UNESCO Associated Schools Network

BUILDING CLIMATE-READY SCHOOLS IN CANADA

Towards Identifying Good Practices in Climate Change Education

Building Climate-Ready Schools

Towards Identifying Good Practices in Climate Change Education

UNESCO Associated Schools 2018

The Sustainability and Education Policy Network (SEPN) is an international network of researchers and organizations advancing sustainability in education policy and practice. The evaluation was undertaken by the Sustainability and Education Policy Network (SEPN), which is hosted by the Sustainability Education Research Institute (SERI) at the University of Saskatchewan. The Canadian Commission for UNESCO contracted SEPN to conduct an evaluation of climate action in the Canadian UNESCO Associated Schools Network in 2018. Visit www.sepn.ca to learn more.

Authors: Nicola Chopin, Kristen Hargis, & Marcia McKenzie
Cover photo: Nicola Chopin. All rights reserved.
Graphic design: Nicola Chopin and Kristen Hargis
Photos were provided by ASPnet schools and depict their different activities. All rights reserved.

Published in Canada

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

ACE	Action for Climate Empowerment Guidelines
ASPnet	UNESCO Associated Schools Project, commonly called UNESCO Associated Schools
CCUNESCO	Canadian Commission for the United Nations Educational, Scientific and Cultural Organization
CMEC	Council of Ministers of Education
ESD	Education for Sustainable Development
GCED	Global Citizenship Education
GHG	Greenhouse Gas
OECD	Organisation for Economic Co-operation and Development
SEPN	Sustainability and Education Policy Network
SERI	Sustainability Education Research Institute
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change

BUILDING CLIMATE-READY SCHOOLS

BACKGROUND

This report overviews the findings of an evaluation of UNESCO's *Getting Climate-Ready: A Guide for Schools on Climate Action*. The goal of the evaluation was to identify good practices of climate action taking place in Canadian UNESCO Associated Schools Project Network, using a whole school approach as a lens. The evaluation was developed with consideration to UNESCO frameworks and the *Getting Climate-Ready* guide and undertaken by the Sustainability and Education Policy Network (SEPN), which is hosted by the Sustainability Education Research Institute (SERI) at the University of Saskatchewan.

A companion document entitled, *Ten Canadian Schools' Stories of Climate Action: A Collection of Promising Practices from the Getting Climate-Ready Pilot Project,'* highlights stories of promising practices of climate action captured by the evaluation may be found on CCUNESCO and SEPN's websites.

The UNESCO Associated Schools Project Network (herein referred to as ASPnet) links educational institutions across the world around a common goal: to promote quality education in pursuit of peace and sustainable development. ASPnet is recognized by UNESCO as an effective mechanism for contributing to Sustainable Development Goal 4 - Education 2030 to achieve target 4.7 on Global Citizenship Education (GCED) and Education for Sustainable Development (ESD), as well as target 13.3 on climate action. All schools that join the network make a commitment to support UNESCO's ideals through four pillars of learning and four themes of study:

Pillars of Learning	**Themes of Study**
Learning to live together	Intercultural Learning
Learning to be	Global Citizenship Education
Learning to do	Education for Sustainable Development
Learning to know	UNESCO and UN Priorities

ASPnet schools are agents for positive change. They:
1. Help to implement UNESCO's strategies and programs in education, science, culture, and communication;
2. Serve as laboratories of ideas on innovative approaches for quality education for all;
3. Translate the four pillars of 21st century education—learning to know, learning to do, learning to be, and learning to live together—into practice.

In 2016, UNESCO began the *Getting Climate-Ready* pilot project in 25 countries to help ASPnet schools engage in climate actions to reduce the effects of climate change. As part of the *Getting Climate-Ready* project, 10 ASPnet schools in Canada worked to incorporate climate action into every aspect of school life using an increasingly common approach known as the "whole school approach" (UNESCO, 2016; Henderson & Tilbury, 2004).

This report outlines the results of an evaluation exploring climate action taking place in Canada's ASPnet schools. We collected information from 10 schools that participated in the *Getting Climate-Ready* pilot project, as well as comparative data from an additional 17 schools that were not participating in the pilot.

The report begins with a review the scholarly literature, in which we outline current research-based considerations for good climate change education practice, which was used to help frame the evaluation, as well as informed the analysis and recommendations. We then provide an overview of the evaluation methods and review key findings from the evaluation with consideration to identifying good climate change education practice. We conclude with a summary and recommendations for next steps towards strengthening the current climate change education practices occurring in Canada's ASPnet schools.

