings have lower GHG emissions than Natural Gas heated facilities because electrical power produces the fewest GHG's. This accounts for North Woods and Central Perth being in the lowest 3 GHG emitting sites because they are electrically heated. Shakespeare PS overall has an energy efficient building envelope with small unvented windows, two story configuration, and partially below grade main floor.

3.0 Energy Consumption and Demand Management Plan (CDM)

3.1 Board staff participated in a working group through OASBO's Operations Maintenance Construction (OMC) Subcommittee on Energy to develop a template for an Energy and Demand Management Plan to meet the requirements of the Green Energy Act Phase 2 reporting. Avon Maitland's plan was presented to the board in June of 2014.

3.2 The plan set out the reduction targets for five years, with 2012/2013 being the base year and Year 1 of the plan being 2013/2014.

- 3.3 The primary focus of the strategies in 2013/2014 related to construction and retrofit activities that had energy related benefits. Avon Maitland set an aggressive target of an 8% reduction in energy intensity based on these activities.
- 3.4 The result in Table 1 indicates an average corrected energy intensity 18.98 ekWh/ft² (line 19) which is a slight increase from previous years.
- 3.5 In Table 1, natural gas consumption has been converted to ekWh and corrected for heating degree days (Line 6) based on 16 degC and average HDD days for the area. A similar correction is also performed for propane in line 11. This is a somewhat simplified way of making the correction but is appropriate for the purpose of this comparison. While actual natural gas and propane consumption is down from previous years the corrected values are higher.
- 3.6 The corrected energy intensity value (Line 19) indicates an increase in energy intensity of 1.64%. Energy intensity is affected by activities such as increased community use, added building conditioning, and increased air exchanges.
- 3.7 The reduction target for the last year of the CDM plan is 4%. As in past years, activities including occupant behavior, custodial training, and other construction and retrofit activities will be the focus. Practical energy audits should help focus energy reduction activities where they will have the largest impact.

Janet Baird-Jackson
Superintendent of Corporate Services

Lisa Walsh
Director of Education and
Secretary of the Board

Press TAB to move to input areas. **Energy Consumption and Greenhouse Gas Emissions Reporting - for 2014**

Confirm consecutive 12-mth period (mth-yr to mth-yr)	Sept/2014 - Aug/2015	
Sector	School Board	
Agency Sub-sector	School Board	
Organization Name	Avon Maitland District School Board Please fill in the mandatory fields indicated in red, in addition to submitting data on your energy usage.	

