Toronto District School Board

Operational Procedure PR603

Title: **GO GREEN: CLIMATE CHANGE ACTION PLAN**

Adopted: February 3, 2010
Revised:
Reviewed: April 2012
Authorization: Executive Council

1.0 OBJECTIVE

To provide an action plan to the Board's commitment to the focus areas for sustaining the environment: mitigation, adaptation, and education as stated in policy P028, The Environment

2.0 RESPONSIBILITY

Chief Facilities Officer

3.0 DEFINITION

The Action Plan was developed in response to the revised Environment Policy (February 2010) with its explicit emphasis on climate change. It lays out 10 actions in 3 categories ranging from long-term planning and investment strategies to immediate actions and recommendations for organizational change. Actions in the near term include installation of solar PV systems on school roofs, developing school grounds' potential as community energy hubs and market gardens, and signing an agreement to trade the Board's carbon emissions whose income would be used for an Environmental Legacy Fund. Organizational changes include the establishment of a community Environmental Advisory Committee and the publication of an annual Environmental Sustainability Report.

4.0 THE ACTION PLAN

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4.1. General

Over the last ten years, the Toronto District School Board has made great achievements in addressing environmental concerns, with innovative and effective actions to improve energy conservation, waste minimization, school ground greening, and ecological literacy. A detailed list is provided in Appendix B. Now, in the face of the global climate change crisis, the Board has deepened its environmental commitment in the three focus areas for sustaining the environment: mitigation, adaptation, and education (see Board policy P028, The Environment).

4.2. Background

Climate change is one of the greatest challenges of the 21st century—one that needs to be addressed by all sectors of society, and particularly by school boards, because our students will be the future leaders in building an environmentally sustainable future. The Board's EcoSchools program, now in its seventh year, has laid the groundwork within schools and across many departments to tackle this challenge from a uniquely educational point of view. The Board is at a point where it needs to name climate change as a

To read more about climate change as a long-term and deepening crisis, including the latest scientific findings and Canada's record on greenhouse gas (GHG) reductions, see Appendix A.

central focus through an addition to its environment policy (see section 5, Reference Documents).

With the revised policy as its foundation, the Go Green: Climate Change Action Plan responds to climate change by focusing its planning and decision-making on mitigation, adaptation, and education.

The Board needs to help to *mitigate* climate change by adopting the federal government's target of a 20% reduction in greenhouse gas (GHG) emissions by 2020 on the way towards an 80% reduction by 2050. The Board needs to establish a clear direction for the plan needed to achieve these targets.

To learn more about the Board's environmental progress over the past decade and current project initiatives, see Appendix B: the Board's Environmental Progress: Building on Our Achievements, and Appendix F: Renewable Energy Projects Submitted for Provincial Funding, 2009.

Second, the Board needs to *adapt* to the rising temperatures that are inevitable even with aggressive reductions in GHG emissions, by increasing tree planting and partnering with local organizations to pilot more ambitious food and market gardens at selected sites, building on the Board's significant school ground greening expertise.

Third, as knowledge and experience of climate change deepens, the Board needs to continue to *educate*—a step that has always been at the very heart of its mission. In the terms used in the Ministry of Education's definition of environmental education, the Board must educate "in, about, and for" a climate-changed world. EcoSchools has taken the lead in providing students with opportunities to put their learning into action by making their schools more sustainable places for the whole school community.

4.3. Three Categories for Actions

Visible and ongoing high-level leadership will guide the Board's response to climate change. Adding specific mention in the Environment Policy of climate change as one of the greatest challenges of the 21st century signals the Board's strong commitment and aligns with the Director's *Vision of Hope* (October 2009).

The Plan's actions are organized into three categories: Planning for the Long Term, Quick-Starts, and Organizational Change.

(a) *Planning for the Long Term*: An investment in long-range planning is essential to achieving results over the medium and long term through the strategic investment of resources.

(b) *Quick Starts*: Undertaking quick-starts where possible while simultaneously planning for the long term will be important. The Board cannot ask its school communities and neighbourhoods to be content to wait for the results of long-term planning to appear. They want action now.

The *Go Green: Climate Change Action Plan* is closely aligned with the Ministry of Education's new environmental education policy framework, *Acting Today, Shaping Tomorrow* and fulfills the Board's three priorities of Student Achievement, Parent and Community Engagement, and Financial Stability.

(c) *Organizational Change*: Significant organizational changes will be necessary to support a major effort to address climate change across the Toronto District School Board.

The following table summarizes the plan's key actions. More detailed information on each of the actions appears in the pages that follow.

4.4. Actions

Category: Planning for the Long Term

Action 1, Develop Strategic Energy Plan for Building-related GHG Emissions

(a) Develop a strategic energy plan consisting of:

- a detailed technical energy plan to reduce building-related GHG emissions by a minimum of 20% by 2020 (relative to a 2006 baseline).

Timeline: Issue a Request for Proposals in February 2010; complete plan by October 2010

Funding required: Approximately $125,000

Funding source: Existing provincial grant

(See Action 1A)

- School Energy Plans: Refocus energy management resources to better support the efforts of students, school staff, and parents/guardians

Timeline: Issue a Request for Proposals in December 2010; completed by April 2011

Funding required: Approximately $25,000

Funding source: Existing provincial grant

(See Action 1B)

- a funding plan to facilitate the implementation of the technical plan

Timeline: Start September 2010; completed by December 2010

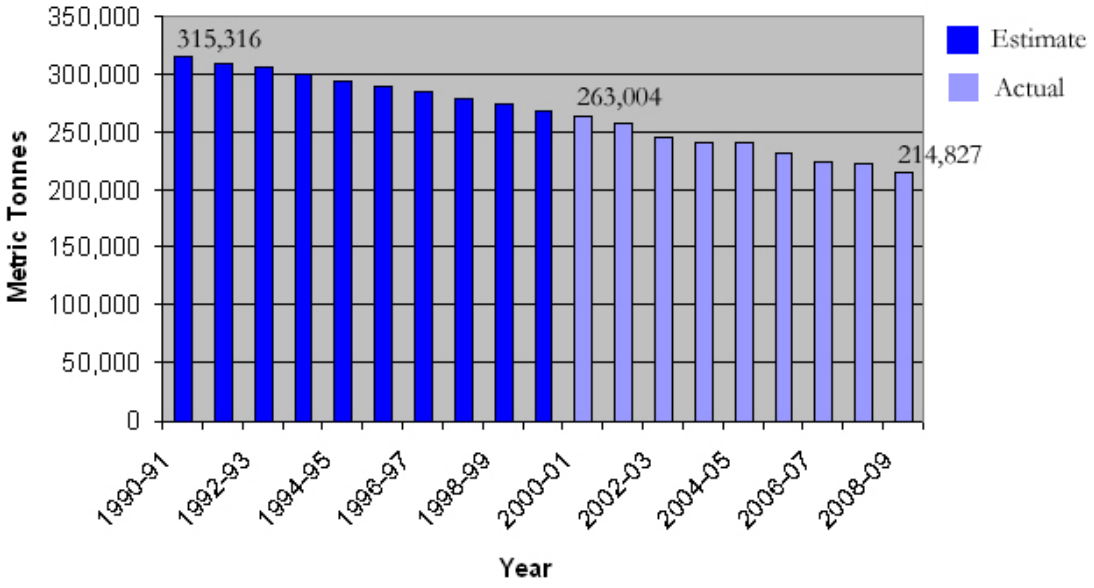
Funding required: No cost to the Board

(See Action 1C)

(b) Results to Date

The Board's building-related GHG emissions have been reduced by 18% since 2000–01. Since 1990, the Board *estimates* that its building-related GHG emissions have decreased by 32%. (Note that energy consumption data predating amalgamation is incomplete. The Board has very high quality data from 2000–01 onward.)

