Report to Committee of the Whole

June 7, 2023

Subject: Energy and Greenhouse Gas Emissions Update

Recommendation

This report is for the information of the board.

2021/22 Energy Use Intensity

Since 2008 the Waterloo Region District School Board (Board) has monitored energy consumption at our schools, outdoor centres and administration and supporting facilities, using weather-normalized Energy Use Intensity (EUI) to monitor performance year to year and identify facilities in greater need of attention. Figure 1 reports the change in total EUI for all Board-owned sites over the last 14 years. The Board has experienced a weather-normalized **16.1 percent reduction in our overall Energy Use Intensity** between 2008 and 2021/22. Electricity intensity was reduced by 19.8 percent, with a reduction in natural gas intensity of 14.5 percent. Figure 2 reports the average EUI by the panel. **The EUI in all three panels increased in 2021/22 due to the enhanced ventilation measures undertaken in response to COVID-19**, as mandated by the Ministry of Education for the 2021/22 school year. This increase was not offset by system shutdowns in 2021/22, as it was in 2020/21. These measures, including HEPA air filtration units and maximizing ventilation, increased energy consumption by up to 1 percent and 10 percent respectively. The EUI for each school is presented in Appendices A and B. The technical background for these terms and methodology is given in Appendix G.

Figure 1: Total Energy Use Intensity Combined, 2008 to Fiscal Year 2021/22

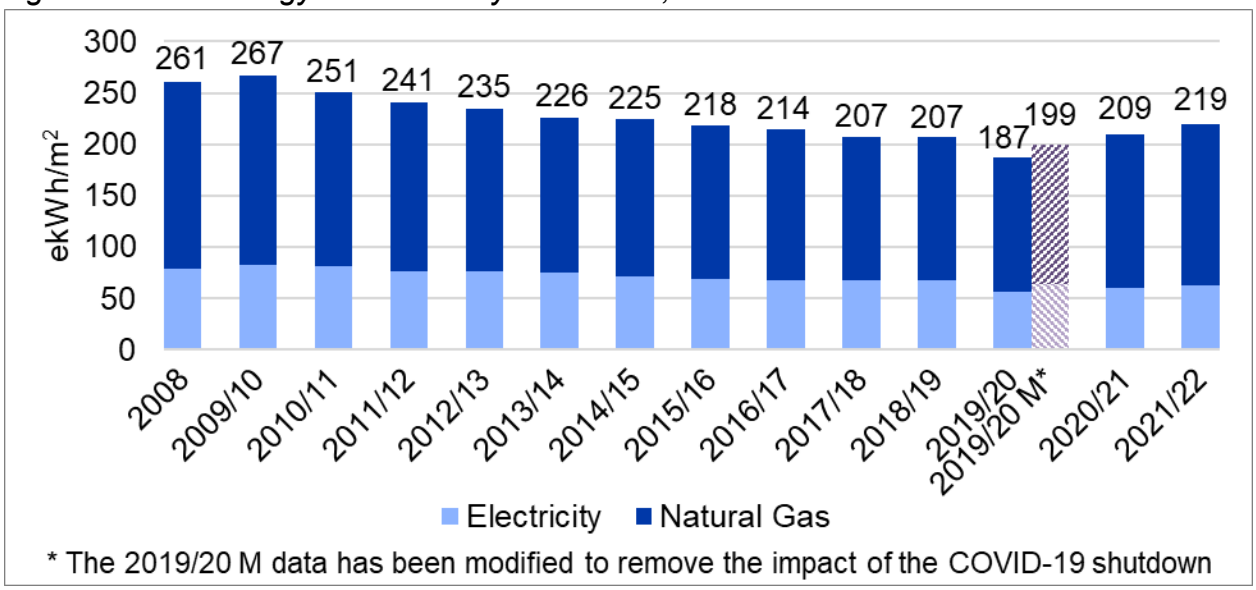
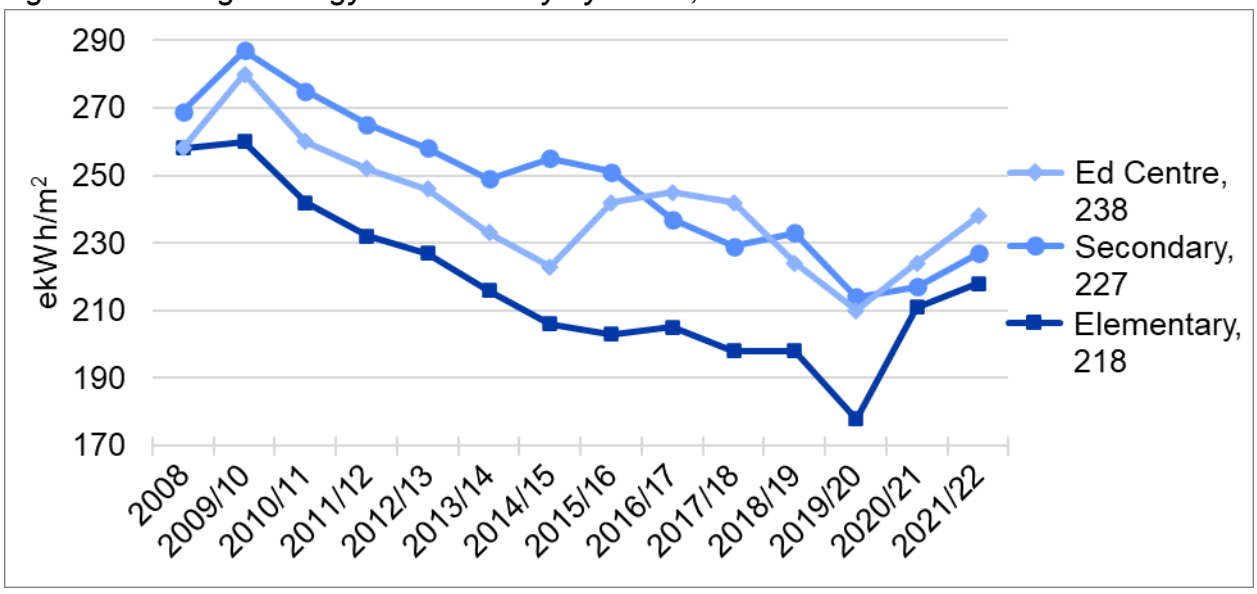


Figure 2: Average Energy Use Intensity by Panel, 2008 to Fiscal Year 2021/22



2021/22 Greenhouse Gas Emissions

Total greenhouse gas (GHG) emissions per square meter (GHG emission intensity) for all Board-owned sites is shown in Figure 3. Figure 4 reports the average GHG emission intensity by the panel. Note that this data is not weather normalized. The GHG emission intensity increased in 2021/22 due to COVID-19 ventilation requirements and other factors. GHG emissions intensities for each school are presented in Appendix C and D.

