



Climate Action in the TDSB

To: Committee of the Whole

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Strategic Directions

- Transform Student Learning
- Create a Culture for Student and Staff Well-Being
- Build Strong Relationships and Partnerships Within School Communities to Support Student Learning and Well-Being
- Allocate Human and Financial Resources Strategically to Support Student Needs

Recommendation

It is recommended that:

- a) The Director develop a plan to reduce greenhouse gas emissions (GHG);
- b) The Director present a report in the fall of 2020 to share the plan.

Context

At its December 12, 2019 meeting, the Board of Trustees endorsed the City of Toronto's climate emergency declaration and asked the Director to report back on the TDSB's actions to address climate change, in terms of both climate literacy and facility operations.

Around the world, including in Toronto, youth are rallying behind the message of the young Swedish climate activist Greta Thunberg:

We all have a choice. We can create transformational action that will safeguard the living conditions for future generations. Or we can continue with our business as usual and fail... We must change almost everything in our current societies. The bigger your carbon footprint, the bigger your moral duty. The bigger your platform, the bigger your responsibility.

As an organization dedicated to preparing young people for their future, the TDSB has an obligation to respond to the escalating climate crisis with leadership and action.

Fortunately, the TDSB is not at the starting point. It has been engaged in climate action for 20 years. During this time, it has steadily reduced the energy intensity of its buildings by 25% as shown in Appendix A, spearheaded the EcoSchools movement spreading across Canada, and established numerous programs and partnerships to support and expand education for sustainability.

Twenty Years of Climate Action

This report provides an overview of two decades of work that the TDSB has done to tackle climate change and become more sustainable, both as an institution and as an educator.

As detailed in Appendix B, the overview is organized into four main sections:

- Part I looks at the TDSB's institutional context and initiatives that have supported climate action, including policies, targeted funding, consultation and youth engagement.
- Part II provides an overview of some of the key partnerships that support environmental action in schools.
- Part III addresses TDSB educational initiatives that support climate action, including EcoSchools, outdoor education, teacher education, and active, safe and sustainable transportation.
- Part IV addresses on-the-ground actions operations has taken related to school grounds, energy use in buildings, renewable energy, waste management and purchasing.

Accelerating GHG Reductions

According to the Intergovernmental Panel on Climate Change (IPCC), we have until about 2030 to shift to a low-carbon economy in order to minimize widespread catastrophic global climate impacts on health, food security, livelihoods, water supply, human security and economic wellbeing.

For this reason, the TDSB's Joint Management-Labour Environment Committee (JMLEC) and its Environmental Sustainability Community Advisory Committee (ESCAC) are advocating for more aggressive action to reduce the TDSB's greenhouse gas emissions, particularly from its buildings since it is a major property owner with a significant carbon footprint.

JMLEC and ESCAC are calling for the TDSB to develop a plan that includes interim targets to reduce GHGs with the goal of becoming net-zero by 2050. They also point out that the TDSB's 2019 [Energy Conservation and Demand Management Plan](#) calls for a 1% reduction in GHG annually for five years, which is not any more ambitious than what has been achieved over the last twenty years.

Staff agree that more work is required to reduce the TDSB's GHG emissions, and that more ambitious targets and interim goals are needed.

Given the magnitude of the effort required, the first step is to build internal capacity, particularly from an engineering and analytical point of view, to take on this significant undertaking. Until an appropriate technical team is in place to tackle the challenge, detailed planning and specific goal-setting are premature.

Action Plan and Associated Timeline

Over the coming months, staff will assemble a technical team, under the direction of the Senior Manager of Sustainability, who will put more emphasis on reducing the TDSB's greenhouse gas emission particularly from its very large building portfolio. Balanced with this approach will be a continuing effort to address the TDSB's \$3.8 billion backlog of major repairs. Once the team is in place, staff will be in a position to report to Board on its plan to reduce GHG emissions over the long term, along with interim targets.

Resource Implications

It is anticipated that the new technical team will be made up of seven existing staff, four from the Utilities Group and three from Design.

Communications Considerations

Not applicable at this time.