Figure 1: The Board's building-related GHG emissions, 1990/91 to 2008/09

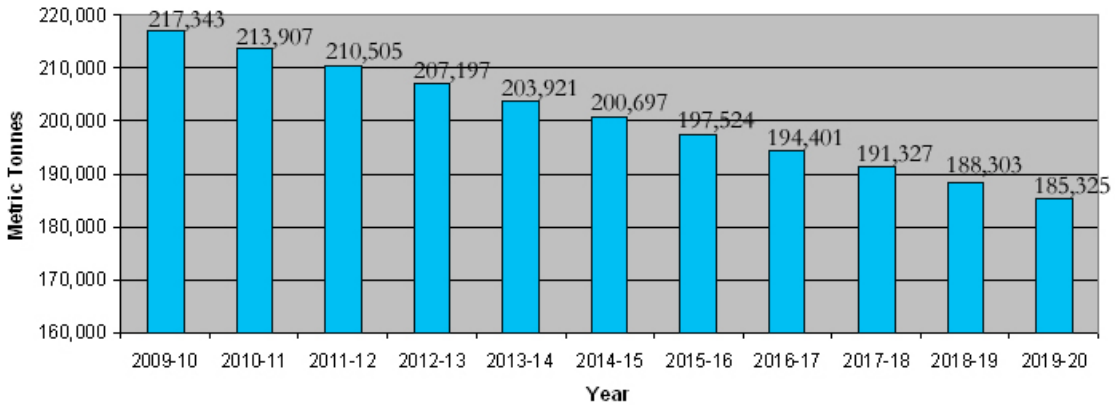


(c) Targets

More of the Board's GHGs come from building-related sources than any other areas: this is where the greatest impact through concerted reduction efforts can occur. The time is right to build upon the Board's considerable accomplishments to date by developing a comprehensive energy plan to further reduce energy consumption in buildings by 20% by 2020 (relative to a 2006 baseline) that would set the Board on a course for reducing its emissions by 80% by 2050. [1]

[1] The Government of Canada has committed to a 20% reduction in GHG emissions by 2020 relative to a 2006 baseline. Critics argue that Canada should be using the 1990 baseline established under the Kyoto protocol. Canada's emissions are currently 26.2% above 1990 (the worst record among advanced industrialized countries). In contrast to the country as a whole, the Board's current GHG emissions are estimated to be 32% below 1990 levels.

Figure 2: Targets needed to achieve a 20% reduction in building-related GHG emissions by 2019/20 (relative to 2005/06)



Note that the Board is currently ahead of schedule in terms of meeting the targets to bring about a 20% reduction in GHG emissions by 2020.

(d) Scope of the Work

There are three major components in developing the strategic energy plan. The first component involves developing a detailed plan of the technical measures needed to reduce the Board's consumption by 20% by 2020. The second component focuses on the issue of how the work will be done. In particular, the Board would like to refocus energy management resources to better support the efforts of students, school staff, and parents/guardians. The third component is the development of a funding plan to facilitate the implementation of the technical plan.

The first two components of the Plan will be developed through a broad consultative process that involves not just experts in energy management including the Board's central staff, but also school staff, students, and parents/guardians.

Action 1A, Develop a detailed technical plan

The Board will issue a Request for Proposals to select consulting services to develop a detailed technical plan to reduce emissions by 20% by 2020. The Board will invite interest from highly innovative teams led by a primary consultant and supported by secondary consultants who bring a diversity of expertise and experience to the project.

The team should also include members with expertise in managing complex organizational transformation and who have a deep understanding of the Board's Facility Services department, including its work processes and culture.

The Board expects the proponents to work in close collaboration with the Facility Services Quality Group, who will establish a cross-functional project team to help implement significant components of the strategic energy plan. The cross-functional team will include representatives from schools and other central departments as well as Facility Services.

Three major steps define this task. A team of consultants should be hired through a Request for Proposals process.

Step 1: Verify the Board's building-related GHG emissions

Step 2: Establish detailed GHG reduction targets

> The consultative team will help the Board assess the potential for savings from energy conservation building improvements and proven renewable energy technologies as part of establishing targets for each emissions source in order to reach the target of a 20% reduction by 2020. Achieving this goal will be contingent on the results of the technical study and the funding available.

Step 3: Use the targets to build a detailed 10-year action plan

> Once specific targets for all sources of significant GHG emissions are established, a more detailed plan can be developed.

For further details about Action 1A, the detailed technical plan—its development and the expected deliverables (see Appendix C).

Action 1B, School Energy Plan: Reorient energy management resources to better support the efforts of students, school staff, and parents/guardians

The Board will issue a second Request for Proposals (RFP) to select consulting services to help it reorient energy management to better support the efforts of local schools. The Board will invite interest from highly innovative proponents who bring a diversity of expertise and experience to the project.

The proponents will demonstrate expertise in all of the areas outlined in the first RFP. However, there will be a special emphasis placed on the experience and expertise of proponents in facilitating exemplary consultation sessions at the local school level.

For further details about Action 1B, please see Appendix D.

Action 1C, A funding plan to facilitate the implementation of the technical plan

Board staff needs to develop an explicit and detailed funding plan to outline exactly how to implement the detailed technical plan and the school energy plans.

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Action 2, Develop Strategic Energy Plan for Non-building-related GHG Emissions

(a) Develop a separate strategic plan to quantify and then reduce all other non-building-related GHG emissions (e.g., waste management, procurement of goods) by at least 20% by 2020.

Timeline: Start in September 2012; completed by February 2013

Funding required: $50,000

Funding source: Existing provincial grant

(b) Prepare a funding plan to facilitate the implementation of the strategic plan.

Timeline: Start November 2012; completed by March 2013

Funding required: No cost to the Board.

The complexity of building a comprehensive, long-term energy plan requires external funding for expert help to guide this work. Relative lack of good data makes it necessary to separate this multi-faceted analysis from that of building-related GHGs.

Three major steps define this task. A team of consultants should be hired through a Request for Proposals process.

Step 1: Quantify the Board's Non-building GHG emissions

The full extent of the Board's non-building related greenhouse gas emissions is not known. To quantify them, the Board needs to identify what to include (and exclude) in the baseline, and then gather the relevant data. Activities such as waste management and procurement (e.g., copy paper) will be examined.

Step 2: Establish detailed GHG reduction targets

Once a clearer understanding has been established about where the Board's total emissions are coming from (Step 1), the reductions needed in each area can be quantified in order to reduce the Board's overall emissions by 20% by 2020 on the way towards an 80% reduction by 2050. Achieving this goal will be contingent on the results of the technical study and the funding available.

Step 3: Use the targets to build a detailed 10-year action plan

Once more detailed targets for all the activities that are emitting significant GHG emissions are established, a more detailed plan can be developed.

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Action 3, Reduce the Board's Fleet of Vehicle's Emissions

(a) Develop a strategy to quantify and systematically reduce GHG emissions from the Board's fleet of vehicles by participating in (i) the Toronto Atmospheric Fund's Electric Vehicle (EV)-300 initiative, and (ii) the Fleet Challenge Ontario's (FCO) national certification program.

Timeline: (i) EV-300 is expected to start in January 2010 with the goal of purchasing vehicles by 2012; ii) initial review of the Board's fleet will be completed by October 2010

Funding required: (i) $10,000; (ii) approximately $3000 for the initial FCO review

Funding source: Existing provincial grant

b) Prepare funding plans to facilitate the implementation actions arising (i) EV-300 initiative and (ii) the Fleet Challenge Ontario's national certification program.

Timeline: (i) Start January 2012; complete by May 2012; (ii) Start October 2010; complete by December 2010.

Funding required: No cost to the Board.

(i) The Toronto Atmospheric Fund is an arms-length agency of the City of Toronto. The Electric Vehicle (EV)-300 initiative will bring together the fleet managers of public and private sector fleets to work collaboratively to procure, maintain, and monitor the performance of electric vehicles. The goal of the program is to facilitate the purchase and operation of at least 300 electric vehicles by 2012 and to work with local distribution companies (such as Toronto Hydro) and municipalities to help establish charging infrastructure in the GTA. Each organization retains the right to decide if it will purchase electric vehicles. Participating in the program will allow the Board to move towards the purchase of electric vehicles without the risks of a "go-it-alone" approach.