Total GHG Emission Intensity has reduced by 31 percent since 2008. The Board's GHG emissions are significantly influenced by GHG emissions from electricity generation in Ontario. The **emissions from electricity generation have fallen by 75 percent in Ontario** in the last decade. They were lowest in 2017/18, but they have begun to increase slightly as the province relies more heavily on natural gas generation.

Figure 3: Total GHG Emission Intensity Combined, 2008 to Fiscal Year 2021/22

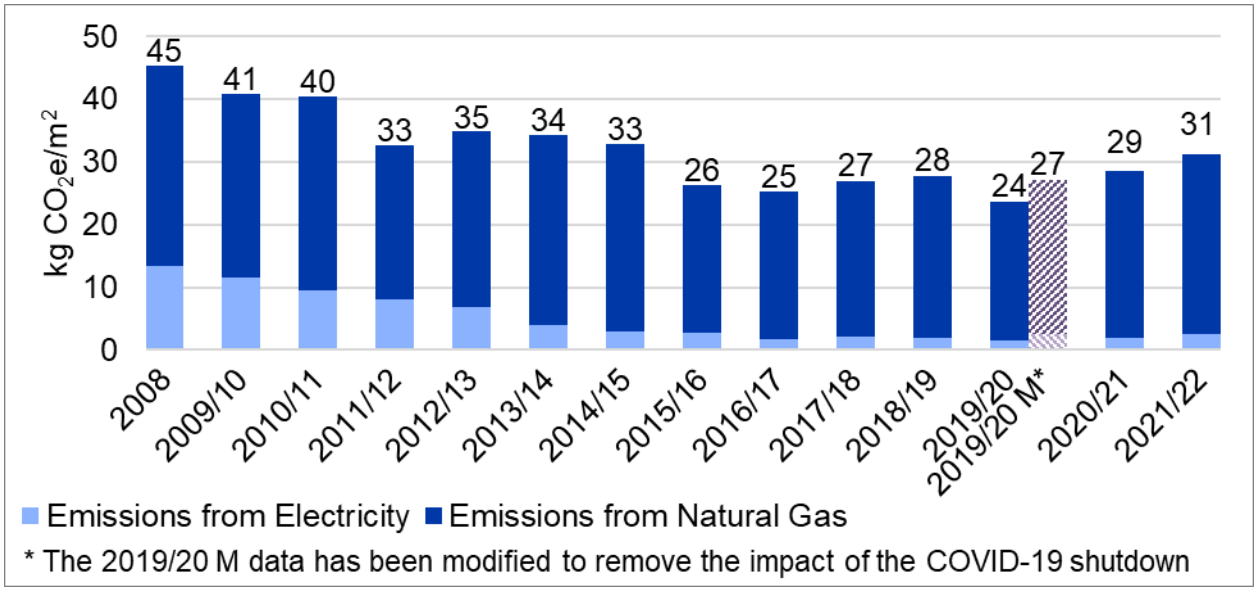
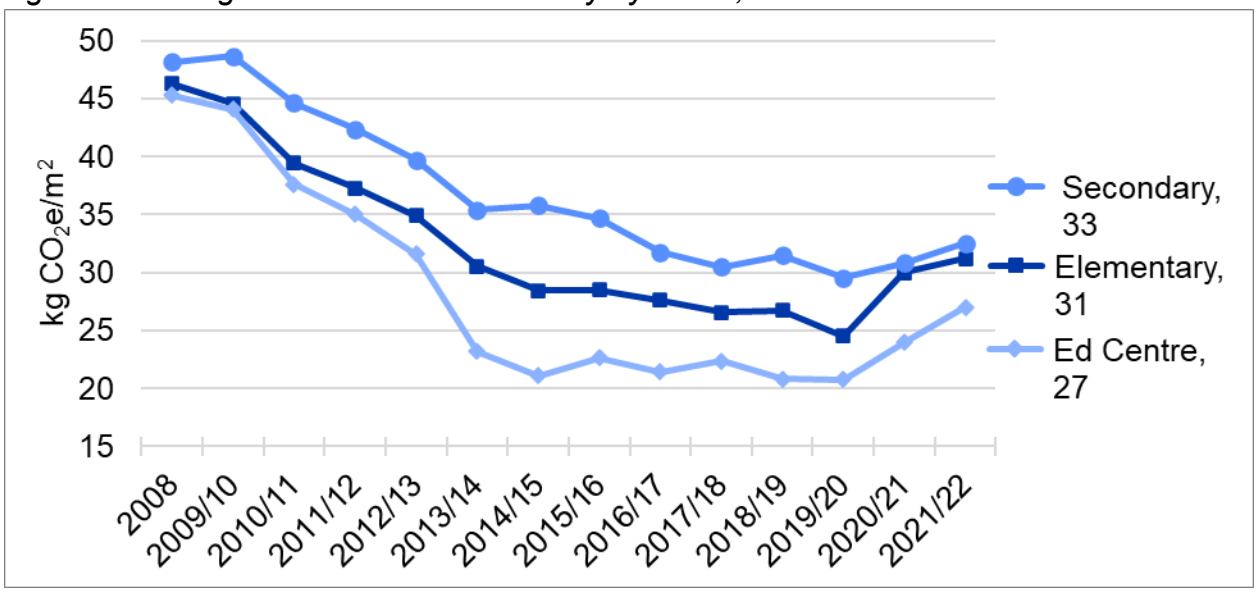


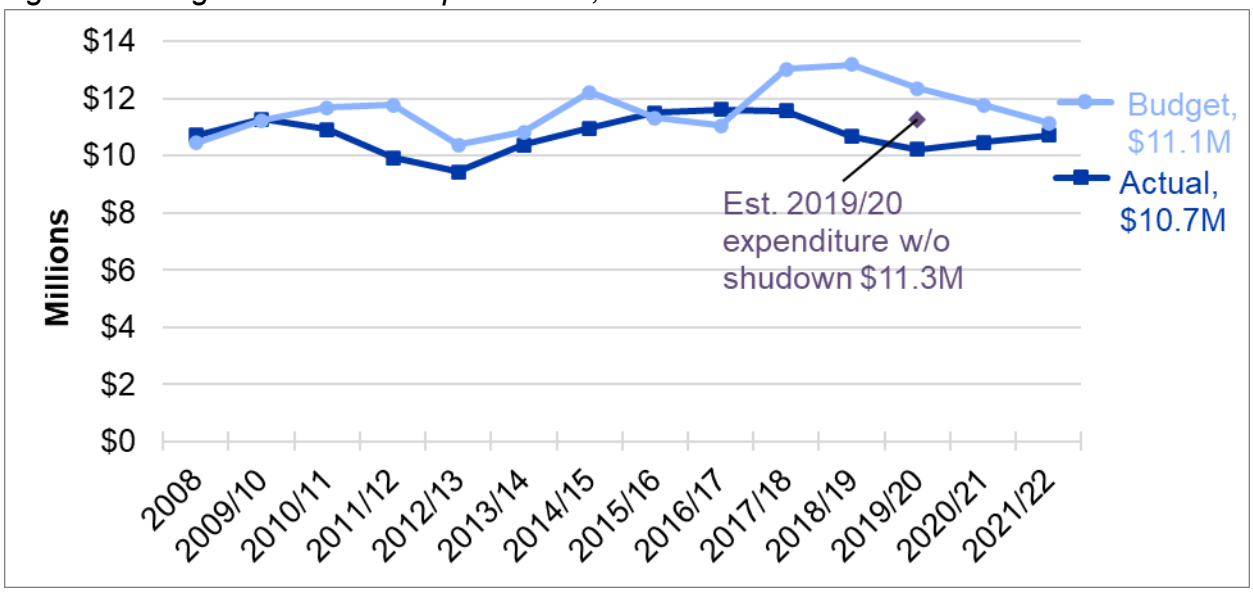
Figure 4: Average GHG Emission Intensity by Panel, 2008 to Fiscal Year 2021/22



