



2022 TOP ENERGY PERFORMING SCHOOL BOARDS REPORT

SUSTAINABLE SCHOOLS is pleased to present our 2022 report on the energy performance of school boards in Ontario, based on publicly reported annual data for the September 2019 – August 2020 school year. This was the first year when school board operations were affected by the COVID-19 pandemic. School closures were in effect from March 2020 while addressing ventilation requirements for health and safety became the top concern.

The Ontario history of school closures from March 2020 to the end of the 2020-2021 school year is shown below. We anticipate more substantive energy use changes in next year's analysis of the 2020-2021 school year, resulting from Ministry of Education directives relating to ventilation system modifications including outside air controls and air filtration.

This 2022 report is therefore a hybrid assessment of progress with

Ontario-Level School Closures and Reopening Policy Tracing, from March 2020 to April 2021



Source: The Ontario COVID-19 Science Advisory Table. <https://covid19-sciencetable.ca/sciencebrief/covid-19-and-education-disruption-in-ontario-emerging-evidence-on-impacts/>

energy efficiency under normal school operations from September 2019 to February 2020, together with the boards' operational responses to the early months of COVID-19 from March to August 2020.

Province-wide energy trends

Province-wide changes in energy use are derived by comparing the annual savings potential for each building between the two years (weather-normalized). These trends are presented below.

Actual Energy Reductions	2016-17 vs 2014-15	2017-18 vs 2016-17	2018-19 vs 2017-18	2019-20 vs 2018-19
Recorded electricity reductions	4.7%	-0.7%	1.4%	16.9%
Number of boards with net electricity reductions (out of 72)	54	23	50	68
Recorded natural gas reductions	1.7%	4.8%	-0.6%	4.3%
Number of boards with net natural gas reductions (out of 72)	23	54	37	49
% total energy reductions	2.8%	2.8%	0.1%	8.7%
Number of boards with board-wide energy reductions > 1% (out of 72)	44	44	36	59

Prior years' results from 2014-15 to 2018-19 in the first three columns document energy savings due to efficiency improvements in electricity and natural gas use made over that 4-year period. Results varied significantly from year to year and averaged a little less than 2% per annum for both energy types with a small majority of boards showing overall net total energy savings.

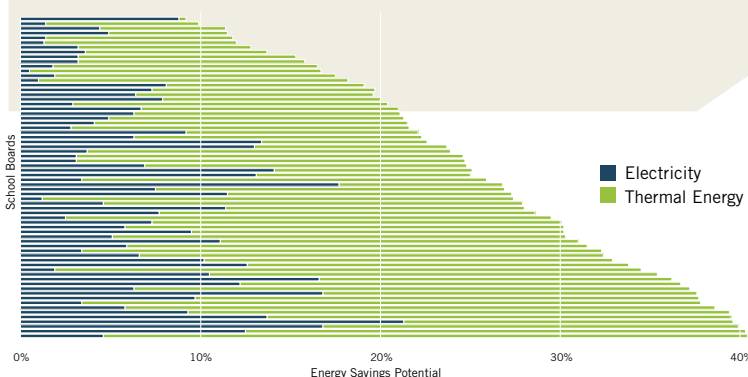
The current year results show a distinct jump in energy reductions for electricity (16.9%) and gas (4.3%) which can reasonably be attributed to the school closures from March 2020 when lights and, for a period of time, most ventilation systems were shut down. Closures would have a bigger impact on electricity (fan power and lighting as well as electric heat in portable classrooms) than on gas where base building heating is still required and the larger part of the heating season was over before the closures came into effect.

The most energy efficient school boards

The Top-20 most energy efficient school boards in Ontario for 2019-2020 are recognized below. For this 2019-2020 school year, the top-performing boards are again determined by comparing actual energy use to top-quartile energy targets for elementary and secondary schools and administration buildings. While most buildings and boards showed additional energy reductions due to COVID-19 response, the

established (weather-normalized) "normal operations" targets provide a consistent standard for evaluating the energy performance of individual buildings and the boards as a whole.

2022 Top Energy Performing School Boards

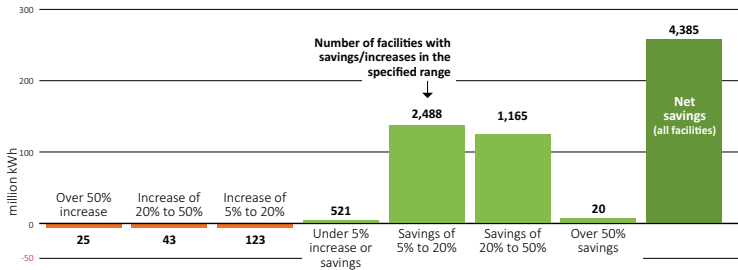


2022 Ranking	School Board	Number of facilities	2021 Ranking
1	Northwest Catholic District School Board	7	6
2	Halton Catholic District School Board	58	4
3	Ottawa Catholic School Board	87	1
4	York Catholic District School Board	101	9
5	Conseil scolaire de district catholique du Nouvel-Ontario	32	3
6	York Region District School Board	221	7
7	Superior-Greenstone District School Board	14	2
8	Durham District School Board	131	11
9	Kawartha Pine Ridge District School Board	81	14
10	Upper Canada District School Board	82	8
11	Simcoe County District School Board	115	18
12	Sudbury Catholic District School Board	17	5
13	Upper Grand District School Board	83	20
14	Conseil scolaire de district catholique Franco-Nord	12	15
15	Conseil scolaire public du Nord-Est de l'Ontario	13	26
16	Durham Catholic District School Board	50	25
17	Near North District School Board	37	17
18	Rainy River District School Board	15	21
19	District School Board Ontario North East	30	13
20	Ottawa-Carleton District School Board	150	23
Total	1336		