Operation Name	Operation Type	Address	City	Postal Code	Total Floor Area	Unit	Avg hrs/wk	Swimming Pool (Yes/No)	Number of Portables	Energy Type and Amount Purchased and Consumed in Natural Units						Total (calculated in webform)	
										Electricity		Natural Gas		Propane		GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)
										Quantity	Unit	Quantity	Unit	Quantity	Unit		
Anne Hathaway Public School	School	77 Bruce St	Stratford	N5A 4A2	51,946.63	Square feet	60	No	0	470,333.26172	kWh	20,195.96548	Cubic Meter			57,254.11072	13.18606
Avon PS	School	31 Huntingdon Ave	Stratford	N5A 6N7	30,903.19	Square feet	60	No	0	245,386.66724	kWh	28,278.31549	Cubic Meter			63,413.68537	17.66557
Bedford PS	School	59 Bedford Dr	Stratford	N5A 5J7	38,437.93	Square feet	60	No	0	240,051.00000	kWh	39,640.11661	Cubic Meter			84,678.26270	17.20533
Bluewater Coast ES	School	85 York Street	Hensall	N0M 1X0	24,164.97	Square feet	60	No	0	95,268.88062	kWh	29,618.99010	Cubic Meter			59,861.42497	16.96890
Brookside PS	School	36937 Belgrave Rd	Lucknow	N0G 2H0	28,341.38	Square feet	60	No	0	99,708.33985	kWh			43,658.90000	Litre	71,320.64012	14.34844
Central Huron SS & Clinton Admir	School	165 Princess St E	Clinton	N0M 1L0	157,820.50	Square feet	80	No	0	949,281.50574	kWh	205,630.85542	Cubic Meter			427,262.71379	19.86231
Central Perth E S	School	4663 Road 135 (Ellic- Sebringville)	N0K 1X0		29,999.02	Square feet	60	No	0	522,803.33234	kWh					21,198.62952	17.42735
Clinton PS	School	27 Percival St	Clinton	N0M 1L0	42,872.66	Square feet	60	No	0	341,698.56836	kWh	53,413.70761	Cubic Meter			114,840.59133	21.21090
Downie Central PS	School	4384 Line 20 (Down- St. Pauls	N0K 1V0		22,439.51	Square feet	60	No	2	162,318.46997	kWh	27,353.16769	Cubic Meter			58,296.32670	20.18858
Elma Township	School	5972 Line 72 (Elma-Atwood	N0G 1B0		37,366.91	Square feet	60	No	0	245,306.50092	kWh	39,521.22721	Cubic Meter			84,666.58723	17.80531
Exeter PS	School	93 Victoria St	Exeter	N0M 1S1	39,826.47	Square feet	60	No	0	234,306.07935	kWh	41,021.69549	Cubic Meter			87,057.36799	16.82990
F E Madill SS & ES	School	231 Madill Drive	Wingham	N0G 2W0	189,186.50	Square feet	80	No	0	1,042,200.00000	kWh	251,126.46247	Cubic Meter			517,045.59595	19.61618
Goderich District Cl & Goderich Di	School	260 South St.	Goderich	N7A 3M5	115,948.80	Square feet	80	No	0	705,116.80000	kWh	119,054.60000	Cubic Meter			253,678.91724	16.99373
Goderich Public School	School	125 Blake St W	Goderich	N7A 1Z1	48,706.69	Square feet	60	No	0	301,416.76849	kWh	68,275.31090	Cubic Meter			141,304.93335	21.08605
Hamlet PS	School	315 West Gore St	Stratford	N5A 7N4	30,924.24	Square feet	60	No	0	137,929.79265	kWh	19,888.61427	Cubic Meter			43,194.72836	11.29540
Howick Central S	School	45010 Harriston Rd (Gorrie	N0G 1X0		32,894.51	Square feet	60	No	0	171,400.76105	kWh			55,622.90000	Litre	92,663.95699	17.09892
Hullett Central PS	School	269 King St.	Londesborough	N0M 2H0	24,656.88	Square feet	60	No	1	142,459.99866	kWh	33,378.81359	Cubic Meter			68,883.35422	20.16486
Huron Centennial S	School	RR 1 39978 Centenn Brucefield	N0M 1J0		36,886.56	Square feet	60	No	0	217,302.46155	kWh	46,396.37949	Cubic Meter			96,529.42798	19.25885
Listowel Central PS - SOLD SEPT	School	305 Binning St	Listowel	N4W 1G4	36,220.56	Square feet	60	No	0	245,711.00040	kWh	37,095.06516	Cubic Meter			80,096.02140	17.66812