Energy Budget and Expenditure

A **fourteen-year history of the Board budgets and expenditures** for electricity and natural gas is presented in Figure 5 and Appendix E. The Board's natural gas and electricity **budget for 2021/22 was $11.1M and expenditures were $10.7M**.

Figure 5: Budget and Actual Expenditures, Fiscal Years 2008/09 to 2021/22



Budget and actual expenses cannot be compared directly year over year as a metric for operational efficiencies, as there are too many variables beyond the control of Facility Services, and the Board as a whole. Consumption and prices are the two drivers of energy expenditures. While consumption can be influenced in the long term with energy conservation strategies, there are several factors beyond the Board's control:

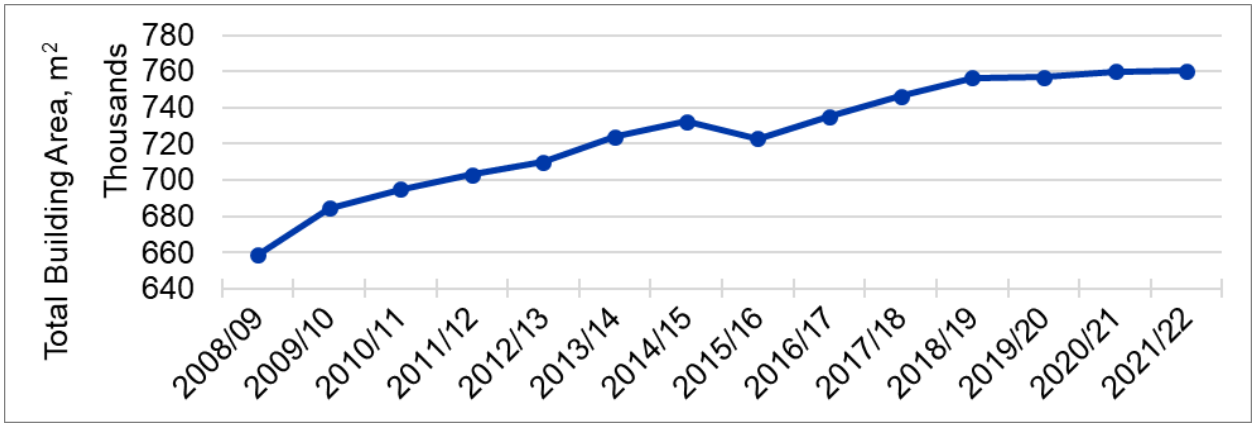
- Weather (i.e. warmer summer and shoulder season drives cooling demand)
- Hours of operation (i.e. extended use initiatives such as Community Use)
- School closures (i.e. disposal of surplus sites, port-a-packs, and portables)

- Expansion of facilities and square footage (i.e. new schools or school additions)
- User behaviour (influenced through conservation strategy but not controlled)

Energy prices are also outside the Board's control and fluctuate from year to year. The best prediction of all relevant variables is made when the budget is created but forecasting weather a year and more away does not allow for a great degree of precision.

It is a significant achievement that the utility budget has only increased 7 percent since 2008/09, and expenditures have remained flat. Since 2008/09, the total building area operated by the WRDSB has increased 15 percent (Figure 6), and the combined energy price the Board pays has increased 3 percent (Figure 7). Operating hours have also increased significantly due to increased community use of schools. **Efficiency gains continue to be the primary reason for flat energy expenditures since 2008/09**.

Figure 6: Total Building Area, Fiscal Years 2008/09 to 2021/22



In 2021/22, **natural gas cost 3.28 cents per ekWh** and **electricity cost 14.2 cents per kWh** with a combined cost of 6.43 cents per ekWh. The full history of energy costs is given in Figure 7. Natural gas costs have begun to increase as the price of the commodity has gone up, and the Federal carbon tax program is phased-in. Electricity prices continue to fall as the Ontario Government shifts costs from the Global Adjustment to the tax base.

Consumption by commodity drives expenditures. **Natural gas continues to be at a comparatively low cost to electricity**, although the carbon tax is narrowing this gap. A greater reliance on natural gas as a resource for heating continues to be **beneficial for our operational budget but generates greater GHG emissions** than utilizing electricity as a source of heat. The composition of energy consumption and expenditures for each commodity in 2021/22 is presented in Figure 8.

The reduction in EUI since 2008 has resulted in significant financial savings. **Utility costs have been offset by $2.3M in Fiscal Year 2021/22**, compared to the operational conditions in 2008. See Figure 9 for details. This figure compares the 2021/22 expenditures to the scenario where the Board operated the 2021/22 building portfolio with the EUI the Board operated at in 2008. This is an annual offset in utility costs that fluctuates based on actual consumption and market prices of energy. **Cumulatively**, **over the last decade, the reduction in EUI has offset utility costs by $19.9M.**