GOOD PRACTICES IN CLIMATE CHANGE EDUCATION: CONSIDERATIONS AND CURRENT RESEARCH

The field of climate change education research is still in its infancy and very few scholarly reviews have been conducted to date. In a literature review on learning, communication, and public engagement about climate change, Wibeck (2014) found the number of studies published on climate change communication increased in most years during the review period, in particular from 2007 onwards. Themes in the research literature identified in the review included barriers to climate change communication, and the identification of communication 'solutions' such as focusing on the framing of issues, solutions versus problems, avoiding fear-based communication, using accessible communication approaches including metaphors and images, and considering the audience being targeted.

Students Working in the Greenhouse at Collège Bourget

Discussing education more specifically, Gonzales-Gaudiano and Meira-Cartea (2010), in a chapter in the edited volume on *Education and Climate Change: Living and Learning in Interesting Times* (edited by Kagawa and Selby), also highlight several barriers to climate change education. For example, the complexity of climate science complicates science communication, particularly in light of historic optimism about progress always producing a better future. In addition, sociopolitical, psychosocial, socio-emotional, and cognitive barriers contribute to inaction. For example, it is difficult for individuals to link their small individual emissions contributions to the global climate system and there is a tendency to transfer responsibility for climate action onto others, such as industry, politicians, and governments. In addition, climate change is closely linked to our way of living and the personal costs of making changes is perceived to be high.

Protest Art Made by Students at Queen Elizabeth High School

A third literature review by Brownlee and colleagues (2013) focuses on socio-emotional factors influencing beliefs and understandings of climate change. These include psychological processes such as confirmation bias (people tend to look for information that is consistent with beliefs they already hold), loss aversion (feelings of entitlement to maintain a current level of prosperity), and beliefs that individual actions are insufficient to combat global climate change. The authors also discuss consumption of fossil fuels as a cultural as well as a technological phenomenon, and the difficulty in developing policy responses due to climate action being tied in different ways to political ideologies.

However, none of these reviews undertake an examination of existing research on climate change education itself. A focus on climate change education specifically is relatively recent in educational research, and considerations such as those identified in the above reviews are only beginning to be taken into account in designing climate change education programs and research studies of such programs or related policies. Our own review of articles on climate change education for a virtual special issue on climate change and education in the journal *Environmental Education Research* (edited by Reid & McKenzie, 2017) suggests main foci of existing research are: i) students' knowledge/perceptions/beliefs on climate change; ii) including influences on those beliefs such as connecting to place, family, and other life experiences; and iii) a number of articles on the framing of climate change in education and communications (as a climate justice issue, as a health issue, etc.).

Climate change literacy on its own does not make for changed action (see, for example, Kahan et al., 2012) and even those with knowledge of the science of climate change often do not 'believe in it' in the face of scientific evidence. While previous research has found that climate change knowledge is a factor

in educators feeling confident and justified in including climate change focused curriculum in education and knowledge of the science of climate change is important, including an understanding of the scientific consensus that climate change is human-induced alone is not enough to impel students, or educators, or community members, to take action to address climate change.

In terms of addressing more subtle forms of denial, in which people believe in the science of climate change but just don't prioritize changes in their actions, this is not a new problem for forms of environmental education. In the classic article by Anja Kollmus and Julian Agyeman on 'Mind the Gap: Why do People Act Environmentally and What are the Barriers to Pro-Environmental Behavior,' the authors identify several factors as to why people do act environmentally. Factors such as demographics, values, social group, sense of immediacy of the issue, and so on, matter in how people respond to climate change (Kahan et al., 2012). As a result, pedagogical approaches much connect climate change education to values and issues that matter to students so they are more likely to care about climate change and feel compelled to take and support action to address it. In their book, The Psychology of Climate Change Communication: A Guide for Scientists, Journalists, Educators, Political Aides, and the Interested Public, Shome, and Marx (2009) identify key barriers to scientific communication and provides a variety of educational tools and communication strategies.

Finally, limited materials are available on how the location of the educational setting is important in how climate change education is engaged, there are materials on this in relation to environmental education more broadly. This also does come out as a factor in terms of the importance of 'local framing' in the above guide. A special issue on Land Education by Tuck, McKenzie, & McCoy (2014) explores this topic in greater detail.

Students at École Francophone D'Airdrie Participate in a UNESCO Mini-Conference

Climate Change Education Policy

What is still needed, is increased research focus on what our broader understandings of education, as well as growing interdisciplinary understandings of climate change responses, mean for how to do climate change education (i.e., educational aims, pedagogies, and including how 'audience' and location matter in determining appropriate aims and means). As well, there has been very little research on the inclusion of climate change in education policy to date (see recommendations for research on the latter focus in Aikens, McKenzie, & Vaughter, 2016).

The international Action for Climate Empowerment guidelines, recently developed by United Nations Framework Convention on Climate Change (UNFCCC, 1992) and UNESCO (2016) were intended to help member countries meet their commitments to climate change education, training, and public awareness. As of 2018, Canada has not yet developed a national strategy in response to the ACE guidelines and to meet their Convention commitments in this regard. However, given that the K-12 education system in Canada is federated (province- and territory-based), and that post-secondary and non-formal education sectors are even more distributed, developing national climate change education policy is difficult.