Listowel DSS	School	155 Maitland Ave S	Listowel	N4W 2M4	157,758.20	Square feet	80	No	3	923,717.85215	kWh	241,134.06852	Cubic Meter			493,349.49204	22.09988
Listowel Eastdale PS	School	365 Nichol Ave S	Listowel	N4W 2M3	25,564.29	Square feet	60	No	0	173,433.06982	kWh	37,876.09004	Cubic Meter			78,641.92259	22.53032
Little Falls PS	School	25 Lindsay Atkinson l St. Marys	N4X 1B6		42,202.06	Square feet	60	No	2	351,530.64990	kWh	43,736.35485	Cubic Meter			96,942.99814	19.34387
Maitland River ES	School	250 John St. East	Wingham	N0G 2W0	46,338.63	Square feet	40	No	0	378,360.00000	kWh	59,824.64940	Cubic Meter			128,447.83871	21.88591
Milverton PS	School	68 Mill Street E., Box Milverton	N0K 1M0		34,164.65	Square feet	60	No	0	201,091.06812	kWh			83,054.00000	Litre	136,138.72577	22.97716
Mitchell DHS	School	95 Frances St	Mitchell	N0K 1N0	88,271.59	Square feet	80	No	2	482,394.12036	kWh	122,812.73047	Cubic Meter			251,753.18097	20.25137
Mornington Central PS	School	7241 Road 131 (Morr Newton	N0K 1R0		16,713.00	Square feet	60	No	2	103,927.09387	kWh			50,702.80000	Litre	82,346.23936	27.54717
North Easthope PS	School	4672 Road 108 (NEI Stratford	N5A 6S2		23,282.34	Square feet	60	No	0	170,987.37876	kWh	41,005.80000	Litre			70,122.47794	19.72658
North Woods ES	School	84295 Ethel Line	Ethel	N0G 1T0	21,883.03	Square feet	60	No	0	308,774.27417	kWh					12,520.17927	14.11022
Romeo PS	School	49 Rebecca St	Stratford	N5A 3P2	20,731.29	Square feet	60	No	0	163,625.10278	kWh	20,788.56011	Cubic Meter			45,938.08371	18.54980
Seaforth PS & Administration & M	School	58 Chalk St N	Seaforth	N0K 1W0	76,499.10	Square feet	80	No	0	604,285.41016	kWh	85,553.31155	Cubic Meter			186,251.96558	19.78490
SERC Library & Day Care	School	220 Oakdale Ave	Stratford	N5A 1A3	19,192.71	Square feet	80	No	0	230,495.06746	kWh	16,929.26322	Cubic Meter			41,353.03614	21.38393
Shakespeare PS	School	35 Mowat St	Stratford	N5A 2B8	25,155.26	Square feet	60	No	0	212,886.23499	kWh	6,222.14212	Cubic Meter			20,395.86094	11.09167
South Huron DHS & DES	School	92 Gidley St E	Exeter	N0M 1S6	127,864.50	Square feet	80	No	0	674,767.18190	kWh	172,525.60893	Cubic Meter			353,542.03413	19.61710
South Perth Centennial PS	School	1866 Road 163 (Blan St. Marys	N4X 1C4		25,951.79	Square feet	60	No	0	118,173.56152	kWh	31,179.90784	Cubic Meter			63,741.27720	17.32238
Sprucedale PS	School	59 Fraser Street	Shakespeare	N0B 2P0	20,426.67	Square feet	60	No	2	106,206.18750	kWh	23,671.90710	Cubic Meter			49,061.19519	17.51563
St Marys DC & VI & Elementary	School	338 Elizabeth St. Box St. Marys	N4X 1B6		101,751.20	Square feet	80	No	0	596,679.91243	kWh	139,996.25150	Cubic Meter			288,874.87006	20.48653
Stephen Central PS	School	70042 Goshen Line (Crediton	N0M 1M0		22,410.46	Square feet	60	No	0	119,039.99918	kWh	36,405.62819	Cubic Meter			73,656.29750	22.57655
Stratford Central	School	60 St. Andrew St.	Stratford	N5A 1A3	136,856.05	Square feet	80	No	1	759,386.00000	kWh	127,856.73114	Cubic Meter			272,520.97156	15.47771
Stratford Northwestern	School	428 Forman Ave.	Stratford	N5A 6R7	201,353.98	Square feet	80	No	4	1,101,076.00000	kWh	248,266.74851	Cubic Meter			514,026.24758	18.57227
Upper Thames E S	School	165 Frances St. RR# Mitchell	N0K 1N0		67,873.98	Square feet	80	No	2	642,637.00378	kWh	72,117.28917	Cubic Meter			162,404.53931	20.76029
Wallace PS - SOLD JUL 2016	School	8727 Road 164 (Wal Gowanstov	N0G 1Y0		26,005.60	Square feet	60	No	0	121,093.33337	kWh	38,543.66524	Cubic Meter			77,781.78667	20.40817