Figure 7: Natural Gas, Electricity and Combined costs per kWh, 2008 to 2021/22

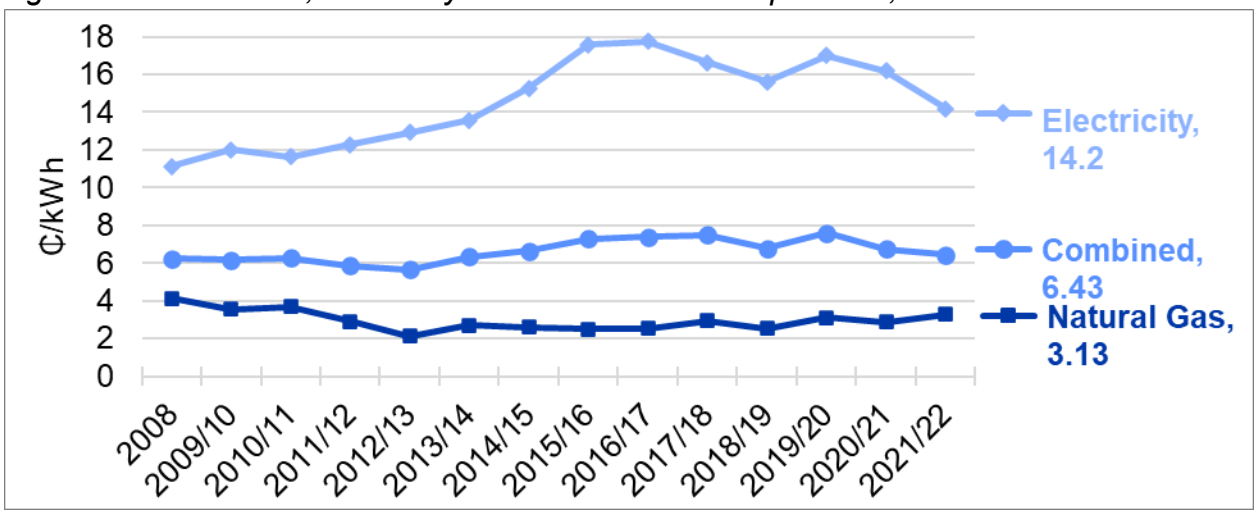


Figure 8: Energy Consumption (ekWh) and Expenditures by Commodity, 2021/22

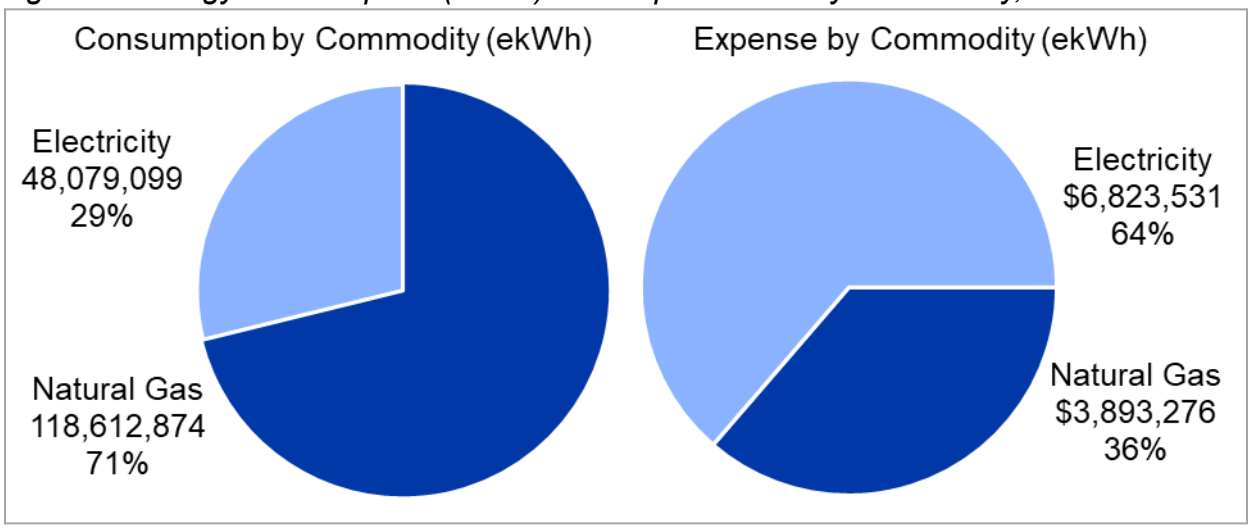
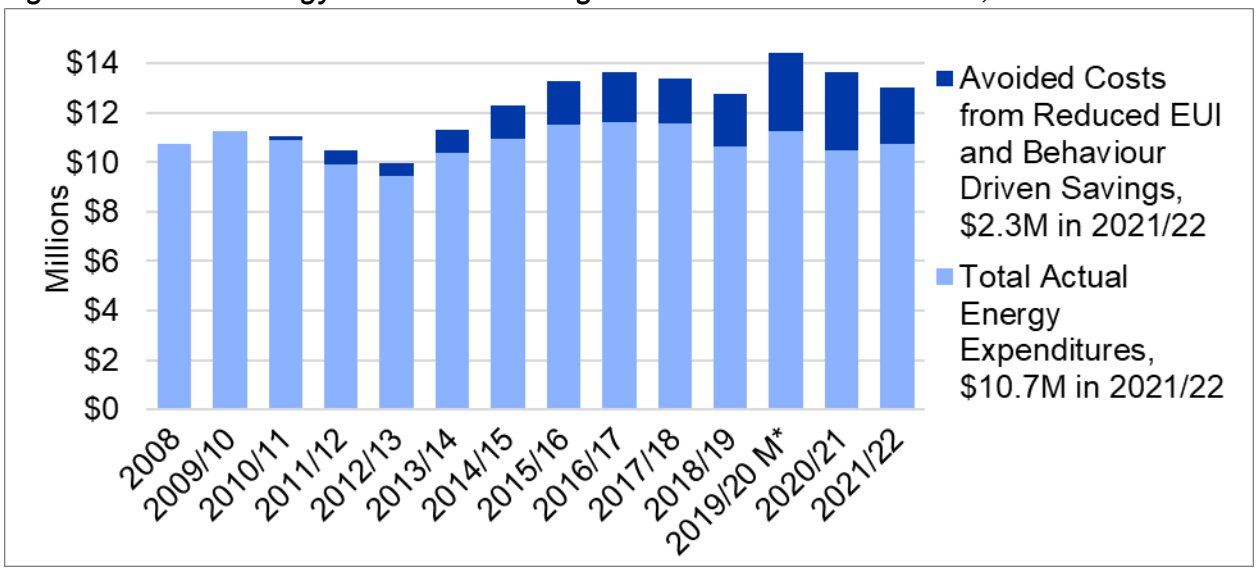


Figure 9: Actual Energy Costs and Savings Relative to 2008 Baseline, 2008 to 2021/22



The Energy Conservation Program

This report has detailed the significant success the energy conservation program has had in the last twelve years. This program consists of the following efforts:

- Careful collection and monitoring of utility consumption data through an online dashboard and weather-normalized annual database
- Upgrading to Light Emitting Diodes (LED) lights controlled by occupancy sensors
- Building Automation Systems with free cooling, schedules and night setbacks
- Demand controlled ventilation using CO_2 sensors (pre-COVID)
- Memos to staff on use of vestibules and water conservation
- The Sustainability Working Group, where staff collaborate and share knowledge
- Implementation of a preventative maintenance program
- Requiring new schools to be 25 percent more efficient than required by code
- Architectural design briefs for roofs, windows, and vestibules
- Recommissioning of boilers and HVAC equipment
- Use of efficient equipment like condensing boilers/water heaters, compressors
- Alternative methods of cooling classrooms such as destratification fans
- Pilot studies such as new multizone units, energy audits, gas-fired heat pump systems, surfactants in boiler loops, load-shedding cooling controls for secondary schools, point-of-use utility meters, and building envelope thermography,

WRDSB staff also make good use of existing incentive programs. **Since 2009, the Board has received more than $817k in incentives from the local utilities**. These incentives continue to be reinvested each year into the energy conservation program. Appendix F details how these incentives were used in 2021/22. The Board also operates five photovoltaic solar panel arrays, funded by the Ministry in 2010/11. These projects have generated more than $504,880 in revenue, as detailed in Appendix F.