At the K-12 level, the Council of Ministers of Education (CMEC) brings together provincial and territorial Ministers of Education to develop pan-Canadian priorities and strategies. A CMEC working group on Education for Sustainable Development has helped support curriculum focus in this and related areas in various provinces/territories, and this focus is now being incorporated into an emphasis at CMEC on global citizenship. These priorities are being led in part UN and OECD initiatives and terminology, previously in relation to the Decade of Education for Sustainable Development (2005-2014), and now with an increasing focus on global competencies due to its inclusion in indicators on PISA standardized tests.

In terms of inclusion of climate change and other sustainability issues in formal education across various Canadian provinces and territories, comparative research in the Canadian K-12 formal education sector by Bieler, Haluza-DeLay, Dale, and McKenzie (in press) found shallow engagement with climate change in education policies, as well as an overwhelming focus on energy efficiency upgrades in schools. As a result, the authors call for greater uptake of holistic responses to climate change in the Canadian K-12 education system.

Climate Change Education Practice

At present, there are several primary approaches to climate change education. There is a large current focus on teaching the science of climate change. For example, these resources for educators from NASA's website, include activities that "help bring climate science to life," as well as the approaches and resources provided by the US-based CLEAN Network. Another recently released US-based resource which focuses on teaching climate change science is the Teacher Friendly Guide to Climate Change. CC Learn is a UN-affiliated network that in part develops resources to support learning 'on climate change.'

Student Video Challenges on Carbon Neutral Day at Collège Sainte-Anne

Other approaches emphasize the climate justice aspects of climate change, or in other words, how the impacts of climate change are disproportionately felt by those already marginalized through poverty, racialization, globalization, colonization, and other forms of oppression. For example, the Canadian Centre for Policy Alternative's BC office has an educator resource, Climate Justice in BC, with this overall focus.

Other organizations and approaches focus on the impacts of climate change for other species, such as in the World Wildlife Fund's Climate Change Educator Resources.

Finally, other approaches focus on how making climate change, or environmental issues more broadly, matter to students means connecting with who they are and what's important to them and their communities. For example, the Australian Youth Climate Coalition has developed an integrated pedagogical approach to engage youth and schools in climate change education.

What Makes Good Climate Change Education?

In sum, traditional approaches towards climate change education have focused on improving understanding the science of climate change (Wibeck, 2014). Evidence suggests, however, that higher levels of scientific knowledge do not automatically mean increased climate belief or action (Kahan et al., 2012). Additionally, climate change education often focuses on changing individual values, beliefs or behaviors (Brownlee, Poweell, & Hallo, 2013), even though climate change beliefs only moderately affect climate actions (Hornsey, Harris, Bain, & Fielding, 2016). While the field of climate change education is still in its early stages, evidence to date suggests 'good' climate change education should focus more on socio-emotional learning and the cultural contexts in which the learning occurs.

THE GETTING CLIMATE-READY PILOT PROJECT

In 2016, UNESCO began the *Getting Climate-Ready* pilot project in 25 countries to help ASPnet schools engage in climate actions to reduce the effects of climate change.

The ASPnet climate change project spanned two years (2016-2018) and mobilized comprehensive and coordinated action in 25 countries globally. Worldwide, the project reached approximately 200,000 students and 12,000 teachers (UNESCO, 2017). The project was intended to include a review of current school activities on sustainable development, establishment of a whole-school climate action team, train-the-trainers workshops for the National ASPnet Coordinators and school project facilitators, and the development of Action Plans. UNESCO widely distributed the *Getting Climate-Ready* guide as well as a list of teaching and learning resources on climate change. In 2016, UNESCO also launched the ASPnet online tool (OTA), a new participatory hub on the whole-school approach to ESD.

As part of the *Getting Climate-Ready* project, 10 ASPnet schools in Canada worked to incorporate climate action into every aspect of school life using an increasingly common approach known as the "whole school approach" (UNESCO, 2016; Henderson & Tilbury, 2004). In adopting a whole school approach to climate change, educational institutions integrate climate change action into every aspect of school life (UNESCO, 2016; Henderson & Tilbury, 2004). The aim is to develop a school culture of sustainability where everything the school does furthers action on climate change (UNESCO, 2016 Henderson & Tilbury, 2004). Climate action activities recommended by the whole school approach and *Getting Climate-Ready* (2016) guide include:

SCHOOL GOVERNANCE
The entire school and its leadership have an overall focus on climate action and a culture of sustainability.
- Conduct a self-assessment of current climate action at your school
- Establish a climate action team
- Create a climate action plan and/or include climate action in your school's strategic plan
- Include climate action in your school's mission, vision, and values statements