Board Policy and Procedure Reference(s)

- Policy P028 – The Environment

Appendices

- Appendix A: TDSB Building Energy Intensity
- Appendix B: Twenty Years of Climate Action at the TDSB

From

Manon Gardner, Associate Director, School Operations & Service Excellence at manon.gardner@tdsb.on.ca or at 416-394-2041.

Steve Shaw, Executive Officer, Facilities at steve.shaw@tdsb.on.ca or at 416-393-8780.

Richard Christie, Senior Manager, Sustainability at richard.christie@tdsb.on.ca or at 416-396-8554.

Appendix A – TDSB Building Energy Intensity

The TDSB uses “energy use intensity” (total energy use/m²) to measure energy consumption in all buildings. In 2000, the TDSB’s total energy use intensity was 1015 MJ/m², and by the end of the 2018/2019 school year, it had dropped 25% to 764 MJ/m².

School Year	Natural Gas Consumption (M3)	Electricity Consumption (kWh)	Building Area (M2)	Portable Area (M2)	Electricity Energy Intensity (MJ/M2)	Gas Energy Intensity (MJ/M2)	Total Energy Intensity (MJ/M2)
2000-2001	78,501,852	368,754,633	4,177,267	46,055	315	700	1,015
2001-2002	79,347,623	347,661,265	4,174,073	46,055	297	708	1,006
2002-2003	75,231,043	333,316,665	4,233,533	46,961	281	662	943
2003-2004	76,051,686	309,601,970	4,229,424	36,928	262	670	932
2004-2005	76,000,254	315,032,747	4,213,636	36,231	268	672	939
2005-2006	72,635,507	303,814,556	4,196,812	36,092	259	645	904
2006-2007	69,270,181	299,533,789	4,206,067	35,813	255	613	868
2007-2008	68,548,051	296,663,356	4,235,630	42,641	250	603	853
2008-2009	65,852,488	290,813,317	4,231,916	42,571	246	580	825
2009-2010	67,593,837	282,849,303	4,161,666	42,084	243	605	848
2010-2011	66,163,829	281,796,769	4,170,770	39,924	242	591	833
2011-2012	66,705,319	273,167,297	4,105,259	39,784	238	605	843
2012-2013	64,964,893	274,323,820	4,057,150	39,575	242	596	838
2013-2014	63,032,907	278,871,809	4,024,011	41,178	248	583	831
2014-2015	61,651,153	277,037,698	4,044,328	40,760	245	568	813
2015-2016	62,280,023	278,439,387	4,098,254	40,899	243	566	809
2016-2017	62,156,463	270,817,529	4,096,801	41,248	236	565	801
2017-2018	58,539,826	278,024,588	4,100,135	30,183	243	532	775
2018-2019	57,174,690	275,691,319	4,082,288	30,183	242	522	764

Appendix B – Twenty Years of Climate Action at the TDSB

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Introduction

The TDSB has been engaged in climate action for 20 years. During this time, it has gradually reduced greenhouse gas emissions from buildings, spearheaded the EcoSchools movement spreading across Canada, and established numerous programs and partnerships to support and expand education for sustainability.

This report provides an overview of the actions that the TDSB has taken over the past two decades to tackle climate change and become more sustainable, both as an institution and as an educator.

The report is organized into four main sections:

- Part I looks at the TDSB's institutional context and initiatives that have supported climate action, including policies, targeted funding, consultation and youth engagement.
- Part II provides an overview of some of the key partnerships that support environmental action in schools.
- Part III addresses TDSB educational initiatives that support climate action, including EcoSchools, outdoor education, teacher education, and active, safe and sustainable transportation.
- Part IV addresses on-the-ground actions operations has taken related to school grounds, energy use in buildings, renewable energy, waste management and purchasing.

Part I – Context

Part I provides a summary of policy, funding, consultative approaches and youth engagement that the TDSB has adopted to shift towards sustainability.

Policy

The Board of Trustees has adopted policies and plans to provide strategic direction for environmental initiatives across operations and educational programs. The key policy achievements are summarized below:

TDSB Environmental Policy (2000/2010)

The TDSB has supported environmental education in different forms since the early 1990s, but the Board formalized its commitment to sustainability with the adoption of the TDSB Environmental Policy in 2000. This policy summarizes the TDSB's commitment to aligning environmental education and school operations in order to build whole-school, ecologically literate communities aimed towards a healthy, sustainable society. The policy was updated in 2010 to explicitly address climate change through mitigation, adaptation and climate change

education. The TDSB Environmental Policy continues to provide strategic direction for the Board for all sustainability and climate initiatives.