Commitments

WRDSB is required to submit an Energy Conservation and Demand Management (ECDM) plan every 5 years by the Electricity Act. The WRDSB submitted the required ECDM plan for the five years following 2017/2018 in 2020. In this plan, the WRDSB accessed plans for capital and operational funds and set a target of an 11.8 percent decrease in Energy Use Intensity from 2017/18 levels by 2022/23. Due to the COVID-19 pandemic and other factors, the WRDSB is not on track to meet this target.

The Electricity Act requires the WRDSB to approve and submit a new ECMD Plan by July 2024. This new ECDM plan will report on energy consumption in the years 2018/19 through 2022/23, and report on the plan for energy conservation for the years 2023/24 through 2027/28. As part of the updated ECDM plan, staff will be considering options to further improve our energy conservation.

Financial Implications

While the utility budget represents less than two percent of the overall Board budget, the active management of the utility portfolio is required to mitigate risk exposure as cost overruns or savings can have a significant impact on the operating budget. There is

no way to reduce energy expenditure in the middle of a budget year. Long-term planning and action is the only way to reduce the financial risk of rising energy prices.

Electricity prices are expected to rise as nuclear power plants are taken offline and that capacity is replaced by expensive natural gas generation during the mid to late 2020s. Natural gas prices are expected to rise especially rapidly as both the carbon tax and commodity costs increase. Commodity increases are due to increasing exports from the United States to Asia and Europe which increases local demand.

The rate of energy price increase is likely to exceed the ability of the current energy conservation program to mitigate the need for budget increases on a year-to-year basis. Without a continued focus on energy conservation and new investments in energy-efficient technologies, volatility in the board's utility budget could represent a greater financial and operational risk by 2028/29.

Communications

The Electricity Act requires that this Energy Update be presented to the Board on an annual basis, and be made available to the public. In addition, the Energy Conservation and Demand Management Plan and the Energy Consumption and Greenhouse Gas Emission annual reports are available in hard copy at the Education Centre or online for public access:

- *Energy Conservation and Demand Management Plan*
- *Energy Conservation at the Waterloo Region District School Board*

This report will be shared with the Sustainability Working Group, the Elementary Accommodation Committee (EAC), and Secondary Accommodation Committee (SAC) in an effort to build momentum for energy conservation in the schools.

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in consultation with Leadership Council.

WATERLOO REGION DISTRICT SCHOOL BOARD
BUSINESS SERVICES DIVISION
FACILITY SERVICES DEPARTMENT

ENERGY UPDATE
ANNUAL ENERGY USE INTENSITY (ekWh/m^2) - ELEMENTARY SCHOOLS

School	08		17/18	18/19	19/20	20/21	21/22
Abraham Erb P.S.	189		146	150	134	187	178
Alpine P.S.	287		286	252	255	291	280
Avenue Road P.S.	242		173	180	173	215	241
Ayr P.S.	238		212	217	202	228	241
Baden P.S.	232		160	160	147	181	202
Blair O.E.C.	Un.		220	229	200	203	159
Blair Road P.S.	422		190	196	182	262	264
Blue Heron P.S.	260		200	173	140	205	200
Breslau P.S.	336		219	213	178	249	227
Bridgeport P.S.	246		172	176	159	197	212
Brigadoon P.S.	199		168	168	151	179	183
Cedar Creek P.S.	211		185	187	172	192	187
Cedarbrae P.S.	289		225	258	228	297	244
Centennial (Camb) P.S.	269		226	230	215	268	260
Centennial (Wloo) P.S.	389		238	232	235	204	196
Central P.S.	269		214	223	207	265	253
Chalmers Street P.S.	265		206	211	191	218	202
Chicopee Hills P.S.	N.O.		151	125	115	154	164
Clemens Mill P.S.	223		219	212	174	184	204
Conestogo P.S.	261		212	220	189	300	212
Coronation P.S.	440		343	349	336	288	315
Country Hills P.S.	190		170	175	163	196	182
Courtland Senior P.S.	246		203	210	170	227	255
Crestview P.S.	242		288	266	210	245	232
Dickson P.S.	184		Dis.	Dis.	Dis.	Dis.	Dis.
Doon P.S.	279		196	189	165	221	219
Driftwood Park P.S.	232		159	163	127	161	186
Edna Staebler P.S.	N.O.		142	145	131	179	189
Elgin Street P.S.	196		220	225	204	226	212
Elizabeth Ziegler P.S.	272		180	187	171	188	194
Empire P.S.	238		207	210	198	248	251
Floradale P.S.	209		177	189	174	225	253
Forest Glen P.S.	281		205	210	197	242	249
Forest Hill P.S.	316		227	217	219	197	214
Franklin P.S.	236		241	216	200	277	303
Glencairn P.S.	156		185	162	176	174	169
GrandView (Camb) P.S.	230		156	163	137	189	193
Grandview (NH) P.S.	197		189	204	192	244	248
Groh P.S.	N.O.		125	136	109	137	163
Hespeler P.S.	206		165	166	156	146	419