TEACHING AND LEARNING
Climate action is included in all academic courses, inside and outside of the classroom.
- Incorporate climate change into all subjects
- Teach critical, creative, and futures thinking skills
- Provide opportunities to learn about, through, and from climate action

WHOLE SCHOOL APPROACH

SCHOOL GOVERNANCE — TEACHING AND LEARNING — FACILITIES AND OPERATIONS — COMMUNITY PARTNERSHIPS — CLIMATE ACTION

SCHOOL CULTURE OF SUSTAINABILITY

FACILITIES AND OPERATIONS
Schools become a model of climate action through changes to physical buildings and school campuses.
- Plant native flowers, trees, fruits, and vegetables
- Turn off lights and electronics when not in use
- Buy products that are local and/or made ethically
- Encourage students and staff to use more sustainable transportation, bring litterless lunches, and conserve water

COMMUNITY PARTNERSHIPS
Schools engage and partner with the community on climate action projects.
- Collaborate with other schools, neighbourhood associations, local businesses, local organizations, and networks on climate action
- Partner with the broader community to take learning outside the classroom (e.g., student action projects based on a real-life need of an environmental group, field trips to measure biodiversity, host community events)

The active involvement of all educational stakeholders, both inside and outside the school, is a crucial component of the approach, and the approach works best when all members of the school community are involved (UNESCO, 2016).

In practice, the four domains often interact with one another and climate action initiatives taking place in schools often fall under more than one domain.

The *Getting Climate-Ready* guide provides a step-by-step framework which schools can use to become more climate friendly (UNESCO, 2016). Its development was informed by scholarly literature, national and international guidelines, and program websites, as well as a survey of climate action projects in 55 ASPnet schools in 12 countries (UNESCO, 2016).

Protest Art Made by Students at Bruce Peninsula District School

EVALUATION METHODS

The following section outlines the methods for evaluating the *Getting Climate-Ready* climate action pilot project.

DATA COLLECTION

Data were collected from 10 pilot project participants through a 20-minute pre-interview survey, as well as semi-structured telephone interviews lasting between 45-60 minutes. An additional 17 non-pilot schools responded to a 20-minute survey to collect comparative data on current climate action practices happening in ASPnet schools in the absence of the support of the *Getting Climate-Ready* pilot project. Data were collected between March 8 and April 9, 2018.

Hafford Central School's 2018 Tree Planting Team

To recruit participants, the national coordinator emailed the participating schools introducing the evaluation and SEPN's researchers. SEPN then sent an initial recruitment email to each ASPnet school facilitators to schedule an interview, using the database provided by the national coordinator. Within this email, facilitators were given the option to have a joint interview. Up to three follow up reminder emails were sent to participants who hadn't yet responded to the survey or scheduled an interview.

Recruitment efforts were directed to all ASPnet facilitators in each pilot school, and one facilitator from each school completed the survey and interview.

Pre-interview Survey

The pre-interview survey collected qualitative and quantitative information regarding implementation of the *Getting Climate-Ready* guide and other questions of interest to UNESCO through an online survey programmed into Survey Monkey. The pre-interview survey included:

1. An open-ended question to collect a story about a climate action practice at their school.
2. Overall ratings of the school's climate action practices on a scale of 0-10 in each of the four whole school domains (governance, teaching and learning, facilities and operations, and community partnerships). Participants were also asked to provide specific practice examples within each of the domains.
3. Two open-ended questions drivers and barriers encountered in implementing climate action in the school.
4. A variety of questions exploring implementation of climate action activities recommended by the *Getting Climate-Ready* guide in four sections:
   a. Governance, which formed the bulk of the questionnaire and explored activities related to planning for climate action at the school level
   b. Teaching and Learning, which examined uptake of climate action in curriculum; the types of skills taught in climate change related curriculum; and whether climate change education was considering socio-emotional aspects associated with good practices
   c. Facilities and Operations, which examined the ways in which school buildings and grounds were being modified to act as models of climate action
   d. Community Partnerships, which explored the extent and types of climate change education activities occurring in partnership with the broader community

Participants were also provided with five upload fields to allow them to share photos of climate action practices taking place in their school.

Semi-Structured Interviews

The semi-structured interviews explored the pilot schools' stories of promising climate action practices in greater depth than the survey. In the interview, participants:

1. Discussed their pre-interview climate action practice story in greater detail through a series of prompts.
2. Reviewed the ratings and examples the participant provided in their pre-interview survey within each of the four whole school domains.
3. Explored facilitators, challenges, and outcomes in relation to implementation of the *Getting Climate-Ready* guide.