Appendix B1 - Alphabetical by Site

Site	2011-12 Period Reported in 2013		2012-13 Period Reported in 2014			2013-14 Period Reported in 2015			2014-15 Period Reported in 2016			2015-16 Period Reported in 2017		
	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Energy Intensity Trend from Previous Year	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Energy Intensity Trend from Previous Year	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Energy Intensity Trend from Previous Year	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Energy Intensity Trend from Previous Year
Anne Hathaway Public School	107,215.37	16.71	117,489.99	17.64	↑	90,456.95	15.48	↓	73,868.61	15.25	↓	57,254.11	13.19	↓
Avon PS	68,787.63	15.90	83,630.52	18.72	↑	105,515.74	24.25	↑	76,818.94	20.71	↓	63,413.69	17.67	↓
Bedford PS	70,608.50	14.23	79,067.31	15.58	↑	86,120.42	17.65	↑	93,241.88	18.18	↑	84,678.26	17.21	↓
Bluewater Coast ES	62,085.12	16.33	69,238.56	17.96	↑	76,635.06	20.10	↑	70,309.02	19.43	↓	59,861.42	16.97	↓
Brookside PS	111,628.50	20.55	113,073.26	20.59	↑	131,090.98	23.90	↑	116,707.13	22.24	↓	71,320.64	14.35	↓
Central Huron SS & Clinton Administration	538,787.80	22.06	575,008.05	23.23	↑	585,956.97	24.13	↑	549,778.96	23.94	↓	427,262.71	19.86	↓
Central Perth E S	46,697.28	15.88	56,824.92	19.72	↑	45,581.28	19.99	↑	23,812.08	19.84	↓	21,198.63	17.43	↓
Clinton PS	103,013.77	18.30	152,241.97	23.23	↑	148,653.21	23.33	↑	149,113.07	25.31	↑	114,840.59	21.21	↓
Downie Central PS	76,572.66	23.08	81,336.27	24.70	↑	87,737.38	27.31	↑	69,084.78	23.96	↓	58,296.33	20.19	↓
Elma Township	73,914.10	13.99	91,794.52	17.16	↑	106,589.99	19.81	↑	100,019.99	20.25	↑	84,666.59	17.81	↓
Exeter PS	102,852.05	16.96	118,679.77	19.21	↑	118,735.89	19.68	↑	105,573.20	19.14	↓	87,057.37	16.83	↓
F E Madill SS & ES	576,030.77	19.44	623,617.80	21.29	↑	661,077.51	22.53	↑	595,829.21	21.35	↓	517,045.60	19.62	↓
Goderich District CI & Goderich District CI Elementary	328,708.52	18.49	368,624.59	22.07	↑	382,545.01	22.08	↑	295,702.28	19.02	↓	253,678.92	16.99	↓
Goderich Public School	136,786.91	19.59	151,068.16	21.37	↑	177,045.28	25.47	↑	166,796.36	23.64	↓	141,304.99	21.09	↓
Hamlet PS	42,395.26	10.04	52,771.90	12.85	↑	58,035.00	13.36	↑	50,262.40	12.68	↓	43,194.73	11.30	↓
Howick Central S	110,234.19	18.21	124,196.19	22.11	↑	137,095.85	22.40	↑	118,808.53	20.84	↓	92,663.96	17.10	↓
Hullett Central PS	62,310.10	18.18	75,611.18	21.75	↑	86,948.40	24.19	↓	81,342.07	23.74	↓	68,883.35	20.16	↓
Huron Centennial S	127,734.51	21.96	134,058.40	23.68	↑	123,480.19	21.74	↓	118,262.08	22.32	↑	96,529.43	19.26	↓
Listowel Central PS - SOLD SEPT 2016	92,447.61	17.69	100,822.32	18.23	↑	109,835.69	21.06	↑	91,070.68	20.38	↓	80,096.02	17.67	↓
Listowel DSS	485,080.40	20.09	700,478.32	28.62	↓	637,410.60	27.40	↓	585,468.69	25.76	↓	493,349.49	22.10	↓
Listowel Eastdale PS	83,851.03	23.36	77,678.34	21.35	↓	78,935.25	20.65	↓	94,109.95	25.94	↑	78,641.92	22.53	↓
Little Falls PS	103,712.64	17.96	117,295.22	19.69	↑	146,932.07	24.94	↑	115,388.96	22.49	↓	96,943.00	19.34	↓
Maitland River ES	n/a	n/a	n/a	n/a	n/a	145,337.86	22.79	↑	156,151.92	25.13	↑	128,447.84	21.89	↓
Milverton PS	136,762.28	21.99	161,692.08	25.33	↑	157,862.58	25.04	↓	140,682.42	23.44	↓	136,138.73	22.98	↓
Mitchell DHS	310,781.22	22.21	312,351.25	21.66	↓	295,720.28	21.01	↓	286,371.80	22.53	↑	251,753.18	20.25	↓
Mornington Central PS	51,020.25	20.95	62,876.32	25.32	↑	75,630.83	30.41	↓	76,278.26	26.55	↓	82,346.24	27.55	↑
North Easthope PS	78,037.33	19.31	78,486.72	18.67	↓	88,296.58	23.29	↑	81,125.90	22.69	↓	70,122.48	19.73	↓
North Woods ES	30,684.97	14.30	39,417.54	18.76	↑	29,399.07	17.67	↓	13,974.13	15.96	↓	12,520.18	14.11	↓
Romeo PS	62,093.76	20.02	67,367.06	21.38	↑	65,397.24	21.54	↓	52,763.39	19.26	↓	45,938.08	18.55	↓
Seaforth PS & Administration & Maintenance	203,512.35	18.50	240,110.80	21.11	↑	239,099.18	21.75	↑	217,220.29	21.57	↓	186,251.97	19.78	↓
SERC Library & Day Care	62,134.03	23.96	63,309.06	24.08	↑	67,901.22	26.62	↑	49,222.80	23.46	↓	41,353.04	21.38	↓
Shakespeare PS	35,004.84	12.18	36,011.33	12.65	↑	35,676.34	13.97	↑	25,122.12	13.05	↓	20,395.86	11.09	↓
South Huron DHS & DES	410,072.09	20.25	471,084.09	23.42	↑	466,192.10	23.22	↓	460,560.64	24.04	↑	353,542.03	19.62	↓
South Perth Centennial PS	81,854.88	21.11	79,034.08	18.98	↓	96,568.54	23.51	↓	96,573.17	24.52	↑	63,741.28	17.32	↓
Sprucedale PS	56,040.24	18.02	63,320.83	20.43	↓	66,629.33	21.79	↑	63,686.30	21.42	↓	49,061.20	17.52	↓
St Marys DC & VI & Elementary	338,889.21	21.45	336,571.45	21.24	↓	350,654.13	22.67	↑	339,364.55	23.62	↑	288,874.87	20.49	↓
Stephen Central PS	72,521.79	20.36	79,167.74	22.17	↑	83,575.09	23.76	↑	83,339.58	24.85	↑	73,656.30	22.58	↓
Stratford Central	318,080.96	15.66	339,173.01	16.53	↑	395,771.82	19.45	↓	315,364.29	17.26	↓	272,520.97	15.48	↓
Stratford Northwestern	557,853.55	21.52	648,217.61	24.62	↑	667,192.56	23.48	↓	611,261.73	23.06	↓	514,026.25	18.57	↓
Upper Thames E S	191,616.75	20.40	223,966.84	24.00	↑	206,974.70	22.16	↓	192,346.64	23.35	↑	162,404.54	20.76	↓
Wallace PS - SOLD JUL 2016	71,512.80	17.73	89,653.04	22.53	↑	98,522.82	25.46	↑	90,300.81	23.66	↓	77,781.79	20.41	↓