The $10,000 contribution to the program will help support the convening, procurement, research, and communication functions of EV-300.

(ii) Fleet Challenge Ontario (FCO) is a not-for-profit program that helps fleet operators reduce their fuel consumption, operating costs, and GHG emissions through the sharing of modern fleet management techniques and best management practices. FCO administers a national certification program. Participating organizations pay an initial $3000 fee to have their fleets analyzed. The summary report not only quantifies GHG emissions, but also provides detailed recommendations for reducing emissions and operating costs. Once actions are taken to improve performance, there is an additional fee of approximately $2000 to have one's fleet reviewed by a third-party auditor to verify improvement.

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Category: Quick Starts

Action 4, Install Solar PV Systems

Design and install solar photovoltaic (PV) systems on 20 schools per year, subject to availability of funding from the feed-in-tariff (FIT) program or other external sources.

Any surplus revenue generated through the FIT program by projects fully funded by grants will be directed into a new Environmental Legacy Fund Reserve annually for a period of 20 years.[2] Consulting, legal and related costs associated with the Actions in this report (for which a funding source has not been identified) will be drawn from this Fund Reserve. How the remainder of the Fund Reserve is to be used will be decided through consultation, and subject to Board approval. For more on the Fund Reserve, please see Action 8.

Timeline: An initial group of 30 projects begun in September 2010 is to be completed by August 2011; 20 more schools to be completed by August 2012

Funding required: Approximately $11,000 per kilowatt

Funding source: The first group of projects will be paid through provincial grants. Future projects will be paid through the sale of the electricity generated to the Ontario Power Authority for a premium,[3] which will allow the Board to pay back upfront capital costs within an 11-year period.

Recently, the Ontario government has significantly increased the incentives for boards to install renewable energy systems on their schools:

(i) The Ministry made $50 million available provincially for school renewable energy projects. The Board was allocated 30 projects (business cases/sites). Thirty schools were selected for a variety of projects (see Appendix E**)** using non-technical criteria (including EcoSchools certification, geographical distribution, and a range of LOI rankings) and technical criteria (such roof structure and condition, the quality of the solar exposure, and the degree of difficulty in connecting proposed technologies to existing building systems).

(ii) The Ontario government's Green Energy Act has significantly increased the premiums paid for the generation of green electricity in the province through its feed-in-tariff (FIT) program. The premiums paid through the FIT program mean that upfront capital costs can be paid back within 11 years and then pro-

[2] Where upfront capital costs have been borrowed, surplus revenue from projects will be directed to the fund after all costs have been paid (approximately 11 years).
[3] Premiums are scaled according to the size of the project and its location. Small rooftop systems (10 kW or less) earn $0.802/kWh. Rooftop systems larger than 10 kW but smaller than 250 kW earn $0.713 per kWh. Rooftop systems larger than 250 kW but smaller than 500 kW earn $0.635 per kWh. Very large rooftop systems (larger and 500 kW) earn $0.539 per kWh. Ground-mounted systems earn $0.443 per kWh.

vide additional income to the Board for the duration of the 20-year contract that it would sign with the Ontario Power Authority.

(iii) It is understood within the industry that the current state of the FIT program is time limited and subject to change over time. The Board's annual renewable energy programs will be planned in conjunction with a review of available funding sources to ensure satisfactory returns on investment.

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Action 5, Collaborate in the City of Toronto's Tower Renewal Pilot Initiative

Work collaboratively with the City of Toronto to develop a community energy plan that links the Mayor's Tower Renewal initiative with local schools.

Timeline: A design charrette to develop a community energy plan took place in November 2009. Report will be completed by February 2010.

Funding required: No cost to the Board. The cost of developing the plan is being paid by the City of Toronto.

The City of Toronto has the goal of achieving a state of energy sustainability (http://www.toronto.ca/changeisintheair/index.htm). The Mayor's Tower Renewal is a program to drive broad environmental, social, economic, and cultural change by improving Toronto's concrete apartment towers and the neighbourhoods that surround them. (www.towerrenewal.ca). The program is currently focused on four pilot sites.[4]

The Board recently partnered with the City of Toronto on a design charrette in one of the pilot areas to explore how local schools could contribute to a broader, community-based approach to significantly reducing GHG emissions. For example, the charrette explored the feasibility of locating a district heating and cooling system underneath the grounds of a school that would supply energy to local apartment buildings and other energy consumers in the local community.

The City of Toronto has included the cost of the design charrette within the broad scope of work that is already being undertaken as part of the Mayor's Tower Renewal initiative.

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[4] The four sites: West—2667 and 2677 Kipling Ave; East—215 Markham Rd.; South—200 Wellesley St. E./275 Bleecker St.; North—175 Shaughnessy Blvd.

Action 6, Develop School Grounds

Action 6A, Develop School Grounds as Community Energy Hubs

Develop school grounds as community energy hubs.

Timeline: A Request for Proposals is in process to select a consultant. A contract award recommendation will be presented to Board in February 2010. The consulting team will then undertake a feasibility study at Ryerson Community School for completion by June 2010.

Funding required: If the project goes ahead, the total $175,000 cost of the study will be included in the overall project cost. If the project does not proceed, only the Phase One study cost of $45,000 will be paid by the Board.

As pressure mounts for Canada to significantly reduce its greenhouse gas emissions, there will be increasing attention paid to establishing large geothermal systems that would supply clean power to multiple buildings within communities throughout the city. These systems are often referred to as "district heating and cooling systems." School grounds are ideal sites to establish geothermal systems because of their size and their distribution across all communities in the city. Once systems are installed they are completely hidden and therefore do not interfere with the use of the grounds in any way. In addition to supplying clean green power, large district geothermal systems established underneath school grounds offer the potential of establishing a new long-term funding source for the Board.

Action 6B, Develop School Ground Market Gardens

Develop school grounds as locations for piloting more ambitious food and market gardens at selected schools, building on the Board's significant school ground greening expertise.

Timeline: Ongoing

Funding source: No cost to the Board

Through its long-standing partnership with Evergreen, the Board provides significant support to schools undertaking school ground greening projects of all kinds, including the establishment of school gardens. More recently, the Board has begun working more closely with two other charitable organizations (Foodshare and the Youth Crime Prevention Program PACT) to help schools establish and support larger market gardens on school grounds.

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Action 7, Fund School-based Environmental Initiatives Through Garbage Pick-up Savings

Develop a plan to switch schools and offices to once-a-week garbage pick-up (or equivalent) to fund: (a) the hiring of four additional seasonal grounds staff dedicated to directly supporting schools in a major tree planting and maintenance program, and (b) the implementation of a new program to fund school-based environmental initiatives at the Family of Schools level.

Timeline: The plan will be completed by March 2010. Changes will take place effective September 2010

Funding required: The cost of four additional seasonal grounds staff is approximately $250,000. The amount of money in the school-based environmental fund will be set according to how much money is saved through once-a-week pick-up (less the $250,000 for the grounds staff).

Funding source: Operational savings achieved by reducing the frequency of garbage pick-up. The Board's goal is to save at least $500,000 by switching to once-a-week garbage pick-up. Any savings from reduction in frequency of pick-ups, conversion of bulk garbage bins to bulk recycling bins, and reduction in size and/or number of garbage bins achieved from January 2009 are to be segregated and set aside to fund these two initiatives.[5]

The Board spends about $1.6 million a year on waste removal and disposal. Until recently, almost all schools and offices have had garbage pick-up twice a week. Last year, 107 schools voluntarily heeded the call to switch to once-a-week garbage pick-up, thereby saving the Board approximately $155,000 annually.

Right now, the Board is paying a lot of money to "empty air" because most bulk garbage bins are not full when they are picked up. It costs the same amount of money to empty a full bin as it does a half-full bin.