Biodiversity Workshop at Académie des Sacrés-Cœurs

Non-Pilot Project Schools

Data were also collected from non-pilot participant schools through an online survey to allow comparison and further exploration of good and good practices taking place in Canadian ASPnet schools that were not participating in the pilot project. Non-pilot schools did not receive the *Getting Climate-Ready* guide and represent a baseline of climate action likely taking place in ASPnet schools in the absence of the pilot project.

Non-pilot schools completed a survey questionnaire comprised the same core group of questions as the pre-interview survey described above, but without questions pertaining to the *Getting Climate-Ready* guide. The survey took 20-25 minutes to complete. To recruit this sample, the national coordinator emailed the participating schools introducing the evaluation and SEPN's researchers. SEPN then sent an initial recruitment email to all ASPnet facilitators in each school, using contact information provided by the national coordinator, with reminder emails being sent at one week intervals.

Students of Académie des Sacrés-Cœurs Selling Local Vegetables

DATA ANALYSIS

The collected data were analyzed through a whole school lens, with consideration to the *Getting Climate-Ready* guide. The results of the pilot project are not intended to be statistically relevant but, rather to give a sense of trends in uptake of climate action in relation to the *Getting Climate-Ready* guide.

Quantitative data analysis of the survey data included comparisons of pilot and non-pilot schools primarily via frequency distributions of the survey response options. In order to allow comparisons, percentages are provided in graphs; however, differences should be interpreted cautiously given small sample sizes.

In addition to frequency distributions, we calculated weighted averages for some questions that had 4-point likert-type response scales (where "not at all" was assigned a weight of 1, "some extent" assigned a weight of 2, "moderate extent" a weight of 3, and "large extent" a weight of 4). The resulting "index scores" have a potential range of 0 (no uptake) to 4 (maximum uptake) and allow for easier comparisons across multiple survey questions.

Qualitative data analysis involved inductive thematic analysis of stories and open-ended fields collected via the survey and interviews, to identify good practices as well as factors associated with successes and challenges. Key themes were developed with consideration to the *Getting Climate-Ready* guide as well as variables related to whole schools approaches.

Outdoor Class Day at Bruce Peninsula District School

Planting Trees at Bruce Peninsula District School

KEY FINDINGS

The section of the report provides an overview of key findings from the survey, with interview data included as appropriate for highlighting examples.

The report begins with an overview of the overall whole school domain ratings provided by survey participants and then key findings from each of the four whole school domains of governance, teaching and learning, facilities and operations, and community partnerships. Good practices in each area are raised throughout and the key findings are discussed in relation to good practices based on the *Getting Climate-Ready* guide as well as the research literature.

One promising practice from a school that participated in the evaluation is highlighted in greater detail at the end of each domain section. The climate action stories captured by the interview data are included in the document, "Ten Canadian Schools' Stories of Climate Action: A Collection of Promising Practices from the 'Getting Climate-Ready' Pilot Project," which is a companion to this data-driven report. The report may be found on the CCUNESCO and SEPN websites.

The report concludes by discussing common drivers and barriers encountered by schools when implementing their climate action projects. We also provide recommendations and next steps based on the literature and findings.

PARTICIPATING SITES

We received complete surveys from 10 pilot schools and 14 non-pilot schools. An additional three non-pilot schools did not complete the entire survey but did provide high quality responses to the questions about the "climate action story" and so were included in those portions of the analysis.

Eight of the pilot schools were located in the province of Québec, one in Saskatchewan, and one in Ontario. Eight of the pilot schools were Francophone, and two were Anglophone. Three of the schools were rural and seven located in urban areas. Two of the pilot schools were primary schools, three were Kindergarten to Grade 12, and five were secondary schools.

Fifteen non-pilot schools provided information about their location; of those, four were based in Alberta; three in Manitoba; two in each of British Columbia, Ontario, and Québec; and one in each of New Brunswick and Saskatchewan. Six were Francophone and nine were Anglophone. The majority (10 schools) were located in urban areas, with 5 being located in rural areas. Finally, five schools were elementary, three were primary to middle schools, three were Kindergarten to Grade 12, and four were secondary schools.

All pilot schools were undertaking climate action projects at the time of the evaluation and, as shown in Figure 1 below, most projects were in place prior to the pilot. Most of the pilot schools found the *Getting Climate-Ready* guide at least somewhat useful for implementing climate action across the four whole school domains (Figure 2). The majority of the pilot school facilitators we interviewed indicated the guide was used as a starting point during the pilot to further develop their existing climate action projects.