Appendix B2 - Energy Intensity Ranking by Reporting Period

2011-12 Period Reported in 2013			2012-13 Period Reported in 2014			2013-14 Period Reported in 2015			2014-15 Period Reported in 2016			2015-16 Period Reported in 2017		
Site	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Site	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Site	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Site	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Site	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)
Hamlet PS	42,395.26	10.04	Shakespeare PS	36,011.33	12.65	Hamlet PS	58,035.00	13.38	Hamlet PS	50,262.40	12.68	Shakespeare PS	20,395.86	11.09
Shakespeare PS	35,004.84	12.18	Hamlet PS	52,771.90	12.93	Shakespeare PS	35,676.34	13.97	Shakespeare PS	25,122.12	13.05	Hamlet PS	43,194.73	11.30
Elma Township	73,914.10	13.99	Bedford PS	79,067.31	15.58	Anne Hathaway Public School	90,456.95	15.48	Anne Hathaway Public School	73,868.61	15.25	Anne Hathaway Public School	57,254.11	13.19
Bedford PS	70,608.50	14.23	Stratford Central	339,173.01	18.53	Bedford PS	86,120.42	17.63	North Woods ES	13,974.13	15.96	North Woods ES	12,520.18	14.11
North Woods ES	30,684.97	14.30	Elma Township	91,794.52	17.16	North Woods ES	29,399.07	17.67	Stratford Central	315,364.29	17.26	Brookside PS	71,320.64	14.35
Stratford Central	318,080.96	15.66	Anne Hathaway Public School	117,489.99	17.64	Stratford Central	395,771.82	19.45	Bedford PS	93,241.88	18.18	Stratford Central	272,520.97	15.48
Central Perth E S	46,697.28	15.88	Bluewater Coast ES	69,238.56	17.96	Exeter PS	118,735.89	19.68	Goderich District CI & Goderich District CI ES	295,702.28	19.02	Exeter PS	87,057.37	16.83
Avon PS	68,787.63	15.90	Listowel Central PS	100,822.32	18.23	Elma Township	106,589.99	19.81	Exeter PS	105,573.20	19.14	Bluewater Coast ES	59,861.42	16.97
Bluewater Coast ES	62,085.12	16.33	North Easthope PS	78,486.72	18.67	Central Perth E S	45,581.28	19.99	Romeo PS	52,763.39	19.26	Goderich District CI & Goderich District CI ES	253,678.92	16.99
Anne Hathaway Public School	107,215.37	16.71	Avon PS	83,630.52	18.72	Bluewater Coast ES	76,635.06	20.10	Bluewater Coast ES	70,309.02	19.43	Howick Central S	92,663.96	17.10
Exeter PS	102,852.05	16.96	North Woods ES	39,417.54	18.76	Listowel Eastdale PS	78,935.25	20.65	Central Perth E S	23,812.08	19.84	Bedford PS	84,678.26	17.21
Listowel Central PS	92,447.61	17.69	South Perth Centennial PS	79,034.08	18.98	Mitchell DHS	295,720.28	21.01	Elma Township	100,019.99	20.25	South Perth Centennial PS	63,741.28	17.32
Wallace PS	71,512.80	17.73	Exeter PS	118,679.77	19.21	Listowel Central PS	109,835.69	21.06	Listowel Central PS	91,070.68	20.38	Central Perth E S	21,198.63	17.43
Little Falls PS	103,712.64	17.96	Little Falls PS	117,295.22	19.69	Romeo PS	65,397.24	21.54	Avon PS	76,818.94	20.71	Sprucedale PS	49,081.20	17.52
Sprucedale PS	56,040.24	18.02	Central Perth E S	56,824.92	19.72	Huron Centennial S	123,480.19	21.74	Howick Central S	118,808.53	20.84	Avon PS	63,413.69	17.67
Hullett Central PS	62,310.10	18.18	Sprucedale PS	63,320.83	20.43	Seaforth PS & Administration & Maintenance	239,099.18	21.75	F E Madill SS & ES	595,823.21	21.35	Listowel Central PS - SOLD SEPT 2016	80,098.02	17.67
Howick Central S	110,234.19	18.21	Brookside PS	113,073.26	20.59	Sprucedale PS	66,629.33	21.78	Sprucedale PS	63,668.30	21.42	Elma Township	84,668.59	17.81
Clinton PS	103,013.77	18.30	Goderich District CI & Goderich District CI ES	368,624.59	20.77	Goderich District CI & Goderich District CI ES	382,545.01	22.08	Seaforth PS & Administration & Maintenance	217,220.29	21.57	Romeo PS	45,938.08	18.55
Goderich District CI & Goderich District CI ES	328,708.52	18.49	Seaforth PS & Administration & Maintenance	240,110.80	21.11	Upper Thames E S	206,974.70	22.14	Brookside PS	116,707.13	22.24	Stratford Northwestern	514,026.25	18.57