WATERLOO REGION DISTRICT SCHOOL BOARD
BUSINESS SERVICES DIVISION
FACILITY SERVICES DEPARTMENT

ENERGY UPDATE
ANNUAL ENERGY USE INTENSITY (ekWh/m^2) - ELEMENTARY SCHOOLS

School	08		17/18	18/19	19/20	20/21	21/22
Highland P.S.	326		203	210	189	263	240
Hillcrest P.S.	232		158	169	161	230	213
Hillside P.S.	212		185	199	158	163	265
Howard Robertson P.S.	407		285	282	267	313	294
J F Carmichael P.S.	217		163	176	168	236	258
J.W. Gerth P.S.	N.O.		144	139	118	173	181
Janet Metcalf P.S.	N.O.		N.O.	151	115	132	149
Jean Steckle P.S.	N.O.		127	125	102	140	151
John Darling P.S.	179		178	180	156	211	218
John Mahood P.S.	323		178	192	164	199	196
Keatsway P.S.	250		147	147	130	161	159
King Edward P.S.	594		236	211	203	220	258
Lackner Woods P.S.	192		223	212	179	219	200
Laurelwood P.S.	223		177	181	169	196	184
Laurentian P.S.	293		242	224	192	248	225
Lester B. Pearson P.S.	217		142	146	129	210	216
Lexington P.S.	307		230	231	217	236	251
Lincoln Avenue P.S.	289		Dis.	Dis.	Dis.	Dis.	Dis.
Lincoln Heights P.S.	298		213	211	206	233	234
Linwood P.S.	356		210	206	193	219	233
MacGregor Sr P.S.	201		204	222	225	219	216
MacKenzie King P.S.	294		214	208	198	225	242
Manchester P.S.	281		138	163	151	175	184
Margaret Avenue P.S.	229		238	235	232	265	283
Mary Johnston P.S.	174		155	158	145	181	197
McQuarrie Centre	539		261	250	278	227	212
Meadowlane P.S.	225		251	226	196	233	213
Millen Woods P.S.	N.O.		156	156	139	206	222
Moffat Creek P.S.	N.O.		128	99	105	101	162
N A MacEachern P.S.	326		197	151	212	293	299
New Dawn	412		146	347	348	271	301
New Dundee P.S.	188		198	195	184	208	206
Northlake Woods P.S.	311		194	209	180	182	194
Park Manor P.S.	341		353	355	234	210	232
Parkway P.S.	289		233	223	217	278	303
Pioneer Park P.S.	236		225	198	194	234	204
Preston P.S.	180		168	168	155	199	207
Prueter P.S.	169		212	204	217	249	374
Queen Elizabeth P.S.	220		241	232	221	206	221
Queensmount Sr P.S.	400		304	255	150	155	172

WATERLOO REGION DISTRICT SCHOOL BOARD
BUSINESS SERVICES DIVISION
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ENERGY UPDATE
ANNUAL ENERGY USE INTENSITY (ekWh/m^2) - ELEMENTARY SCHOOLS

School	08		17/18	18/19	19/20	20/21	21/22
Riverside P.S.	N.O.		136	136	116	149	162
Riverside (old location)	171		91	94	91	86	88
Rockway P.S.	265		285	299	217	242	236
Rosemount P.S.	245		292	Dis.	Dis.	Dis.	Dis.
Saginaw P.S.	250		218	207	185	272	260
Sandhills P.S.	238		194	189	172	253	242
Sandowne P.S.	285		181	175	170	185	208
Sheppard P.S.	224		252	230	200	236	255
Silverheights P.S.	229		143	148	132	177	181
Sir Adam Beck P.S.	N.O.		132	132	121	152	168
Smithson P.S.	216		234	222	221	251	213
Southridge P.S.	284		292	288	242	315	258
St Andrew's P.S.	247		164	158	154	178	176
St Jacobs P.S.	236		223	223	239	281	253
Stanley Park P.S.	299		251	282	243	280	245
Stewart Avenue P.S.	270		169	170	152	194	189
Suddaby P.S.	149		150	151	135	169	178
Sunnyside P.S.	226		186	202	174	184	230
Tait Street P.S.	227		177	180	169	210	207
Three Bridges P.S.	193		Dis.	Dis.	Dis.	Dis.	Dis.
Trillium P.S.	262		227	250	231	212	229
Vista Hills P.S.	N.O.		131	129	128	126	191
W.T. Townshend P.S.	158		133	134	119	165	181
Wellesley P.S.	243		205	196	177	193	210
Westheights P.S.	309		233	210	181	233	238
Westmount P.S.	244		137	128	99	162	181
Westvale P.S.	151		132	151	127	168	183
William G. Davis P.S.	308		261	217	237	215	Un.
Williamsburg P.S.	159		145	149	133	167	204
Wilson Avenue P.S.	225		181	195	183	205	199
Winston Churchill P.S.	217		194	196	177	196	212
Woodland Park P.S.	177		127	139	130	156	162
Wrigley's Corners O.E.C.	Un.		228	255	201	190	189
Average Energy Use Intensity (ekWh/m^2)	**258**		**198**	**197**	**179**	**211**	**218**

N.O. - Not Open Un. - Unavailable Dis. - Disposed

Markes break between 2008 and 2017/18

WATERLOO REGION DISTRICT SCHOOL BOARD
BUSINESS SERVICES DIVISION
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ENERGY UPDATE
ANNUAL ENERGY USE INTENSITY (ekWh/m^2) - SECONDARY SCHOOLS

School	08		17/18	18/19	19/20	20/21	21/22
Bluevale C.I.	274		230	228	242	235	234
Cameron Heights C.I.	385		313	305	259	189	233
Eastwood C.I.	211		205	239	191	219	268
Elmira District S.S.	278		220	239	219	234	233
Forest Heights C.I.	325		296	295	239	247	275
Galt C.I.	254		241	254	241	220	212
Glenview Park S.S.	275		201	202	190	193	196
Grand River C.I.	244		220	227	225	201	210
Huron Heights S.S.	252		226	222	210	212	205
Jacob Hespeler S.S.	219		184	196	184	224	191
Kitchener-Waterloo C.&V.S.	291		223	229	196	198	230
Laurel Heights S.S.	246		206	192	182	222	239
Preston H.S.	260		254	239	235	228	219
Southwood S.S.	275		157	160	156	154	171
Waterloo C.I.	265		240	239	194	214	245
Waterloo-Oxford District S.S.	243		248	260	255	284	268
Average Energy Use Intensity (ekWh/m^2)	**269**		**229**	**233**	**214**	**217**	**227**
Education Centre (ekWh/m^2)	**258**		**242**	**224**	**210**	**224**	**238**

Markes break between 2008 and 2017/18

WATERLOO REGION DISTRICT SCHOOL BOARD
BUSINESS SERVICES DIVISION - FACILITY SERVICES DEPARTMENT

ENERGY UPDATE

ANNUAL GREENHOUSE GAS EMISSION INTENSITY ($kgCO_2e/m^2$)