Charter for Active, Safe and Sustainable Transportation (2013)

In 2013, the Board of Trustees approved the Charter for Active, Safe and Sustainable Transportation (ASST) to tackle the decline in students walking and cycling to school. ASST has been incorporated into the EcoSchools program, and the Sustainability Office supports schools in implementing activities that encourage students to walk and cycle more. The TDSB's Environmental Legacy Fund has allocated funds to support the ASST program.

Funding

Targeted funding is required to implement policies. The TDSB has committed to funding environmental initiatives in several ways:

1. *By funding staff positions:* Several Sustainability Office positions, such as those that develop and support sustainability, school-ground greening initiatives and climate-action programs in schools, are funded directly by the Board. In addition, the office has three full-time staff dedicated to supporting the EcoSchools program; this commitment is vital to the success of the program and supports the teachers and students who volunteer their time to implement environmental actions at schools.
2. *By supporting outdoor education centres:* The TDSB operates nine outdoor education centres that immerse students in safe, active and enriching environmental learning experiences, in both natural and urban settings. The TDSB is one of the few school boards in Ontario directly operating its own outdoor education centres, and it does so to ensure that all TDSB students have access to outdoor education a minimum of three times through their elementary school career.
3. *Through the Environmental Legacy Fund (ELF):* In 2010, when the Board approved the *Go Green: Climate Change Action Plan*, it authorized the creation of an ELF. Income from the sale of carbon credits, electricity produced by solar photovoltaic (PV) projects and hazardous waste is directed into the fund, as are environmental grants. The fund is used to support high-impact projects related to active transportation, teacher professional learning, urban forest management, school-initiated projects, information technology and energy initiatives. The ELF has been critical to the success of many TDSB sustainability and climate actions.

Consultative approach

The TDSB has adopted a consultative approach around the issue of sustainability and climate action. This approach has been critical to engaging stakeholders, such as trustees, Board management, union representatives, teachers, parents, students and community partners. At present, two main platforms allow TDSB stakeholders to have a say in environmental policies, plans and projects being implemented at Board level:

1. *Environmental Sustainability Community Advisory Committee (ESCAC)*. ESCAC was established in 2010 as a direct result of the *Go Green: Climate Action Plan*, which called for a committee to provide advice and expertise to staff and trustees as they work towards meeting environmental goals. ESCAC is part of a network of TDSB community advisory committees. ESCAC provides a forum for community engagement around issues like climate change. Membership is open to trustees, Board staff, students, parents and community members.
2. *Joint Management-Labour Environmental Committee (JMLEC)*. The JMLEC was set up in January 2018 to leverage the knowledge that TDSB workers have of their workplaces and work processes and to link that expertise with the broader knowledge of management. The goal of the collaboration is to make informed decisions towards reducing greenhouse gas emissions by identifying feasible approaches and innovations to the workplace. The concept is designed to build organizational momentum in a framework of continuous improvement.

Youth Engagement

The TDSB offers several ways for students to have a voice in environmental plans and policies and to develop leadership skills. In the late 1990s, the TDSB set up the Student Environment Network (SEN), providing students with an opportunity to organize an annual conference. SEN eventually dissolved, but in 2013, the Toronto Youth Environmental Council (TYEC), a non-profit organization run by and for youth, emerged as a space for the youth of Toronto to push for change in the city's environmental policies. Many TYEC members are TDSB students who are also active leaders of environmental initiatives in their schools and communities, including the recent climate strikes. The TDSB's Student Senate (formerly known as the TDSB SuperCouncil) provides another forum for students to raise environmental concerns like climate change, and some TYEC members are involved in this group. The EcoSchools program provides many opportunities for students to gain leadership skills and express their ideas for sustainability and climate action projects to their schools.