Seaforth PS & Administration & Maintenance	203,512.35	18.50	St Marys DC & VI & Elementary	336,571.45	21.24	Howick Central S	137,095.85	22.40	Huron Centennial S	118,262.08	22.32	Huron Centennial S	96,528.43	19.26
North Easthope PS	78,037.33	19.31	F E Madill SS & ES	623,617.80	21.29	F E Madill SS & ES	661,077.51	22.53	Little Falls PS	115,388.96	22.49	Little Falls PS	96,943.00	19.34
F E Madill SS & ES	576,030.77	19.44	Listowel Eastdale PS	77,678.34	21.35	St Marys DC & VI & Elementary	350,654.13	22.67	Mitchell DHS	286,371.80	22.53	F E Madill SS & ES	517,045.60	19.62
Goderich Public School	136,786.91	19.59	Goderich Public School	151,068.16	21.37	Maitland River ES	145,337.86	22.79	North Easthope PS	81,125.90	22.69	South Huron DHS & DES	353,542.03	19.62
Romeo PS	62,093.76	20.02	Romeo PS	67,367.06	21.38	South Huron DHS & DES	466,192.10	23.22	Stratford Northwestern	611,261.73	23.06	North Easthope PS	70,122.48	19.73
Listowel DSS	485,080.40	20.09	Mitchell DHS	312,351.25	21.66	North Easthope PS	88,296.58	23.25	Upper Thames E S	192,346.64	23.35	Seaforth PS & Administration & Maintenance	186,251.97	19.78
South Huron DHS & DES	410,072.09	20.25	Hullett Central PS	75,811.18	21.73	Clinton PS	149,853.21	23.33	Milverton PS	140,862.42	23.44	Central Huron SS & Clinton Administration	427,262.71	19.86
Stephen Central PS	72,521.79	20.36	Howick Central S	124,196.19	22.11	Stratford Northwestern	667,192.56	23.46	SERC Library & Day Care	49,222.80	23.46	Hullett Central PS	68,883.35	20.16
Upper Thames E S	191,616.75	20.40	Stephen Central PS	79,167.74	22.17	South Perth Centennial PS	96,568.54	23.51	St Marys DC & VI & Elementary	339,364.55	23.62	Downie Central PS	58,298.33	20.19
Brookside PS	111,628.50	20.55	Wallace PS	89,653.04	22.53	Stephen Central PS	83,575.09	23.76	Goderich Public School	166,798.36	23.64	Mitchell DHS	251,753.18	20.25
Mornington Central PS	51,020.25	20.95	Central Huron SS & Clinton Administration	575,008.05	23.23	Brookside PS	131,090.98	23.90	Wallace PS	90,300.81	23.66	Wallace PS - SOLD JUL 2016	77,781.79	20.41
South Perth Centennial PS	81,854.88	21.11	Clinton PS	152,241.97	23.23	Central Huron SS & Clinton Administration	585,956.97	24.13	Hullett Central PS	81,342.07	23.74	St Marys DC & VI & Elementary	288,874.87	20.49
St Marys DC & VI & Elementary	338,889.21	21.45	South Huron DHS & DES	471,084.09	23.42	Hullett Central PS	86,948.40	24.16	Central Huron SS & Clinton Administration	549,778.96	23.94	Upper Thames E S	162,404.54	20.76
Stratford Northwestern	557,853.55	21.52	Huron Centennial S	134,058.40	23.68	Avon PS	105,515.74	24.26	Downie Central PS	69,084.78	23.96	Goderich Public School	141,304.99	21.09
Huron Centennial S	127,734.51	21.96	Upper Thames E S	223,966.84	24.00	Little Falls PS	146,932.07	24.94	South Huron DHS & DES	460,560.64	24.04	Clinton PS	114,840.59	21.21
Milverton PS	136,762.28	21.99	SERC Library & Day Care	63,309.06	24.08	Milverton PS	157,862.58	25.04	South Perth Centennial PS	96,573.17	24.52	SERC Library & Day Care	41,353.04	21.38
Central Huron SS & Clinton Administration	538,787.80	22.06	Stratford Northwestern	648,217.61	24.62	Wallace PS	98,522.82	25.46	Stephen Central PS	83,339.58	24.85	Maitland River ES	128,447.84	21.89
Mitchell DHS	310,781.22	22.21	Downie Central PS	81,336.27	24.70	Goderich Public School	177,045.28	25.47	Maitland River ES	156,151.92	25.13	Listowel DSS	493,349.49	22.10
Downie Central PS	76,572.66	23.08	Mornington Central PS	62,876.32	25.32	SERC Library & Day Care	67,901.22	25.62	Clinton PS	149,113.07	25.31	Listowel Eastdale PS	78,641.92	22.53
Listowel Eastdale PS	83,851.03	23.36	Milverton PS	161,692.08	25.33	Downie Central PS	87,737.38	27.31	Listowel DSS	585,468.69	25.76	Stephen Central PS	73,656.30	22.58
SERC Library & Day Care	62,134.03	23.96	Listowel DSS	700,478.32	28.62	Listowel DSS	637,410.60	27.40	Listowel Eastdale PS	94,109.95	25.94	Milverton PS	136,138.73	22.98
Maitland River ES	n/a	n/a	Maitland River ES	n/a	n/a	Mornington Central PS	75,630.83	30.41	Mornington Central PS	76,278.26	26.55	Mornington Central PS	82,346.24	27.55