Bulk garbage bins are not full primarily because of the hard work over the years that schools put into recycling and other efforts to minimize waste. Requiring all schools to switch to once-a-week pick (or the equivalent) will provide the Board with an opportunity to reap a significant "recycling dividend."

To help schools deal with the transition to once-a-week pick-up, the Board would allow schools to request four additional garbage pick-ups that could be used at any time during the year. While this would make more work for the central staff arranging for the extra pick-ups, the overall savings would justify the extra effort.

[5] Note: Staff will identify and redirect savings already achieved between January and August 2009 to this initiative for 2010/11 fiscal year.

Switching to once-a-week garbage pick-up, along with conversion of bulk garbage bins to bulk recycling bins, and reduction in size and/or number of garbage bins, could save at least $500,000 a year, which is enough to pay for two new initiatives. The following initiatives are suggested.

(a) Hire four additional seasonal grounds staff dedicated to supporting schools with a major new large-tree planting and maintenance program.

There is a need to maintain the existing trees on school grounds (estimated to have a financial value of about $90 million) and to increase the number of trees, particularly in areas of active play, to provide shade for students.

In the last three years, the City of Toronto has donated a total of 630 trees, which have been planted by Facility Services at 90 schools. The City is willing to supply more trees if the Board can demonstrate the capacity to plant and maintain them over time. With current staff levels, the existing program cannot be expanded. With four additional seasonal workers, the Board's large-tree planting program could be expanded significantly. In addition to planting 500 to 600 large trees a year, the four seasonal workers would ensure that all new trees are properly caged, mulched, watered, and pruned. They would also devote significant time and effort to supporting schools in maintaining their existing trees. The Board's existing urban forest needs to be properly maintained and significantly expanded.

The workers should be in place for the 2010/11 school year. The estimated cost of the four seasonal workers is $250,000 a year.

(b) Create a new school-based Environmental Projects Fund to support environmental initiatives, to be allocated at the Family of Schools level.

Certified EcoSchools put a great deal of effort into their environmental initiatives. Even though the Board has been supporting its EcoSchools in many different ways, there is merit in also providing more direct funding for schools undertaking environmental initiatives. The suggestion is that Families of Schools would receive annual funding. Each FOS could then decide how the funding would be allocated among the schools in its family. The central EcoSchools team would establish an application process (along with criteria) that Families could elect to use to guide their decision-making. Half of the projected savings achieved by switching to once-a-week garbage pick-up would be directed to schools at the local level to support their environmental efforts. Appendix F responds to recommendations in the New Fiscal Directions report about sharing savings with schools.

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Action 8, Sign Agreement to Trade Carbon Emission Credits

Sign an agreement to trade TDSB carbon emission credits through the Greening Canada Fund.

The net revenue from the sale of credits will be directed to a new Environmental Legacy Fund Reserve (as outlined above in Action 4). Consulting, legal and related costs associated with the Actions in this report (for which a funding source has not been identified) will be drawn from this Fund Reserve. How the remainder of the Fund Reserve is to be used will be decided through consultation, and subject to Board approval.

Timeline: Following recommendation to Board in January 2010

Funding required: $30,000 in consulting fees which would be paid for through the sale of the credits.

Cashing in the Board's Carbon Credits

A draft federal framework for trading carbon credits has been announced that would establish a mandatory system, effective in January 2011. Until that date, emission reductions can be traded on a voluntary basis through the Greening Canada Fund (GCF).

Green Power Action is the fund manager for the Greening Canada Fund, whose investors, having committed to carbon neutrality, need carbon credits to meet their public commitments to their customers and other stakeholders. The Board's energy conservation and efficiency programs have been accumulating those carbon credits: they are a significant source of funds.

The quantity of the Board's emission reductions suitable for trade as voluntary carbon credits (2001–2009) is estimated to be 200,000 tonnes. This quantity, subject to validation by a third party, could be traded through Greening Canada Fund.

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Category: Organizational Change

Action 9, Establish an Environmental Sustainability Community Advisory Committee

Establish a community advisory committee on Environmental Sustainability as set out in policy P023, Parent and Community Involvement.

Timeline: Begin to organize upon approval by the Board of Trustees

Funding: No cost to the Board

The Board should appoint trustee members, including one trustee who will co-chair with a parent/guardian or community member as selected by the committee. The Director will

designate staff as non-voting resource persons. This inclusive multi-stakeholder committee will provide advice and expertise, and act as a resource to both senior staff and the Board of Trustees through the Board's standing committees as it works towards meeting its commitments. This action has been referred to the Planning and Priorities committee for approval.

The first task of the new Environmental Sustainability CAC should be to provide input into the development of the strategic energy plan to reduce GHG emissions for the Board.

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Action 10, Publish an Annual Environmental Sustainability Report

Publish an annual Environmental Sustainability Report.

Timeline: First report completed by September 2011

Funding: No cost to the Board

The report should summarize for the Board and the public the year's work, progress, and challenges in meeting its GHG reduction commitment. The report would help senior staff and the Board of Trustees manage and improve environmental performance across departments, identify key priorities and opportunities for action, strengthen management systems, and provide information to interested staff, students, and the public.

The report should:

- highlight projects and initiatives
- explain whether previous commitments have either been "achieved," "not achieved," or if "acceptable progress" has been made
- summarize strengths, areas for improvement, and next steps, and summarize all relevant data in clear terms
- be subject to third-party verification to ensure a very high level of transparency

In the annual preparation of the Environmental Sustainability Report, staff should work closely with the Community Advisory Committee on Environmental Sustainability (see Action 9), particularly for outlining the Board's next steps.

4.5. Summary of Actions

Planning for the Long Term

Action 1	Develop a strategic energy plan consisting of: a) A detailed technical plan to reduce building-related GHG emissions by a minimum of 20% by 2020 (relative to a 2006 baseline) b) School Energy Plans: Reorient energy management to better support the efforts of students, school staff, and parents/guardians c) A funding plan to facilitate the implementation of the technical plan
Action 2	a) Develop a separate strategic plan to quantify and then reduce all other non-building-related GHG emissions by at least 20% by 2020; b) Prepare a funding plan to facilitate the implementation of the strategic plan.
Action 3	Develop a strategy to quantify and systematically reduce GHG emissions from the Board's fleet of vehicles by participating in (i) the Toronto Atmospheric Fund's Electric Vehicle (EV)-300 initiative, and (ii) the Fleet Challenge Ontario's national certification program. Prepare funding plans to facilitate the implementation actions arising (i) EV-300 initiative and (ii) the Fleet Challenge Ontario's national certification program.

Quick Starts

Action 4	Design and install solar photovoltaic (PV) systems on 20 schools per year, subject to availability of funding from the feed-in-tariff (FIT) program or other external sources. Direct surplus revenue arising from projects to a new Environmental Legacy Fund Reserve.
Action 5	Work collaboratively with the City of Toronto to develop a community energy plan that links the Mayor's Tower Renewal initiative with local schools.
Action 6	Develop school grounds as (a) community energy hubs, and (b) locations for piloting more ambitious food and market gardens at selected schools, building on the Board's significant school ground greening expertise.
Action 7	Develop a plan to switch all schools and offices to once-a-week garbage pick-up (or equivalent) to fund: (a) the hiring of four additional seasonal grounds staff dedicated to supporting schools in a major tree planting and maintenance program, and (b) the implementation of a new program to fund school-based environmental initiatives to be al-

located at the Family of Schools level.

Action 8 Sign an agreement to trade the Board's carbon emission credits through the Green Canada Action Fund. Direct the net revenue from the sale of credits to a new Environmental Legacy Fund Reserve.

Organizational Change

Action 9 Establish a Community Advisory Committee (CAC) on Environmental Sustainability as set out by policy P023, Parent and Community Involvement.

Action 10 Publish an annual Environmental Sustainability Report.