Part II – Educational Partnerships

The TDSB has a well-established track record of working in collaboration with partners in the community to achieve the goals of climate action and greening schools. Long-standing partners such as Evergreen have been helping with school-ground greening efforts since 2004, and over the years, other key partners have stepped up to provide critical support to EcoSchools and to help schools plan and deliver educational programs that engage students in climate action. A few of the non-profits TDSB works with are:

No. 9

For the last few years, the TDSB has partnered with the non-profit organization No. 9, to deliver their program My Sustainable Community in TDSB schools. Students survey the land in their community and use principles of sustainable building to create a scale model of their ideal use of this land to enhance safety and sustainability.

Evergreen

Evergreen has been instrumental in supporting the school-ground greening program through a long-standing partnership that began in 2004. In addition to providing thousands of on-site design consultations for school-ground greening projects, Evergreen has helped develop several publications to guide school-based greening initiatives, including *Designing for Shade and Energy Conservation*.

FoodShare

FoodShare is an organization committed to making sure that everyone, especially those most affected by food insecurity, has access to affordable, fresh and healthy food. Their urban schoolyard farming project employs students to grow food on secondary school rooftops and lawns while promoting food literacy. FoodShare initially started working with three TDSB high schools to run school market gardens and has since expanded its reach. Burnhamthorpe CI has an impressive two-acre farm featuring a market garden, orchard, reforestation project, naturalized prairie gardens and a mid-scale community compost site. Eastdale CI has a half-acre rooftop garden that includes an education centre, market garden and event space.

Green Thumbs Growing Kids

This organization cultivates environmental stewardship through hands-on gardening and curriculum-linked food education for urban children and their communities. Several TDSB elementary schools are involved in Kids Growing, a program that connects children to their food, giving them the tools to grow, harvest and enjoy food right in the school garden.

PACT

In 2009, the TDSB formally partnered with PACT (Urban Peace Program) to implement the Grow-to-Learn gardening program in several TDSB schools. This program transforms “unused, often grey spaces into bountiful organic gardens where children and youth learn about harvesting food, sustainability and community building.”

CultureLink Settlement and Community Services

The TDSB has been partnering with CultureLink since 2015 to deliver cycling education support to schools. Through this partnership, the Sustainability Office is able to offer free cycling education programs to schools (e.g., bike rodeos, learn-to-ride workshops and bike safety workshops). CultureLink has also been a leading partner in Bike to School Week in Toronto for the last several years and has delivered a variety of cycling education supports to secondary schools.

Part III – Education as Catalyst for Climate Action

The TDSB has made environmental education a priority since the 1990s. This commitment has taken shape through several innovative programs, including outdoor education, EcoSchools and a new partnership for teacher education with OISE/UT. The TDSB’s track record as a Canadian leader in environmental education provides a solid foundation for climate change education and action in schools.

EcoSchools

The TDSB launched Canada's first EcoSchools program in 2003, a platform for environmental action and education. In 2005, the TDSB was instrumental in establishing Ontario EcoSchools, an independent province-wide program based on the TDSB EcoSchools model and resource materials. In 2019, Ontario EcoSchools expanded to become EcoSchools Canada, spreading the program pioneered by the TDSB to schools across the country. The scope of TDSB EcoSchools is very broad: It not only promotes environmental education and action, but also improves how schools and school grounds are used, run and even designed. The goal of the EcoSchools program is to support students and staff in learning about, caring for and protecting the environment — starting right in their own school.

All TDSB schools are invited to seek EcoSchools certification by implementing a range of environmental actions that focus on waste minimization, energy conservation, sustainable transportation and school-ground greening. The program also has a strong environmental literacy component, as well as special projects and events that may include parents and the wider community. Schools can certify at different levels: Bronze, Silver, Gold and Platinum, depending on the degree to which they embrace environmental action. The TDSB has certified elementary, middle, and secondary schools, and outdoor education centres in all parts of the city and in all kinds of neighbourhoods.

About 60% of all schools are certified, and each year, more are awarded Platinum, indicating that many schools are engaging with sustainability more deeply, including integrating climate change into teaching and learning.