Appendix B3 - GHG Emissions Ranking by Reporting Period

2011-12 Period Reported in 2013			2012-13 Period Reported in 2014			2013-14 Period Reported in 2015			2014-15 Period Reported in 2016			2015-16 Period Reported in 2017		
Site	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Site	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Site	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Site	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)	Site	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)
North Woods ES	30,684.97	14.30	Shakespeare PS	36,011.33	12.65	North Woods ES	29,399.07	17.67	North Woods ES	13,974.13	15.96	North Woods ES	12,520.18	14.11
Shakespeare PS	35,004.84	12.18	North Woods ES	39,417.54	18.76	Shakespeare PS	35,676.34	13.97	Central Perth E S	23,812.08	19.84	Shakespeare PS	20,395.86	11.09
Hamlet PS	42,395.26	10.04	Hamlet PS	52,771.90	12.85	Central Perth E S	45,581.28	19.98	Shakespeare PS	25,122.12	13.05	Central Perth E S	21,198.63	17.43
Central Perth E S	46,697.28	15.88	Central Perth E S	56,824.92	19.72	Hamlet PS	58,035.00	13.36	SERC Library & Day Care	49,222.80	23.46	SERC Library & Day Care	41,353.04	21.38
Mornington Central PS	51,020.25	20.95	Mornington Central PS	62,676.32	25.32	Romeo PS	65,397.24	21.54	Hamlet PS	50,262.40	12.68	Hamlet PS	43,194.73	11.30
Sprucedale PS	56,040.24	18.02	SERC Library & Day Care	63,309.06	24.08	Sprucedale PS	66,629.33	21.79	Romeo PS	52,763.39	19.26	Romeo PS	45,938.08	18.55
Bluewater Coast ES	62,085.12	16.33	Sprucedale PS	63,320.83	20.43	SERC Library & Day Care	67,901.22	26.62	Sprucedale PS	63,686.30	21.42	Sprucedale PS	49,061.20	17.52
Romeo PS	62,093.76	20.02	Romeo PS	67,367.06	21.38	Mornington Central PS	75,630.83	30.41	Downie Central PS	69,084.78	23.96	Anne Hathaway Public School	57,254.11	13.19
SERC Library & Day Care	62,134.03	23.96	Bluewater Coast ES	69,238.56	17.96	Bluewater Coast ES	76,635.06	20.10	Bluewater Coast ES	70,309.02	19.43	Downie Central PS	58,296.33	20.19
Hullett Central PS	62,310.10	18.18	Hullett Central PS	75,811.18	21.75	Listowel Eastdale PS	78,935.25	20.65	Anne Hathaway Public School	73,868.61	15.25	Bluewater Coast ES	59,861.42	16.97
Avon PS	68,787.63	15.90	Listowel Eastdale PS	77,678.34	21.35	Stephen Central PS	83,575.09	23.76	Mornington Central PS	76,278.26	26.55	Avon PS	63,413.69	17.67
Bedford PS	70,608.50	14.23	North Easthope PS	78,486.72	18.67	Bedford PS	86,120.42	17.65	Avon PS	76,818.94	20.71	South Perth Centennial PS	63,741.28	17.32
Wallace PS	71,512.80	17.73	South Perth Centennial PS	79,034.08	18.98	Hullett Central PS	89,948.40	24.19	North Easthope PS	81,125.90	22.69	Hullett Central PS	68,883.35	20.16
Stephen Central PS	72,521.79	20.36	Bedford PS	79,067.31	15.53	Downie Central PS	87,737.38	27.31	Hullett Central PS	81,342.07	23.74	North Easthope PS	70,122.48	19.73
Elma Township	73,914.10	13.99	Stephen Central PS	79,167.74	22.17	North Easthope PS	88,296.58	23.29	Stephen Central PS	83,339.58	24.85	Brookside PS	71,320.64	14.35
Downie Central PS	76,572.66	23.08	Downie Central PS	81,336.27	24.70	Anne Hathaway Public School	90,456.95	15.48	Wallace PS	90,300.81	23.66	Stephen Central PS	73,656.30	22.58
North Easthope PS	78,037.33	19.31	Avon PS	83,300.52	18.72	South Perth Centennial PS	96,568.54	23.51	Listowel Central PS	91,070.68	20.38	Wallace PS - SOLD JUL 2016	77,781.79	20.41
South Perth Centennial PS	81,854.88	21.11	Wallace PS	89,653.04	22.53	Wallace PS	98,522.82	25.46	Bedford PS	93,241.88	18.18	Listowel Eastdale PS	78,641.92	22.53
Listowel Eastdale PS	83,851.03	23.36	Elma Township	91,794.52	17.16	Avon PS	105,515.74	24.25	Listowel Eastdale PS	94,109.95	25.94	Listowel Central PS - SOLD SEPT 2016	80,096.02	17.67
Listowel Central PS	92,447.61	17.69	Listowel Central PS	100,822.32	18.23	Elma Township	106,589.99	19.81	South Perth Centennial PS	96,573.20	24.52	Mornington Central PS	82,346.24	27.55