Hafford Central School Plants Trees at Their Local Waste Management Site
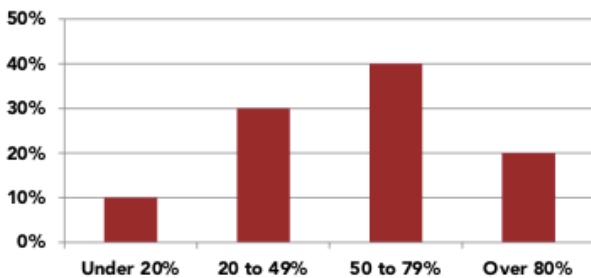
Figure 2. Percentage of Climate Action Projects in Pilot Schools Prior to Participating in Getting Climate-Ready Pilot (n=10)
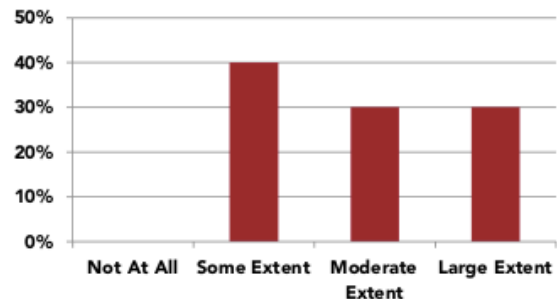
Figure 2. Pilot School Ratings of Usefulness of Getting Climate-Ready Guide in Implementing Pilot Projects (n=10)

While the sample sizes are small, the survey results provide insights into the overall trends in uptake of the different components recommended by the *Getting Climate-Ready* guide amongst ASPnet schools participating in the pilot project, relative to those that were not participating. The findings provide a starting point to identify preliminary promising and good practices in climate change education, and contribute not only to the Canadian Commission for UNESCO (CCUNESCO) and UNESCO's abilities to evaluate climate change education, but also to an emerging field of research.

CLIMATE ACTION IN WHOLE SCHOOL DOMAINS: OVERALL RATINGS

Participants were asked to give an overall rating for climate action in each whole school domains where 0 meant no or few climate action practices were occurring in that domain, and 10 meant many climate action practices were taking place.

These ratings provide the opportunity to compare participants' perceptions of climate action across all four whole school domains, including providing insights into the overall impacts of the *Getting Climate-Ready* guide in facilitating climate action in the pilot schools since the non-pilot schools did not receive the support of the UNESCO climate action pilot project.

As shown in Figure 3 below, there were relatively large differences between the average overall ratings of pilot and non-pilot schools in several of the domains:

PILOT SCHOOLS[*]
(n=10)

NON-PILOT SCHOOLS[*]
(n=14)

*CLIMATE ACTION UPTAKE RATINGS KEY

0-2 - Little to no uptake	6-8 - High levels of uptake
3-5 - Medium levels of uptake	9-10 - Very high uptake
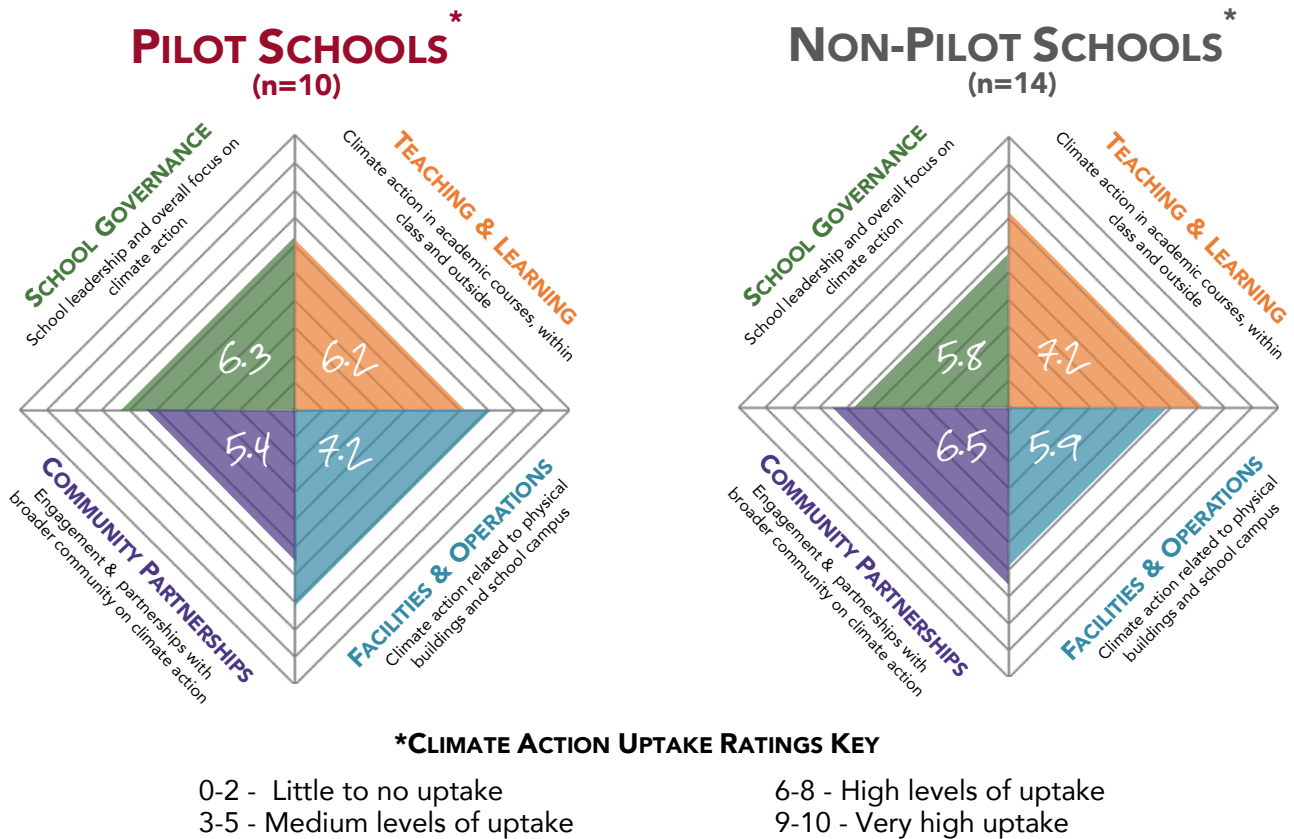
Figure 3. Overall Ratings of Climate Action in Each Whole School Domain