Supporting EcoSchools

Adequate support is critical to the success of the EcoSchools program. Currently, a small team of TDSB staff is dedicated to supporting teachers and students, coordinating school-based greening projects, and managing the EcoSchools certification process, which involves conducting school audits. Each year, the EcoSchools team:

- Develops resource materials for EcoSchools (e.g., certification guides, handbooks, posters, curriculum materials and newsletters).
- Facilitates EcoSchools kick-off workshops to help teachers jump-start the program at their school, get updates on the program, and share ideas with Board partners and colleagues from other schools.
- Organizes student leadership conferences in the fall for students, drawing on existing best practices to help students develop leadership skills and tap their potential to help implement the EcoSchools program.
- Coaches schools applying for Platinum status and coordinates year-round tours of certified Platinum EcoSchools to share best practices and highlight certification requirements.
- Conducts school-ground greening consultations and programs.
- Coordinates with Board-approved partners who support environmental actions in schools, student leadership and professional development for teachers.

OISE/TDSB Collaboration

For many teachers, integrating environmental and climate change education into the curriculum is the most demanding expectation of the EcoSchools program. To support them, the TDSB has developed a strong partnership with the Ontario Institute for Studies in Education at the University of Toronto (OISE/UT) that offers teachers many opportunities for professional development in ecological literacy.

In 2013, the TDSB–OISE/UT partnership launched the Environmental Education Additional Qualification (EE AQ) course for teachers. Following the success of this first EE AQ, two new EE AQ courses (Part 2 and Part 3) were developed, as well as a certification program for educators who are not certified by the Ontario College of Teachers. These EE AQ courses employ diverse strategies (e.g., field trips, lectures, workshops and experiential learning) to help educators increase their capacity to implement environmental curriculum and foster student ecological literacy. As of August 2019, 166 TDSB teachers have completed EE AQ Part 1, 46 have also completed EE AQ Part 2 and 15 have completed EE AQ Part 3. TDSB staff who successfully complete a course are eligible for a subsidy funded from the TDSB's Environmental Legacy Fund.

Since EE AQ program has been established, the collaboration between the two institutions has expanded to include:

- The EcoSchools Action Research Professional Learning Community (PLC) for teachers to enhance knowledge of environmental education, cultivate new professional networks and develop capacity to mentor colleagues.
- The EcoSchools Program Evaluation, whereby teachers and administrators engage in collaborative inquiry to track the effects of environmental education work in their schools and communities, and share findings.
- An annual EcoSchools conference and eco-fair for teachers and teacher candidates.
- Environmental education workshops for teachers.
- Mentoring for OISE/UT teacher candidates by EcoSchools teachers in schools.

Outdoor Education

The TDSB currently operates nine outdoor education centres, of which five are overnight and four are day-use, serving about 65,000 TDSB students each year. Highly qualified staff members guide students and teachers through safe, active and enriching learning experiences in both natural and urban environments. Students learn through curriculum-enriching direct activities that cannot be duplicated within the walls of a classroom. Outdoor education centres provide an ideal space for learning about how climate change affects the natural environment and for thinking about strategies to mitigate and adapt. The TDSB's Outdoor Education website houses an archive of lessons that teachers can use back at school, many of which are directly related to climate change.

Active, Safe and Sustainable Transportation

The TDSB has made significant progress in promoting awareness and action around active transportation. In 2013, the TDSB's Board of Trustees approved a Charter for Active, Safe and Sustainable Transportation (ASST). Since then, the TDSB has supported a wide range of initiatives to encourage students and staff to walk or wheel to school, including cycling education programs and leadership camps, annual campaigns (e.g., International Walk to School Day, Bike to School Week), school travel planning, and participation in Metrolinx's Smart Commute program.

Secure bicycle parking for students and staff is key to active and sustainable transportation. Bicycle racks have been installed at over 134 TDSB schools since the ASST was launched in 2013. Recently, the TDSB has received \$350,000 funding from the City of Toronto to ramp up these efforts. The partnership with CultureLink and their Bike to School project has brought cycling education programs to numerous schools and helped students discover the personal and community benefits of cycling.

The TDSB has also been running a traffic safety program since 2017, thanks to a partnership with Green Communities Canada. This program targets schools experiencing the most traffic pressure. A program facilitator works with these schools to investigate traffic-related concerns; schools then establish a traffic safety team to work alongside the program facilitator to plan and implement solutions. The program also promotes active and sustainable transportation.

School-ground greening, including tree planting, food gardens and naturalized study areas, are another important part of education for climate action. These are covered in detail in Part IV, below.