ELEMENTARY SCHOOLS

School	08	17/18	18/19	19/20	20/21	21/22
Abraham Erb P.S.	34	18	18	18	27	24
Alpine P.S.	51	40	34	38	42	40
Avenue Road P.S.	44	23	24	25	31	35
Ayr P.S.	43	29	29	29	34	36
Baden P.S.	41	17	18	19	23	27
Blair O.E.C.	Un.	31	33	30	31	26
Blair Road P.S.	75	20	20	20	31	33
Blue Heron P.S.	47	22	21	19	28	27
Breslau P.S.	61	29	28	25	37	33
Bridgeport P.S.	44	22	23	22	27	31
Brigadoon P.S.	35	15	15	15	19	20
Cedar Creek P.S.	38	19	24	23	27	26
Cedarbrae P.S.	52	32	38	34	46	37
Centennial (Camb) P.S.	48	32	32	32	41	40
Centennial (Wloo) P.S.	70	31	31	34	29	28
Central P.S.	49	32	33	32	42	39
Chalmers Street P.S.	48	25	25	25	30	27
Chicopee Hills P.S.	N.O.	20	15	14	21	22
Clemens Mill P.S.	40	24	23	20	20	24
Conestogo P.S.	47	28	31	27	47	31
Coronation P.S.	80	53	53	54	46	50
Country Hills P.S.	33	18	20	21	25	23
Courtland Senior P.S.	44	30	32	26	36	41
Crestview P.S.	44	45	41	33	38	36
Dickson P.S.	33	Dis.	Dis.	Dis.	Dis.	Dis.
Doon P.S.	50	27	26	23	32	32
Driftwood Park P.S.	41	15	16	13	17	21
Edna Staebler P.S.	N.O.	16	18	18	26	27
Elgin Street P.S.	35	28	28	27	30	29
Elizabeth Ziegler P.S.	49	26	27	26	28	29
Empire P.S.	43	26	27	27	36	35
Floradale P.S.	37	20	22	22	29	34
Forest Glen P.S.	50	25	26	27	34	35
Forest Hill P.S.	57	33	32	34	30	33
Franklin P.S.	42	34	29	30	42	48
Glencairn P.S.	28	25	21	25	25	23
GrandView (Camb) P.S.	41	16	18	16	24	23
Grandview (NH) P.S.	36	26	28	28	36	37
Groh P.S.	N.O.	16	16	13	17	20
Hespeler P.S.	36	17	17	18	16	65

WATERLOO REGION DISTRICT SCHOOL BOARD
BUSINESS SERVICES DIVISION - FACILITY SERVICES DEPARTMENT

ENERGY UPDATE

ANNUAL GREENHOUSE GAS EMISSION INTENSITY ($kgCO_2e/m^2$)

ELEMENTARY SCHOOLS

School	08		17/18	18/19	19/20	20/21	21/22
Highland P.S.	59		29	29	26	41	35
Hillcrest P.S.	41		21	23	23	35	31
Hillside P.S.	38		22	24	20	21	39
Howard Robertson P.S.	74		43	42	41	48	45
J F Carmichael P.S.	39		22	25	25	37	41
J.W. Gerth P.S.	N.O.		17	16	15	24	25
Janet Metcalf P.S.	N.O.		N.O.	19	15	17	20
Jean Steckle P.S.	N.O.		10	11	11	18	19
John Darling P.S.	32		25	25	22	33	33
John Mahood P.S.	58		20	22	21	27	26
Keatsway P.S.	45		16	16	16	20	19
King Edward P.S.	108		37	32	32	34	40
Lackner Woods P.S.	34		26	23	21	27	22
Laurelwood P.S.	39		19	20	21	24	22
Laurentian P.S.	53		37	34	30	40	36
Lester B. Pearson P.S.	38		15	16	16	29	30
Lexington P.S.	55		33	33	33	35	37
Lincoln Avenue P.S.	52		Dis.	Dis.	Dis.	Dis.	Dis.
Lincoln Heights P.S.	54		31	30	32	37	37
Linwood P.S.	64		29	29	29	33	35
MacGregor Sr P.S.	36		28	31	33	31	30
MacKenzie King P.S.	53		30	29	30	33	36
Manchester P.S.	51		17	21	21	25	26
Margaret Avenue P.S.	41		35	34	35	41	44
Mary Johnston P.S.	31		20	20	21	26	29
McQuarrie Centre	98		44	42	47	38	36
Meadowlane P.S.	40		28	24	20	27	24
Millen Woods P.S.	N.O.		17	17	17	27	30
Moffat Creek P.S.	N.O.		14	9	12	11	22
N A MacEachern P.S.	58		23	9	25	38	40
New Dawn	75		22	57	56	43	49
New Dundee P.S.	34		29	30	29	33	33
Northlake Woods P.S.	56		23	27	24	24	25
Park Manor P.S.	61		53	53	34	29	34
Parkway P.S.	52		29	25	28	37	42
Pioneer Park P.S.	42		30	26	27	34	28
Preston P.S.	32		21	21	21	28	29
Prueter P.S.	30		31	30	34	40	62
Queen Elizabeth P.S.	40		37	36	34	32	33
Queensmount Sr P.S.	72		44	37	21	22	25

WATERLOO REGION DISTRICT SCHOOL BOARD
BUSINESS SERVICES DIVISION - FACILITY SERVICES DEPARTMENT

ENERGY UPDATE

ANNUAL GREENHOUSE GAS EMISSION INTENSITY ($kgCO_2e/m^2$)
ELEMENTARY SCHOOLS

School	08		17/18	18/19	19/20	20/21	21/22
Riverside P.S.	30		17	14	15	20	23
Riverside (old location)	N.O.		14	17	13	12	14
Rockway P.S.	48		45	48	35	39	37
Rosemount P.S.	44		48	Dis.	Dis.	Dis.	Dis.
Saginaw P.S.	44		26	25	24	38	35
Sandhills P.S.	42		24	22	22	37	35
Sandowne P.S.	51		22	21	23	25	29
Sheppard P.S.	40		37	34	30	37	40
Silverheights P.S.	41		14	14	15	22	23
Sir Adam Beck P.S.	N.O.		14	15	15	19	23
Smithson P.S.	39		37	34	35	39	33
Southridge P.S.	51		43	45	39	51	40
St Andrew's P.S.	44		22	22	23	27	27
St Jacobs P.S.	43		32	32	36	44	38
Stanley Park P.S.	54		37	42	37	45	38
Stewart Avenue P.S.	48		21	21	21	27	26
Suddaby P.S.	27		23	23	22	27	28
Sunnyside P.S.	41		27	30	27	28	36
Tait Street P.S.	41		23	23	24	31	31
Three Bridges P.S.	35		Dis.	Dis.	Dis.	Dis.	Dis.
Trillium P.S.	47		26	30	30	27	28
Vista Hills P.S.	N.O.		16	14	15	14	25
W.T. Townshend P.S.	28		15	16	16	23	25
Wellesley P.S.	44		29	28	27	29	32
Westheights P.S.	55		25	20	19	28	29
Westmount P.S.	43		15	14	11	21	23
Westvale P.S.	27		11	13	13	18	20
William G. Davis P.S.	56		40	33	38	34	Un.
Williamsburg P.S.	28		17	17	16	22	28
Wilson Avenue P.S.	40		22	25	25	28	28
Winston Churchill P.S.	39		23	24	23	26	28
Woodland Park P.S.	31		13	16	16	20	21
Wrigley's Corners O.E.C.	Un.		40	48	36	36	36
Average GHG Emission Intensity ($kg\ CO_2e/m^2$)	**46**		**26**	**26**	**25**	**30**	**30**

N.O. - Not Open Un. - Unavailable Dis. - Disposed
Markes break between 2008 and 2017/18