TRENDS IN OVERALL RATINGS OF CLIMATE ACTION

Pilot schools' ratings were higher than non-pilot schools in the domains of Governance and Facilities and Operations, and lower than non-pilot schools in Teaching and Learning and Community Partnerships:

Governance	• Pilot schools rated this domain 0.5 points higher than non-pilot schools (6.3 points out of 10 for pilot schools compared to 5.8 points out of 10 for non-pilot schools) • Governance was the lowest-scoring domain for non-pilot schools
Teaching and Learning	• This was the highest-scoring domain for non-pilot schools, with an average score of 7.2/10 • The average rating for pilot schools, with an average score of 6.2/10, was lower than the non-pilot schools' ratings
Facilities and Operations	• Pilot schools rated this domain the highest, with an average score of 7.2/10, compared to a lower score of 5.9/10 for non-pilot schools
Community Partnerships	• This was lowest-scoring domain for pilot schools, with an average rating of 5.4/10, and compared to an average score of 6.5 for non-pilot schools

While the sample sizes are small, the results suggest the *Getting Climate-Ready* guide was particularly useful in encouraging uptake of governance and facilities-related initiatives in the pilot project schools.

Importantly, as we describe below, these overall ratings do not necessarily reflect the relative quality of climate action initiatives in the pilot and non-pilot schools, and it is possible that the very act of participating in the project made the pilot schools more critical of their climate action initiatives as much can be done to undertake meaningful climate action.

CLIMATE ACTION STORIES: GOOD PRACTICES IN CANADA'S ASPNET SCHOOLS

Participants were asked to describe the most exciting climate action initiative currently taking place in their schools. The tables below briefly summarize the different climate action projects being implemented in both pilot and non-pilot schools. For more detailed descriptions, please go to Appendix A.

GOVERNANCE

- Environmental committees raised awareness about environmental issues
- Student committee members researched environmental topics then educated other students and teachers
- Sustainability and climate change incorporated into school policies
- Reusable water bottle procurement initiated to circumvent cafeteria company refusal to sell single use water bottles
- Environmental awareness campaigns for students and staff conducted
- Funding partnerships established to apply for grants to support initiatives
- Funding provided to students to implement interdisciplinary research projects to improve school or community sustainability

TEACHING & LEARNING

- ESD integrated across entire curriculum
- School-wide challenges to reduce climate change
- Entire school made collage out of recycled materials to celebrate Earth day
- Classroom- and school-level projects on climate change developed
- Learning extended to outside the classroom through community partnerships
- Students learned about Indigenous cultures, the environment, and climate change
- Students researched local actions for reducing community's impact in relation to climate change
- Workshops held on sustainability and climate change topics

COMMUNITY PARTNERSHIPS

- Website developed to track school's whole school approach
- Website developed to support monthly climate change challenges for students
- Students taught about sustainable entrepreneurship and marketing through operating a greenhouse
- Students learned about reducing emissions then taught others, including their families, about eco-friendly lifestyles
- Students earned "educational carbon credits" through Scol'ère Carbon Exchange Program
- Students collaborated with partner, Super Recyclers, to collect items to resell or recycle. Money raised paid for classroom workshops on sustainability
- School garden cared for in collaboration with community partner
- School collaboration with partner, Recycle Everywhere, supported across school division