Part IV – Operations

While education is at the heart of the TDSB, facilities and building operations play a major role in its climate action plan. The TDSB is a large organization comprised of schools, outdoor education centres and administration centres. All activities taking place within TDSB properties can play a role in mitigating and adapting to climate change, including school-ground maintenance, purchasing, transportation, energy and water use, and waste management. The Board's environmental policy (2010) recognizes that aligning operations with teaching and learning will help develop whole school, ecologically literate communities whose goal is building a healthy, sustainable society.

Greening School Grounds

School-ground greening plays a pivotal role in helping the TDSB to reduce its carbon footprint and adapt to climate change. Improving the quality of school grounds is an investment that increases in value over time.

TDSB school-ground greening initiatives began in the 1990s, for several reasons: natural spaces are ideal for environmental teaching and learning; they benefit biodiversity; they often provide shade and respite from urban heat islands; and they can be used to grow food.

Schools require guidance and support to plan, create and maintain greening projects, and the TDSB has developed several community partnerships over the past two decades (mentioned in Part II) to help provide this. Major school-ground greening initiatives are described below.

Urban forest management

The TDSB recognizes that the urban forest is vital to the health of our environment. The Large Tree Program was launched in 2007, and since then, approximately 2500 large native shade trees were planted at 250 TDSB schools. The total canopy on TDSB properties now includes about 35,000 trees, which absorb approximately 175 metric tonnes of CO₂ from the atmosphere each year. Trees have many other benefits: they make the grounds attractive, provide habitats for biodiversity, reduce storm water runoff, and shade buildings and play areas. Guided by its Urban Forest Management Plan (2013), the TDSB has committed significant resources to tree planting and tree maintenance, including a program to control the spread of the invasive Emerald Ash Borer, and watering and mulching programs throughout the summer months. The Urban Forest Management Plan also supported a University of Toronto [research project](#) on the effect of trees on the academic performance of primary students at the TDSB.

Nature study areas

In 2006, the TDSB initiated a program encouraging schools to develop nature study areas (NSAs) on the school grounds. These designated areas naturalize when they are no longer mowed, which can reduce maintenance costs, noise and air pollution. Each NSA is unique to the environmental conditions in that particular schoolyard. NSAs are an important component of the EcoSchools program as they allow teachers and students to access the enhanced biodiversity that naturalized areas can provide for learning right in the schoolyard. In 2016, the TDSB developed a guide to help schools plan, create, maintain and use their NSAs. Currently, about 18 schools have NSAs.

Food gardens

Many TDSB schools have food gardens, which not only provide places for students to learn how to grow, harvest and prepare food, but also teach them about food security and nutrition. Many of these gardens are made possible thanks to partnerships with a number of community groups including FoodShare, Green Thumbs Growing Kids and PACT (please see Part II for more information on these partnerships).

Energy Management

Since the 1990s, the TDSB has worked steadily to reduce energy consumption in buildings, the largest source of its greenhouse gas emissions. The TDSB uses “energy use intensity” (total energy use/m²) to measure energy consumption in all buildings. In 2000, the TDSB’s total energy use intensity was 1015 MJ/m², and by the end of the 2018/2019 school year, it had dropped 25% to 764 MJ/m².

In 2019, the TDSB published its [Energy Conservation and Demand Management Plan](#), which documents some of the work done to reduce energy consumption across the TDSB in a five-year reporting period from the 2013/2014 to 2017/2018 school years. According to this report, overall energy use at TDSB buildings dropped, mainly as a result of upgrades to heating and

hot water systems in schools, which significantly reduced the TDSB's use of natural gas. In this five-year period alone, CO₂ emissions were reduced by about 142,000 metric tonnes.

The key actions that reduced energy use are summarized below. Further detail can be retrieved from the plan.

Heating and Cooling System Renewal

Upgrades to outdated school heating systems and building retrofits have provided the greatest energy savings and reduction in emissions. The TDSB operates close to 600 building heating systems of varying models, the majority of which are past their life expectancy and in need of replacement at the time of the report. The TDSB has been engaged in a sustained effort to renew these building heating systems, including replacing older-model steam plants with new hot-water-based ones that are more efficient and require less maintenance. All of the new heating systems allow for more precise temperature scheduling based on outdoor weather and building occupancy. The new heating plants also have a built-in Building Automation System (BAS) that monitors temperatures, allowing for greater energy efficiency and control. Many water heating systems were upgraded to be more efficient as well. In total, 75 heating plants were replaced between the 2013/2014 and 2017/2018 school years, reducing total emissions by more than 71,000 tonnes of CO₂.