Variability in energy results

The remarkable range of year-on-year variances between schools and boards identified through this analysis provides further insight into opportunities for accelerating savings in future years. Primarily due to school closures caused by the pandemic, 3,673 buildings (84% of the total) recorded electricity reductions greater than 5% in 2019-20, amounting to over 269 million kWh. Still, 191 other buildings showed increases greater than 5%, somewhat offsetting those reductions. With thermal energy use, 42% of buildings reduced consumption

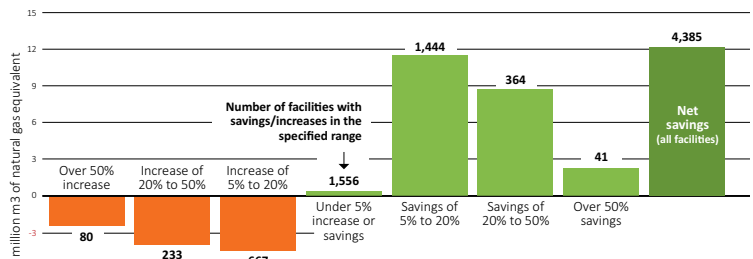
ELECTRICITY use trends: Cumulative savings or increases in Ontario school board facilities, by specified range, in 2019-20 vs 2018-19



by 22.2 million m³ of natural gas, while 22.3% of facilities recorded 10.5 million m³ of increases.

Since buildings with significant area changes are filtered out of this analysis, these energy increases are likely to be predominantly due to operational and maintenance factors. Avoiding these increases would substantially improve overall energy savings in future years. Boards are encouraged to use this information for their own buildings to improve operations, maintenance and management practices for early identification and correction of anomalies.

GAS use trends: Cumulative savings or increases in Ontario school board facilities, in the specified range, in 2019-20 vs 2018-19



Sustainable Schools in action

New: Strategic Energy Management for School Board Portfolios Project
Lead project funder: Independent Electricity System Operator (IESO)
Project partners: Setpoint Building Automation, QMC Metering Solutions
Project timeline: March – December 2022

This applied research project addresses the variability in energy results described above and aims to help boards identify and achieve operational energy savings in their schools. The research will identify the causes of substantial electricity and natural gas use savings and increases which are not related to known projects or use and occupancy changes. We are particularly interested in the role of operational and maintenance factors and local unreported actions undertaken by school staff and service contractors.

Working with 5 Ontario school boards and up to 5 schools from each board, Sustainable Schools will analyze monthly billing data, building automation systems, sub-meter data and the management practices of participating boards used to identify energy use variances in a timely manner and initiate and verify appropriate action. After the analysis stage, a strategic energy management workshop with all five school boards, the IESO, and project partners will determine the common factors and practices involved, leading to a best practices guidance report for use by all school boards in achieving operational savings, avoiding increases, and building on local successes to achieve their goals.

New: High Efficiency Rooftop HVAC Unit (RTU) Replacement Project
Lead project funder: Independent Electricity System Operator (IESO)
Project partners: Kilmer Environmental, Carmichael Engineering
Project timeline: May – December 2022

This project will develop an evidence-based best practices guidance document for use by school boards and their design consultants to optimize the design, equipment selection, BAS programming and commissioning of RTU replacement projects. The research team will work with 5 Ontario school boards to evaluate respective designs, operational performance, and energy efficiency of up to 10 recently retrofitted schools. In-depth examination of energy and operating data before and after the retrofit projects will determine absolute and comparative performance. Correlations between relative performance and design, equipment and other factors will help identify best practices. Alternative design and equipment options will be assessed, including capital and life-cycle costs, energy efficiency, greenhouse gas emissions and maintenance factors.

The guidance document will be reviewed and finalized in a strategic workshop with the participating boards and project partners, which will also explore the boards' internal capabilities and organizational alignment for project development, addressing knowledge gaps and areas for improvement with respect to energy efficiency and operating performance of their installations.

ABOUT THIS REPORT

The Sustainable Schools program has been reporting on highly efficient K-12 school buildings since 2007. For the past several years we have been using the publicly disclosed Broader Public Sector energy data for Ontario's approximately 5,000 school buildings to report on the comparative energy performance of the province's 72 boards. Sustainable Schools' data,

webinars and this annual report provide evidence-based knowledge and a platform for the whole sector to share, learn, make improvements and track progress over time. The reporting on individual schools provides the foundation for each board to begin mapping its own practical pathway to utility cost savings and emissions reductions.

The White Paper detailing our methodology is available on the Sustainable Schools website at <https://sustainableschools.ca/publications/>.

Sustainable Schools acknowledges the support of Enbridge Gas Distribution and the Independent Electricity System Operator (IESO).

For more information, please visit www.sustainableschools.ca or contact Katia Osokine, Program Manager, at kosokine@climatechallengenetwork.org.

Sustainable Schools is a program of the Climate Challenge Network.

Technical direction by