4.6. Progress to Date on Reducing Building-related GHG Emissions

YEAR	'90–01	'92–93	'94–95	'96–97	'98–99	'00–01	'02–03	'04–05	'06–07	'08–09
BUILDING-RELATED GHG EMISSIONS (combined natural gas and electricity)										
Estimated (metric tonnes)	315,316 (baseline)	304,853	294,391	283,929	273,466					
Actual (metric tonnes)						263,004	245,762	241,486	223,982	214,827
ENERGY PROJECTS										
Phase I – BAS/Mechanical and lighting retrofits on 32 schools										
Phase II – BAS/Mechanical and lighting retrofits on 54 schools										
Phase III – BAS/Mechanical and lighting retrofits on 118 schools										

YEAR	'90–01	'92–93	'94–95	'96–97	'98–99	'00–01	'02–03	'04–05	'06–07	'08–09
Phase IV (a) – BAS/Mechanical and lighting retro-fits on 119 schools										
Phase V – BAS/Mechanical and lighting retro-fits on 12 schools										
Phase IV (b) – BAS/Mechanical and lighting retro-fits on 119 schools										
Phase VI – BAS/Mechanical and lighting retro-fits on 184 schools										
ECOSCHOOLS										
53 Certified Schools										
173 Certified Schools										
311 Certified Schools										

4.7. Initiatives, 2009–12

The following initiatives will help the Board reach its emissions reduction target of 20% by 2020.

YEAR	2010				2011				2012			
	Jan–Mar.	Apr – June	July - Sept	Oct – Dec.	Jan–Mar.	Apr – June	Jul– Sept	Oct – Dec.	Jan–Mar.	Apr – June	July - Sept	Oct – Dec.
ENERGY PROJECTS												
Phase VI (continued) - BAS/Mechanical and lighting retrofits on 184 schools												
CLIMATE CHANGE PLAN ACTIONS												
Action 1 – Develop a strategic energy plan consisting of:												
a) A detailed technical plan to reduce building-related GHG emissions by a minimum of 20% by 2020 (relative to a 2006 baseline)												
b) School Energy Plans: Re-orient energy management to better support efforts of students, staff, & parents/guardians in platinum-level EcoSchools												
c) A funding plan to facilitate the implementation of the technical plan												
Action 2 – Develop a separate strategic plan to quantify and then reduce all other non-building-related GHG emissions by at least 20% by 2020.												complete 2013
Action 3 – Develop a strategy to quantify and reduce GHG emissions from the Board's fleet of vehicles by participating in a) Toronto Atmospheric Fund's Electric Vehicle (EV)-300 initiative, with the goal of purchasing electric vehicles by 2012, and (b) the Fleet Challenge Ontario's national certification program	3a – EV-300 begins			3b – fleet review complete					purchase vehicles			

YEAR	2010				2011				2012			
	Jan–Mar.	Apr – June	July - Sept	Oct – Dec.	Jan–Mar.	Apr – June	Jul– Sept	Oct – Dec.	Jan–Mar.	Apr – June	July - Sept	Oct – Dec.
Action 4 – Design and install solar photovoltaic (PV) systems on 20 schools per year.							complete 30				20 more	
Action 5 – Work collaboratively with the City of Toronto to develop a community energy plan that links the Mayor's Tower Renewal initiative with local schools.												
Action 6 – Develop school grounds as: (a) community energy hubs	6a – study begins	6a – study complete										
(b) locations for piloting more ambitious food and market gardens at selected schools	6b – ongoing											
Action 7 – Require all schools and offices to switch to once-a-week garbage pick-up (or equivalent) to fund: (a) hiring four seasonal grounds staff for tree planting/maintenance (b) school-based environmental initiatives at the FOS level.												
Action 8 – Sign an agreement to trade TDSB carbon emission credits through the Green Canada Action Fund.	rec. to Board											
Action 9 – Establish a Community Advisory Committee on Environmental Sustainability.												
Action 10 – Publish an annual Environmental Sustainability Report.												

4.8. Role and Involvement of TDSB Departments and External Stakeholders

The Go Green: Climate Change Action Plan builds on the close collaboration between the Eco-Schools group within School Services' Program Department and Facility Services.

Purchasing and Distribution Services, IT Services, and Nutrition Services have all played an important supporting role in helping to make the Board more sustainable and would be expected to continue to do so under this initiative.

The Board's Environmental Sustainability Steering Committee will also continue to help guide decision-making throughout the implementation of the plan, just as they have done for the last two years.

External stakeholders have played and will continue to play an important role in helping the Board become more environmentally sustainable. The City of Toronto and the Government of Ontario not only provide significant funding under this initiative (as they have in the past), but they will also provide valuable expertise, particularly in the more technical aspects of the work that needs to be done. Non-profit organizations such as Evergreen will continue to provide both expertise and on-the-ground support in its implementation.

4.9. Implementation and Evaluation of the Go Green: Climate Change Action Plan

1. *Target date for the launch*: The plan will take effect upon approval of the Board.

2. *Communication plan*: The plan will be communicated using the same mix of the following strategies that have been used to date to support the implementation of the Board's Environment Policy and programs.

    - *Presentations* – A presentation will be made to the Senior Team Council; presentations will be made at FOS Leadership Team Meetings at the request of Superintendents of Education, Ward Councils at the request of Trustees, and school staff meetings at the request of Principals. Another excellent opportunity for communicating the plan will be the EcoSchools annual kick-off sessions that are attended by teams from all certified EcoSchools.
        - *Public website and TDSBweb* will continue to be used as a significant means of communicating major aspects of the plan as it is being implemented. In addition to feature stories, the public website provides two other opportunities for communicating the plan: the Going Green section of the site and the EcoSchools section (ecoschools.ca).
        - *Internal communication tools* will also be used, including *Direct Line* and TEL.
        - *EcoSchools e-newsletter* is published monthly by EcoSchools staff. Its current readership of 2200 highly interested members of our school communities makes it an excellent vehicle for broad outreach.

3. Key performance indicators to measure success:

Student Achievement

- Number and level of certified EcoSchools
- Number of students involved on EcoTeams and in attendance at environmental conferences
- Increased range of and participation in Specialist High Skills Majors (SHSMs), Co-op, and Dual Credit opportunities in "green" areas
- Increased number of students involved as leaders in environmental advocacy through groups such as STEP (Students of Toronto for Environmental Progress)[1]

Parent/Community Engagement

- Number of parents/guardians and community members participating on EcoTeams
- Number of parents/guardians and community members on the Community Advisory Committee
- Area of land converted to urban agriculture
- Number of schools with community gardens
- Number of trees planted
- Number of community partnerships

Financial Stability

- Number of renewable energy projects
- Percentage of the Board's energy that comes from green energy sources
- Amount of waste sent to landfill on a per student per year basis
- Percentage reduction in the Board's GHG emissions
- Operational savings achieved in utilities and waste management
- Funds received from selling carbon credits

4.10. Summary

The Board has many "players and parts" already in place for achieving environmental sustainability: the green measures already implemented; the learning that has been gained from previous and ongoing initiatives; the capacity for action developed in schools through EcoSchools; the solid relationships that have been built among departments; and the partnerships that have been formed with the community and other organizations. What is needed now is a systemic reorientation to formalize a structure that will support and coordinate all the work being done and all the work that still must be done to meet the serious challenge of climate change.

[1] STEP members are environmental leaders from secondary schools across the system mentored by the EcoSchools Youth Leadership Facilitator. The group meets bi-weekly to share ideas and develop action plans for board-wide engagement in EcoSchools. Currently the group has been doing a lot of climate change education and was represented at the Copenhagen Climate Summit by a student from Sir William Lyon Mackenzie CI.