Starting in the late 1970s, central cooling plants were included in the design for larger schools, and many of these have now exceeded their life expectancy and are being replaced with more efficient chiller plants that use less energy and are electronically controlled. Some schools have also had new, more efficient central ventilation systems installed with enhanced BAS controls, further reducing energy consumption. A total of 19 cooling/HVAC renewal projects were implemented during the reporting period, helping to avoid almost 1000 tonnes of CO₂ emissions.

School Roofing Renovations

Extensive work has been done to upgrade and repair aging school roofs, and all of these projects have included improved roof insulation, generating significant savings in heating costs. Approximately 6 million square feet of roofing has been upgraded since the roof repair project started, avoiding some 63,000 tonnes of CO₂ emissions.

Window Upgrades

Many of the TDSB's older buildings have aging single-glazed windows, with cracked seals and wood frames, all of which contribute significantly to energy loss. As part of the TDSB renewal efforts, the Board began the work of replacing older windows with newer, more energy efficient models, focusing first on high priority, larger jobs. So far over 15 million square feet of windows have been replaced, averting almost 6000 tonnes of CO₂.

Renewable Energy

The TDSB began investing in renewable energy technologies in 2010, with a particular focus on the installation of solar PV systems on school rooftops. The first systems were installed by the TDSB on 10 schools. The TDSB has a contract to sell this electricity to the Independent Electricity System Operator, projected to earn a total of about \$3.4 million for the Environmental Legacy Fund over the duration of the 20-year contract.

Since those first installations, a further 311 TDSB schools have had solar PV systems installed on their rooftops, thanks to an agreement with School Top Solar Limited (now Potentia Renewable Inc.). In exchange for roof space on TDSB schools to install their solar arrays, the company is covering the costs of millions of square feet of roofing. Overall, the program saw the installation of close to 148,000 solar panels with an installed capacity of 37 megawatts (MW). These solar arrays on TDSB schools offset over 30,000 tonnes of CO₂ between the 2013/14 and 2017/18 school year.

Waste Management

Every item the TDSB purchases, transports and throws away has an environmental impact, including greenhouse gas emissions. By minimizing the amount of waste going to landfill, the TDSB can significantly reduce this impact. TDSB properties participate in the City of Toronto waste minimization programs such as recycling and green bins, but the TDSB has also initiated several of its own programs to minimize the amount of waste going to landfill. Highlights of TDSB waste management include the following:

- In 2009, the TDSB reduced the frequency of waste collection from twice a week to once a week at many schools, lowering costs as well as greenhouse gas emissions associated with vehicle trips.
- EcoSchools produce about half as much waste per year compared to non-certified schools. This is a direct result of focused waste minimization programs, which are largely implemented and led by student volunteers.
- In 2015, the TDSB launched Project Refill, which encourages schools to use fewer single-use plastic water bottles by installing water bottle filling stations. This initiative promotes a culture of waste minimization in schools. Through this program, 134 water bottle filling stations have been installed. An additional 282 water bottle filling stations have been installed outside of this program.
- The TDSB's ArtsJunktion is a depot for receiving and distributing materials and supplies donated by community partners, which are then used in educational and creative programs within the TDSB. ArtsJunktion has been running for over 35 years and is currently operating under the Sustainability Office.

Purchasing

While sustainable procurement practices are not yet mainstreamed at the TDSB, some significant advances have been made, including the following:

- In 2018, the TDSB implemented an online bids and tenders digital procurement platform, saving approximately 200 metric tonnes of CO₂ associated with paper and printing costs.
- Schools and offices now have the option to purchase 100% post-consumer recycled paper.
- Staff recently drafted a detailed report outlining options for discontinuing the distribution of single-use plastic items (SUPs). The report highlights the impact of SUPs on the environment and human health, their use within the TDSB, and strategies for alternatives.

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