Exeter PS	102,852.05	16.96	Brookside PS	113,073.26	20.59	Listowel Central PS	109,835.69	21.06	Elma Township	100,019.99	20.25	Elma Township	84,666.59	17.81
Clinton PS	103,013.77	18.30	Little Falls PS	117,295.22	19.69	Exeter PS	118,735.89	19.68	Exeter PS	105,573.20	19.14	Bedford PS	84,678.26	17.21
Little Falls PS	103,712.64	17.96	Anne Hathaway Public School	117,489.99	17.64	Huron Centennial S	123,480.19	21.74	Little Falls PS	115,388.96	22.49	Exeter PS	87,057.37	16.83
Anne Hathaway Public School	107,215.37	16.71	Exeter PS	118,679.77	19.21	Brookside PS	131,090.98	23.90	Brookside PS	116,707.13	22.24	Howick Central S	92,663.96	17.10
Howick Central S	110,234.19	18.21	Howick Central S	124,196.19	22.11	Howick Central S	137,995.85	22.40	Huron Centennial S	118,262.08	22.32	Huron Centennial S	96,529.43	19.26
Brookside PS	111,628.50	20.53	Huron Centennial S	134,058.40	23.68	Maitland River ES	145,337.86	22.79	Howick Central S	118,808.53	23.84	Little Falls PS	96,943.00	19.34
Huron Centennial S	127,734.51	21.96	Goderich Public School	151,068.16	21.37	Little Falls PS	146,932.07	24.94	Milverton PS	140,682.42	23.44	Clinton PS	114,840.59	21.21
Milverton PS	136,782.28	21.99	Clinton PS	152,241.97	23.23	Clinton PS	148,853.21	23.33	Clinton PS	149,113.07	23.31	Maitland River ES	128,447.84	21.89
Goderich Public School	136,786.91	19.59	Milverton PS	161,692.08	25.33	Milverton PS	157,862.58	25.04	Maitland River ES	156,151.92	25.13	Milverton PS	136,138.73	22.98
Upper Thames E S	191,616.75	20.40	Upper Thames E S	223,966.84	24.00	Goderich Public School	177,045.28	25.47	Goderich Public School	166,796.38	23.64	Goderich Public School	141,304.99	21.09
Seaforth PS & Administration & Maintenance	203,512.35	18.50	Seaforth PS & Administration & Maintenance	240,110.80	21.11	Upper Thames E S	206,974.70	22.16	Upper Thames E S	192,346.64	23.35	Upper Thames E S	162,404.54	20.76
Mitchell DHS	310,781.22	22.21	Mitchell DHS	312,351.25	21.66	Seaforth PS & Administration & Maintenance	239,099.18	21.76	Seaforth PS & Administration & Maintenance	217,220.29	21.57	Seaforth PS & Administration & Maintenance	186,251.97	19.78
Stratford Central	318,080.96	15.66	St Marys DC & VI & Elementary	336,571.45	21.24	Mitchell DHS	295,720.28	21.01	Mitchell DHS	286,371.80	22.53	Mitchell DHS	251,753.18	20.25
Goderich District CI & Goderich District CI ES	328,708.52	18.49	Stratford Central	339,173.01	16.53	St Marys DC & VI & Elementary	350,854.13	22.67	Goderich District CI & Goderich District CI ES	295,702.28	19.02	Goderich District CI & Goderich District CI ES	253,678.92	16.99
St Marys DC & VI & Elementary	338,889.21	21.45	Goderich District CI & Goderich District CI ES	368,624.59	20.77	Goderich District CI & Goderich District CI ES	382,545.01	22.08	Stratford Central	315,364.29	17.26	Stratford Central	272,520.97	15.48
South Huron DHS & DES	410,072.09	20.25	South Huron DHS & DES	471,084.09	23.42	Stratford Central	395,771.82	19.45	St Marys DC & VI & Elementary	339,364.55	23.62	St Marys DC & VI & Elementary	288,874.87	20.49
Listowel DSS	485,080.40	20.09	Central Huron SS & Clinton Administration	575,008.05	23.23	South Huron DHS & DES	466,192.10	23.22	South Huron DHS & DES	460,560.64	24.04	South Huron DHS & DES	353,542.03	19.62
Central Huron SS & Clinton Administration	539,787.80	22.06	F E Madill SS & ES	623,517.80	21.29	Central Huron SS & Clinton Administration	585,956.97	24.12	Central Huron SS & Clinton Administration	549,778.96	23.94	Central Huron SS & Clinton Administration	427,262.71	19.86
Stratford Northwestern	557,853.55	21.52	Stratford Northwestern	648,217.61	24.62	Listowel DSS	637,410.80	27.40	Listowel DSS	595,468.69	25.76	Listowel DSS	493,348.49	22.10
F E Madill SS & ES	576,030.77	19.44	Listowel DSS	700,478.32	28.62	F E Madill SS & ES	661,077.51	22.53	F E Madill SS & ES	595,829.21	21.35	Stratford Northwestern	514,028.25	18.57
Maitland River ES	n/a	n/a	Maitland River ES	n/a	n/a	Stratford Northwestern	667,192.56	23.48	Stratford Northwestern	611,261.73	23.06	F E Madill SS & ES	517,045.60	19.62