5.0 APPENDICES

Appendix A: Climate Change: A Long-Term and Deepening Crisis
Appendix B: The Toronto District School Board's Environmental Progress: Building on Our Achievements, Fulfilling Ministry Guidelines
Appendix C: Strategic Energy Plan, Action 1A, Develop a Detailed Technical Plan
Appendix D: Strategic Energy Plan Action 1B, School Energy Plans
Appendix E: Renewable Energy Projects Submitted for Provincial Funding, 2009
Appendix F: A Discussion on the Feasibility of Sharing Energy Consumption and Waste Disposal Savings with Schools

6.0 REFERENCE DOCUMENTS

Policy P028, The Environment

Appendix A-1

Climate Change: A Long-Term and Deepening Crisis

Human actions have caused an increase in greenhouse gases. Much of what we do in our daily lives is related to significant greenhouse gas emissions (GHGs)—how we heat and cool buildings, what we consume, how much we throw away, the types of food we eat, the modes of transportation we use. The steps we need to take to significantly reduce greenhouse gas emissions will likely touch most aspects of our lives.

What Are Greenhouse Gases?
The sun radiates heat energy to Earth, and the energy is then reflected upward. Gases in our atmosphere, such as nitrogen, oxygen, argon, carbon dioxide, methane, ozone, nitrous oxide, and water vapour, absorb that energy; they trap most of the heat rather than let it escape back into space. It's what keeps the planet warm and sustains life—thus the "greenhouse." But when the gases increase in quantity or concentration, they trap more of the heat energy, and the Earth gets hotter—the climate changes.

The Earth is now 0.8°C warmer compared with pre-industrial levels (0.6°C of warming in the last 35 years alone) and is increasing by approximately 0.17°C each decade (Homer-Dixon 163).

The United Nations' Nobel Prize-winning Intergovernmental Panel on Climate Change (IPCC) reports that increases in global average air and ocean temperatures, the widespread melting of snow and ice, and rising sea levels indicate that the warming of the planet is "unequivocal" and that human activities (such as the burning of fossil fuels) are "very likely" the cause.

Former World Bank Chief Economist and leading climate change policy analyst Sir Nicholas Stern writes in his seminal new book, *The Global Deal*, that with a temperature increase of 2 to 3ºC, many parts of the world will experience severe dislocation, with rising sea levels, a greater frequency of intense storms and hurricanes, and the melting of glaciers and snows. The conditions will lead to torrents and flooding in wet seasons, droughts in many parts of the world, and a high risk that the major rainforests will collapse. He points out that in the last few decades, at around "only" a 0.8ºC increase, we have already seen some of the first forerunners of what might happen (Stern 29).

The Intergovernmental Panel on Climate Change
The IPCC is the world's most trusted source for advice on the science of climate change. The panel is made up of scientific experts nominated by member countries of the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO). Its role is to assess scientific, technical, and socio-economic information on climate change from around the world. In 2007, the IPCC issued its most recent executive summary for policymakers on the physical science basis for climate change. For more information, visit www.ipcc.ch.

What Is Happening? A Sample of Recent Climate Change Findings

- The most dramatic illustration of a 0.8°C rise in temperature is the effect on Arctic sea ice. In the last 30 years, there has been an overall 8% decrease (or more than 1 million square kilometres) in annual sea ice extent, and a 15 to 20% decrease during the summer months. Arctic ice is also thinner—in some areas, up to 40% (*Arctic Climate Impact Assessment*).

- Researchers at the U.S. Naval Postgraduate School in Monterey California believe that the Arctic could be completely free of ice in the summer as early as September 2013 (BBC News).
- Despite Toronto's cool summer this year (2009), the U.S. National Oceanic and Atmospheric Administration has reported that the ocean surface temperature in June was the warmest on record and the combined global land and ocean surface temperature for that month was the second warmest on record (NOAA 2009). Global record-keeping began in 1880.
- A temperature increase of 0.8°C is already proving traumatic in many parts of the world. In Europe, 35 000 people died as a direct result of the heat wave in the summer of 2003. Western South Africa, Australia, and parts of Mediterranean Europe are experiencing severe water shortages, and in some cases rely on desalination and rationing.
- The absorptive capacity of tropical forests—considered an important "carbon sink"—is falling as a result of deforestation. Two percent of tropical forests are cut down each year. Rising emissions combined with reduced absorptive capacity means that the concentration of greenhouse gases in the atmosphere is increasing faster than ever.
- From 1930 to 1950, the concentration of all greenhouse gases (the 6 greenhouse gases identified at the Kyoto Protocol) increased by about 0.5 parts per million (ppm) per annum; from 1950 to 1970 by around 1 ppm per annum; and from then until 1990 the rate of increase doubled again. In the past decade it has been around 2.5 ppm a year (Stern 25).
- In response to the weight of evidence, the G8—representing the world's leading industrialized nations—has heeded scientific advice and agreed to reduce greenhouse gas emissions by 80% by 2050: "80 by 50."

The Kyoto Protocol is an agreement linked to the United Nations Framework Convention on Climate Change and was first adopted on December 11, 1997, in Kyoto, Japan. The goal was to stabilize concentrations of greenhouse gases (GHGs) in the atmosphere. The protocol identified four GHGs (carbon dioxide, methane, nitrous oxide, sulphur hexafluoride) and two groups of industrial gases (hydro fluorocarbons and per fluorocarbons) to be reduced. As of 2009, 184 parties have ratified the protocol.

Canada's Position

As a signatory to the Kyoto Protocol, Canada committed to reducing its GHG emissions by 6% below 1990 levels by 2012. Armed with good intentions while continuing "business as usual," Canada's GHG emissions are currently 26.2% *above* 1990 levels, the worst record in the G8. Other developed countries put us to shame.

Analysts estimate that the consequences of proceeding with business as usual regarding GHG emissions would be a 50 to 70% probability of temperatures exceeding 5°C by 2050, with a 40% chance of being above 6°C (Stern 26). Stern writes:

> *…with temperature changes of this magnitude, the physical geography is rewritten. If the physical geography is rewritten then so too is the human geography of the world. There would be movement of people on an immense scale. The lessons of the last few hundred years surely tell us that the movements of billions of people in a fairly short time would plunge the world into massive and extended conflict* (Stern 31).

Appendix A-3

Canada's failure to reduce its emissions means that the future quality of life for today's youth is being jeopardized. Admittedly, it cannot be known for sure what the future will bring, but without major GHG reductions, experts assert that there is a "high probability" that temperature increases will be significant and will have a serious negative impact, first on the world's poor, and then eventually on rich countries, including Canada.

Only major reductions in GHG emissions—at least 80% in industrialized countries and 50% in the world as a whole by 2050—will reduce, but not eliminate, the risk of temperatures going even higher than 2°C.

France has reduced its emissions 5.3% below 1990 figures. Germany has reduced its emissions by 21% to 0.6% below 1990. The UK emissions have declined by 17% to 5% below 1990. Even the U.S. record under President Bush—23% above 1990—is better than Canada's.

Climate Change: Changing Course

Stern argues that the world economy can be remade to achieve "low carbon growth." An economy based on this principle could drastically reduce emissions, usher in a new era of economic prosperity, and help further alleviate world poverty. To reduce emissions by 80% by 2050 would require rapid progress in four key areas:

1. using energy much more efficiently in buildings, industry, transportation, power generation, and agriculture
2. halting the deforestation currently taking place in tropical rainforests
3. putting existing and emerging technologies to work—for example, wind, solar, hydro, wave and tidal, geothermal, and electric cars
4. investing in new and emerging technologies that are on the horizon, but not yet commercially viable—for example, further improvements in solar power, better batteries, enhanced photosynthesis, and a new generation of biofuels

This is not business as usual. It is not incremental change. It is not about waiting for someone else—the government, corporations, or other countries—to get started first while we sit on the sidelines. To understand the magnitude of the problem is to understand the amount and the pace of change required at all levels of society—in homes, large corporations, medium and small business, government, cities, towns, farms—and in school boards and their schools.

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Appendix A-4

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Appendix B-1

The Board's Environmental Progress: Building on Our Achievements, Fulfilling Ministry Guidelines

The goals outlined in the Ministry of Education's new environmental education policy framework, *Acting Today, Shaping Tomorrow*, are organized around three themes: teaching and learning; student engagement and community connections; and environmental leadership.