WATERLOO REGION DISTRICT SCHOOL BOARD
BUSINESS SERVICES DIVISION
FACILITY SERVICES DEPARTMENT

ENERGY UPDATE

ANNUAL GREENHOUSE GAS EMISSION INTENSITY (kg CO_2e/m^2)

SECONDARY SCHOOLS

School	08	17/18	18/19	19/20	20/21	21/22
Bluevale C.I.	49	30	30	34	32	32
Cameron Heights C.I.	69	39	38	35	24	34
Eastwood C.I.	38	24	30	26	30	37
Elmira District S.S.	50	30	33	32	34	33
Forest Heights C.I.	59	44	43	35	37	42
Galt C.I.	46	32	35	36	33	31
Glenview Park S.S.	50	28	28	28	29	30
Grand River C.I.	44	29	30	33	29	30
Huron Heights S.S.	45	24	24	26	26	25
Jacob Hespeler S.S.	39	21	22	23	30	25
Kitchener-Waterloo C.&V.S.	52	31	32	28	29	34
Laurel Heights S.S.	44	21	20	22	29	31
Preston H.S.	47	37	35	36	35	33
Southwood S.S.	49	20	21	22	22	25
Waterloo C.I.	48	34	33	28	31	36
Waterloo-Oxford District S.S.	44	36	37	38	44	41
Average GHG Emission Intensity (kg CO_2e/m^2)	**48**	**30**	**31**	**30**	**31**	**33**
Education Centre (kg CO_2e/m^2)	**45**	**21**	**20**	**22**	**24**	**27**

Markes break between 2008 and 2017/18

WATERLOO REGION DISTRICT SCHOOL BOARD
BUSINESS SERVICES DIVISION
FACILITY SERVICES DEPARTMENT

ENERGY UPDATE
ENERGY BUDGET AND EXPENDITURES

Commodity	2008/09	
	Budget	Actual
Electricity	$ 4,616,900	$ 5,755,988
Natural Gas	$ 5,832,400	$ 4,966,345
Total	**$ 10,449,300**	**$ 10,722,333**

Commodity	2017/18		2018/19	
	Budget	Actual	Budget	Actual
Electricity	$ 10,303,000	$ 8,510,009	$ 10,182,000	$ 7,956,894
Natural Gas	$ 2,714,000	$ 3,044,841	$ 2,997,500	$ 2,698,385
Total	**$ 13,017,000**	**$ 11,554,850**	**$ 13,179,500**	**$ 10,655,278**

Commodity	2019/20		2020/21	
	Budget	Actual	Budget	Actual
Electricity	$ 9,380,000	$ 7,364,388	$ 8,854,500	$ 7,325,544
Natural Gas	$ 2,971,500	$ 2,846,183	$ 2,911,500	$ 3,148,469
Total	**$ 12,351,500**	**$ 10,210,571**	**$ 11,766,000**	**$ 10,474,013**

Commodity	2021/22	
	Budget	Actual
Electricity	$ 7,788,400	$ 6,823,531
Natural Gas	$ 3,344,500	$ 3,893,276
Total	**$ 11,132,900**	**$ 10,716,807**

WATERLOO REGION DISTRICT SCHOOL BOARD
BUSINESS SERVICES DIVISION
FACILITY SERVICES DEPARTMENT

ENERGY UPDATE
ENERGY CONSERVATION ADDITIONAL REVENUE STREAMS

PHOTOVOLTAIC GENERATION AND REVENUES (LIFETIME)*

	kWh Production	Revenue
Blair Road P.S.	118,950	$ 95,398
Forest Glen P.S	133,445	$ 107,023
Forest Heights C.I.	115,456	$ 92,596
Lincoln Heights P.S.	120,120	$ 96,336
Waterloo C.I.	141,555	$ 113,527
Total	**629,526**	**$ 504,880**

* Reports energy produced between November 2011 and August 2022.

Links to websites are as follows:

Blair Road P.S.	http://www.cachelan.com/green/solarVuLive.php?ac=blairrdps&dr=dakon
Forest Glen P.S.	http://www.cachelan.com/green/solarVu.php?ac=forestglenps
Forest Heights C.I.	http://www.foresthtsc.solarvu.net/green/solarVu.php?ac=foresthtsc
Lincoln Heights P.S.	http://lincolnhgtsps.solarvu.net/green/solarVuLive.php?ac=lincolnhgtsps
Waterloo C.I.	http://www.waterlooci.solarvu.net/green/solarVu.php?ac=waterlooci

2021/22 Utility Rebates Reinvestments ($51,000)

BCI, Clemens Mills, GRCI, and 8 others	Electrical sub-metering for chillers
Blue Heron and Cedar Creek	Recommissioning of building controls
Margaret Ave, Breslau	Water conservation inspection
EDSS, Franklin, and 4 others	Water monitoring equipment
Alpine, Parkway, HHSS	LED interior lighting in portables
Blair OED	Energy saving boiler loop additive trial

2021/22 Capital Funded Energy Efficiency Upgrades ($200,000)

Brigadoon, ECI, EDSS and 30 others	LED interior lighting in 110 portables
Courtland Ave, GCI, and 5 others	LED exterior lighting upgrade
Stewart Ave, Chalmers St, Hespeler PS	LED lighting upgrades
CHCI	Upgrade to low flush Water closets

Technical Background and Methodology

The unit equivalent kilowatt-hours (ekWh) allows electricity, normally measured in kWh, and natural gas and propane, normally measured in cubic meters and liters, respectively, to be added together. Natural gas and propane use are highly weather dependent as it is mostly used for space heating, so heating degree days are used to weather normalize the figures, removing the impact of weather which allows for a fair comparison between years. Electricity is not weather normalized, as the majority of its use is not weather dependent. The total energy consumption is divided by the total floor area of the board's asset portfolio so that the effect of additional building area from new schools and school additions is removed from the comparison. This results in the metric Energy Use Intensity, measured in ekWh per square meter. These figures include portables and port-a-packs. Leased facilities such as 151 Weber are excluded.

Unlike 2019/20, data for 2020/21 was not adjusted for the impact of COVID-19 due to the complexity of these impacts in 2020/21. In 2020/21, ventilation measures (increased outdoor air, improved filters, HEPA units, etc.) increased energy consumption from pre-COVID behaviour, while school shutdowns in the second half of the year decreased it. The ventilation measures are estimated to have increased natural gas usage by 13 percent. The school closures reduced energy use over these periods by approximately 10 percent. As COVID-19 and the ventilation adaptations are likely to continue to impact energy data, and there are long-term ways WRDSB can mitigate the energy impact of these adaptations, this report will no longer adjust the data for these impacts.

GHG emissions are calculated using the emission factors reported in Environment Canada's National Inventory Report to the UN Framework Convention on Climate Change. Emissions are reported in units of kilograms of carbon dioxide equivalent (kg CO_2e).