Within the Board, EcoSchools already helps to fulfill these goals by providing many opportunities for linking environmental action to curriculum. EcoSchools, in fact, serves one of education's principal purposes—to help young people understand and interpret their world and explore possibilities for making their own contribution to solving its challenges.

Through its existing Environment Policy (2000) the Board has already committed itself to practising sustainable development. The policy clearly aligns the Board with the Ministry of Education's theme of showing leadership in environmental responsibility:

> *By exercising environmental responsibility in their own operations, organizations within the education system can serve as models of corporate citizenship for students and the broader community and ensure coherence with the environmental messages conveyed by the curriculum* (Acting Today 18).

To illustrate the consonance of purpose that the Ministry's environmental education framework and the Board's environmental history shares, following are some of the environmental initiatives that are already in place. The Board:

- has reduced its greenhouse gas emissions by 18% since 2000–01 by retrofitting lighting systems, installing controls in buildings and portable classrooms (Building Automation System/mechanical retrofits), and engaging school staff and students in reducing consumption
- has created, and continues to revise, the EcoSchools program in response to schools' changing needs. Support for teachers focuses on developing knowledge and skills to integrate environmental issues, and climate change in particular, into classroom program, which again shows us to be already closely aligned with the curriculum requirements of the new Ministry environmental policy framework. This year, 55% (or 311) of the Board's schools are certified as bronze, silver, gold, or platinum EcoSchools. The Board's 16 platinum EcoSchools represent a standard of environmental excellence that is not matched by any other school district in the English-speaking world. The Toronto District School Board's EcoSchools program has been adopted by more than 30 school boards in Ontario, where an additional 600 EcoSchools have been certified in 2008-09.
- has transformed its school grounds more than any other school board. Its partnership with the non-profit organization Evergreen—supporting schools in the greening of their grounds—has been copied by many school districts throughout Canada.

- leads the country in the design and construction of high-performance green schools as certified by the Canadian Green Building Council under its Leadership in Energy and Environmental Design (LEED) program
- is undertaking significant renewable energy projects with the installation of a geothermal system at Highfield Junior School and a 10-kW solar photovoltaic system at William Lyon Mackenzie Collegiate Institute
- supplies its schools with more green products than any other school board in the province (e.g., cleaning products, appliances, and 100% recycled copy paper)
- is the only major organization in Ontario to ensure that its T8 fluorescent lights are diverted from landfill, and the component materials recovered and reused

While the Board has made great progress, pressure is building for it to do more. The circumstances may appear contradictory: If the Board is doing so well, then why is it facing this pressure? The fact is that the world's environmental crisis is deepening. The Board can point to considerable accomplishments when compared with others in the education sector, but it is not enough relative to what needs to be done.

In the last school year, trustees have asked staff to report on a wide range of environmental issues, including the feasibility of the following:

- Sharing some of the energy, waste, and water savings with participating schools
- Eliminating the use of bottled water in schools and offices
- Undertaking a range of renewable energy projects
- Directing some of the money earned through the sale of properties to energy projects
- Developing urban farms and community gardens on school grounds

Like all organizations, the Board has limited resources. Much can be done with the use of existing resources, as long as time, effort, and money are spent wisely. Whether the next ten years will see the kinds of environmental gains that the Board has made over the last ten years will depend on how well it plans, makes decisions, and allocates its resources.

Appendix C-1

Strategic Energy Plan Action 1A, Develop a Detailed Technical Plan:

A detailed technical plan to reduce building-related GHG emissions by a minimum of 20% by 2020 (relative to a 2006 baseline)

The Board will issue a Request for Proposals to select consulting services to develop a detailed technical plan to reduce emissions by 20% by 2020. The Board will invite interest from highly innovative teams led by a primary consultant and supported by secondary consultants (hereafter called "the proponents") who bring a diversity of expertise and experience to the project. The proponents will demonstrate expertise in:

- working collaboratively with a wide range of internal and external stakeholders (such as technical and program staff, school staff, students, parents/guardians, and other consultants)
- designing and implementing both conventional energy m buildings and a broad range of renewable technologies
- benchmarking the energy performance of buildings
- planning and executing consultative processes that bring together a broad range of internal and external stakeholders
- successfully managing difficult change processes

Full and visible executive endorsement of a renewed focus on energy conservation will be essential to building a comprehensive, long-term energy plan. This endorsement will be critical in giving authority and profile to the work of staff developing the plan. Key members of staff will need to have a thorough understanding of the factors that promote or hinder energy conservation.

The team should also include members with expertise in managing complex organizational transformation and who have a deep understanding of the Board's Facility Services department, including its work processes and culture.

The proponents will work in close collaboration with the Facility Services Quality Group, who will establish a cross-functional project team to help implement significant components of strategic energy plan. The cross-functional team will include representatives from schools and other central departments as well as Facility Services.

Deliverables for Action 1A: Developing a Detailed Technical Plan

Specific Deliverable	Explanation of the Deliverable
Primary Deliverable I: Help the Board develop a detailed technical plan for reducing its GHG emissions by 20% by 2020	
A detailed strategic plan:	The plan will include measures that are proven best

Appendix C-2

Specific Deliverable	Explanation of the Deliverable
The proponents will help develop a detailed outline of specific initiatives, milestones for the plan's implementation, and all relevant financial details including capital costs, payback, and possible financial strategies that will ensure that the plan can be implemented.	practices in energy management, including: upgrading of dampers, weather-stripping, and other causes of infiltration upgrading older BAS systems upgrading to energy-efficient gas-fired equipment installing most energy efficient air conditioning, where required upgrading to energy efficient fans and motors The plan will also include a process for implementing emerging technologies such as LED lighting systems, solar photovoltaic, solar thermal, district heating and cooling (i.e., geo-exchange technologies—(more information, following), as well as green and cool roofs. Enhancing building envelopes by adding insulation to walls and roofs should be considered (more information, following). A maintenance and staff development program will also be outlined in detail, including the annual investments required in these areas. The plan should show in detail a careful estimate of the energy savings that could be achieved with each measure over the next ten years.
Primary Deliverable II: Quantify the full potential for renewable energy technologies in Toronto public schools.	
The strategic plan should include a detailed plan for the development of solar photovoltaic, solar thermal, and district and cooling systems (geo-exchange technologies). i. Solar Photovoltaic (PV)	

Appendix C-3

Specific Deliverable	Explanation of the Deliverable
A report that includes (1) a school-by-school inventory of the total potential for solar PV on "Class A" roofs and south-facing walls; and (2) a timeline for the development of the resource, including capital costs and payback.	Class A roof and wall space is neither shaded nor accessible to potential vandals. Our expectation is that the greatest potential will be in the several hundred schools in suburban areas that are not affected by neighbouring buildings or large mature trees.
ii. Solar Thermal	
A report that includes (1) a school-by-school inventory of the total potential for solar thermal systems; and (2) an estimate of the amount of energy that can be generated, and a timeline for the development of the resource, including capital costs and payback.	The Board's expectation is that most schools can benefit from small systems for domestic hot water and larger systems for schools with Board-operated pools. In addition, a small number of additional special facilities, such as Mono Cliffs Outdoor Education Centre, which use a lot of hot water for other purposes, such as showers, would be included.
iii. Cool Roofs and Green Roofs	
A report that summarizes the feasibility of and provides recommendations for establishing cool (light coloured) roofs and green roofs on schools.	The main issue for developing cool and green roofs is going to be identifying an appropriate funding source. The long-term maintenance of green roofs will also have to be carefully considered.
iv. District Heating and Cooling Systems (Geo-exchange Technologies)	
A report that includes (1) a list of the top 20 to 30 school properties that offer the greatest potential for developing district heating and cooling systems; and (2) an estimate of the amount of power that could be generated, the capi-	The Board is interested in understanding the potential for developing district heating and cooling systems underneath school grounds, with the goal of supplying power to neighbouring commercial and private properties. It is likely that the schools located in very dense parts of the city will have the most potential.

Appendix C-4

Specific Deliverable	Explanation of the Deliverable
tal cost of developing the projects, and revenue potential.	
v. Detailed Financial Strategy	
A report that outlines detailed options for paying for the capital cost of fully developing the Board's potential in solar photovoltaic, solar thermal, and geoexchange.	The proponents need to bring a high level of experience and innovation to the question of how the Board will pay for the development of renewable energy in both the short and long term. The Board requires a detailed exploration of at least three or four options that includes an analysis of the feasibility and the advantages and disadvantages of each approach.

Primary Deliverable III: Study the feasibility of improving building envelopes by adding insulation to the walls and roofs of schools.

Primary Deliverable IV: Study the performance of TDSB manufactured windows in order to develop and implement improvements.

Appendix D-1

Strategic Energy Plan Action 1B, School Energy Plans:

Refocus energy management resources to better support the efforts of students, school staff, and parents/guardians

The Board will issue a second Request for Proposals to select consulting services to help it reorient energy management to better support the efforts of local schools. The Board will invite interest from highly innovative proponents who bring a diversity of expertise and experience to the project.

The proponents will demonstrate expertise in all of the areas outlined in the first RFP. However, there will be a special emphasis placed on the experience and expertise of proponents in facilitating exemplary consultation sessions at the local school level.

Deliverable	Explanation of the Deliverable
Primary Deliverable: Help the Board develop a more coordinated and integrated approach to reducing energy consumption in schools and focus its resources on platinum EcoSchools.	
The development and publication of an easy-to-understand workbook that will help guide and coordinate an integrated approach to reducing energy consumption in schools, modelled on the Board's *Transforming the Schoolyard: How local school communities design and build their playground learning environments.*	The Board already invests significant resources in various aspects of its energy program, from BAS/mechanical retrofits to renewable energy projects, portable classroom retrofits, BAS maintenance and training, and EcoSchools. However, these efforts tend to be dispersed and largely uncoordinated over its 650 buildings. The proponents will start by reviewing how energy is currently being managed at the Board and provide recommendations for how current practices might be improved. The proponents will also work with key stakeholders—including central technical staff and school-based staff—to devise a more integrated approach for reducing GHG emissions in school buildings that includes taking simple measures (such as reducing the number of refrigerators and installing compact fluorescent lights), to upgrading building automated systems and undertaking mechanical retrofits, to installing renewable energy technologies.

Appendix E-1

Renewable Energy Projects Submitted for Provincial Funding, 2009

FOS	Name	Total PV Ca-pacity (kW)	Solar HW	Geothermal	Wind
NW1	Elmlea JS	53	x		
NW5	Kipling CI	43	x		
NW6	Martingrove CI	64	x		
SW1	Lakeshore CI	16	x		
NW2	Shoreham PS	15	x		
NW3	Northview Hts SS	76	x		
NW4	York Memorial CI	10	x		
SW2	Fern Avenue PS	5	x		
NW3	Yorkdale Adult SS	55	x		
SW6	Dovercourt PS	20	x		
SW5	City School	30	x		x
SW3	Maurice Cody PS	14	x		
NE1	AY Jackson SS	97	x		
NE1	Earl Haig SS	35	x	x	
NE6	Owen PS	30	x	x	
SW5	Jarvis CI	25	x		
SW4	Jackman	32	x		
SE5	Malvern CI	16	x		
SE6	East York CI	42	x		
SE6	Kew Beach	20	x	x	
NE5	Cassandra	28	x		
SE1	SATEC W A Porter	20	x		
SE5	R H King Academy	40	x		
SE2	Cedarbrae CI	35	x		
SE3	Woburn Junior	31	x		
NE2	Sir J A Macdonald	20	x		
NE3	Dr. N Bethune CI	46	x		
NE4	Banting and Best PS	35	x		
SE4	Sir Oliver Mowat CI	30	x	x	
NW6	Mono Cliffs	100	x		

Appendix F-1

A Discussion on the Feasibility of Sharing Energy Consumption and Waste Disposal Savings With Schools

On February 11, 2009, the Board of Trustees asked staff to comment on the feasibility of sharing "the financial savings associated with any decreased use of water, solid waste or energy in their school where these savings are attributable to the school's conservation measures as opposed to equipment or capital upgrades."

Sharing savings is recommended if done carefully

Sharing savings with schools is feasible and recommended as long as schools are considered as a group and not individually. Take the calculation of energy savings as an example. On an individual school basis, energy consumption can fluctuate for a wide variety of factors that are difficult for anyone to control, let alone school staff and students. New portables increase energy consumption as does the purchase of any new equipment such as computers. Any form of extensive repairs or construction within a school can raise consumption because this work tends to be very energy intensive.

Calculating energy savings of schools as a group

However, considered as a group, it is possible through a statistical analysis to estimate how much energy school staff and students are saving. A 2006 consultant's report found that certified EcoSchools on average use 12% less electricity and 7% less natural gas than non-EcoSchools. Assuming that these savings apply to the 264 schools certified during the 2008/09 school year, EcoSchools accounts for about 2 million of the overall 7.89 million m^3 reduction in natural gas and about 14.29 million kWh of the 67.5 million kWh drop in electricity consumption.

If these numbers are correct, then EcoSchools saved the Board about $2.5 million in energy costs in 2008/09

Solid Waste Removal and Disposal

In 2007–08, the Board spent $1.6 million on waste removal and disposal.

Waste savings

How much money is EcoSchools saving in this area? Arriving at a reliable figure for waste savings by EcoSchools is a

more straightforward calculation than determining energy savings.

By comparing the amount of waste that EcoSchools and non-EcoSchools send to landfill, it is estimated that Eco-Schools saved the Board about $97,000 in waste disposal costs in 2007-08.

The results for 2008-09 are more impressive. One hundred and seven schools switched from twice-a-week to once-a-week pick-up of their bulk garbage bins. This reduction in pick-up frequency will save the Board about $155,000 annually.

Total

In 2008–09, the 264 certified EcoSchools saved the Board an estimated $2.75 million through reduced energy consumption and by sending less waste to landfill.

Investing savings in schools – What has been done so far?

In 2008-09, Facility Services invested $696,833 in Eco-Schools—about 1 in 4 of the dollars that the EcoSchools program saves through energy conservation and waste minimization. This represents about 70% of all EcoSchools funding.

In addition to providing four central support staff, in 2008/09 this investment helped to pay for a wide range of support and services for schools, including:

- Planting and caging 210 large trees at 30 schools
- Half-day kick-off sessions for teams from 264 certified EcoSchools
- Ten leadership seminars for secondary school student teams from 35 schools
- On-site school ground greening design consultations at 100 schools
- Three middle school student leadership conferences for teams from 30 schools
- Interim audits and in-school mentoring at the 36 schools that applied for platinum certification and end-of-the-year audits for 311 schools
- A recycling subsidy program that reimburses 50% of the

cost of recycling containers for schools

- A compact fluorescent light program that provides free energy efficient light bulbs to schools
- Phone, email, and in-school support for schools working towards certification
- The development of a new on-line application system for schools to make it easier for schools applying for certification

Going further and investing more under the Go Green Climate Change Action Plan

In the Go Green Climate Change Action Plan, Facility Services significantly increases its investment in schools. (See Action 7.)

For the first time, an estimated $250,000 will be allocated to Families of Schools who will ultimately decide how the money will be allocated to schools at the local level. An additional $250,000 will be invested in an expanded large-tree planting program. This money will go even further because it will leverage major annual investments from the City of Toronto that donates large trees for our school grounds. At least 60 schools a year will benefit directly from this program.

The Go Green Climate Change Action Plan also calls for a refocusing of energy management resources to better support the efforts of students, school staff, and parents/guardians in schools that are working hard to reduce their school's impact on the environment. School EcoTeams respond extremely well when they feel that they are being supported in tangible ways—for example, by the installation of motion sensors to control lighting in gymnasiums, the upgrading of Building Automated Systems, not to mention the design and installation of renewable energy projects in their schools.