FACILITIES & OPERATIONS

- Industrial composter installed and compost given to other schools and teachers or used to enrich school garden's soil
- Students, teachers, board members, staff and spouses worked from home for Carbon Neutral Day, during which data were collected on transportation use
- Students taught proper waste sorting, including through a field trip to a local waste management site
- Students led recycling and compost programs
- Solar panels installed
- Students cooked with local products in their cafeteria
- Carbon Reduction Challenge encouraged students to find more eco-friendly methods of transportation. Participants entered into a draw for a gift card

CLIMATE ACTION IN GOVERNANCE

Incorporating climate action into school governance is vital to developing a school culture of sustainability. Good climate governance can provide a focused framework for strategic implementation of climate action activities that take into account the school's strengths, and likely barriers. The *Getting Climate-Ready* guide includes several components of climate governance:

- Conducting a self-assessment of current climate actions
- Establishing climate action teams to plan and coordinate action across the school and avoid offloading responsibility onto just one or two members of the school
- Creating climate action plans with specific, measurable, attainable goals across all whole school domains
- Including climate action in various governance processes (e.g., school vision, strategic plan, procurement, budgets)

Key findings for this section of the survey are discussed below. Data for pilot schools (participated in the *Getting Climate-Ready* project) are represented in green throughout this section and non-pilot school data in grey. Because of its importance in fostering climate action in schools, both the guide and survey included a large focus on governance-related activities.

Bruce Peninsula District School Eco Team Completing a Waste Audit

Good Practices in Governance

Table 1 highlights many promising governance-related practices taking place in Canada's ASPnet schools identified through the evaluation, including **climate action uptake in policies, procurement, and funding schemes** as well as **committees to raise awareness** across entire schools. The initiatives often cross several whole school domains, demonstrating the power of climate action through governance.

Table 1. Good governance practices in pilot and non-pilot schools

SCHOOL	DOMAINS	INITIATIVE DESCRIPTION
Pilot Schools		
Collège Durocher Saint-Lambert	Governance Teaching & Learning	**Environmental committees** raise awareness about environmental issues. Student members research environmental topics with teacher support then visit classes to educate students and teachers.
Collège Sainte-Anne	Governance Facilities & Operations	**Sustainable Development Policy** led to Carbon Neutral Day. Twice/year for three years, about 2,000 students and 200 employees work from home. Everyone measures emissions reductions on that day.
École Secondaire La Poudrière	Governance Facilities & Operations	**Reusable water bottle procurement** for new students to circumvent cafeteria company sale of water bottles with awareness campaign for existing students staff.
Non-Pilot Schools		
Bairdmore School	Governance Teaching & Learning Facilities & Operations Community Partnerships	**Funding partnership with school's Advisory Council** to apply for grants to support an outdoor classroom, which encourages outdoor play and sustainable actions, such as growing vegetables and plants.
École Francophone d'Airdrie	Governance Teaching & Learning Community Partnerships	**Three-year school plan** led to creation of mini-UNESCO conference where students learn from each other and the community on an annual theme. The theme in 2018 was climate change.
Pickering College	Governance Teaching & Learning Facilities & Operations	One Grade 9 student **receives funding implement an interdisciplinary research project** to improve school or community sustainability. Grade 1 students are challenged with the goal of living waste-free.

Self-Assessment of Current Climate Actions

As shown in Figure 4, of the 10 pilot schools (left), 5 (50%) had conducted a self-assessment of current climate actions. A total of 4 of 14 (29%) non-pilot schools (right) had conducted a self-assessment. The results suggest that participating in the pilot study did encourage uptake of this particular good practice amongst pilot project schools.
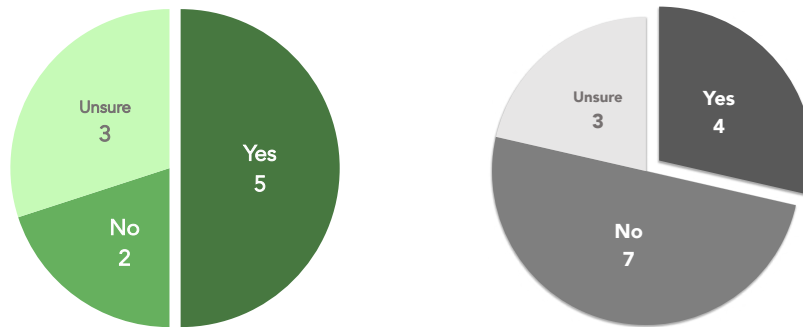
Figure 4. Proportion of Pilot (n=10) and Non-Pilot Schools (n=14) which had Conducted a Self-Assessment of Climate Actions

Climate Action Teams

As shown in Figure 5, pilot schools were approximately equally likely to have a climate action team compared to non-pilot schools. Specifically, 6 of the 10 pilot schools had a climate action team compared to 7 of 14 (50%) non-pilot schools, as shown below.
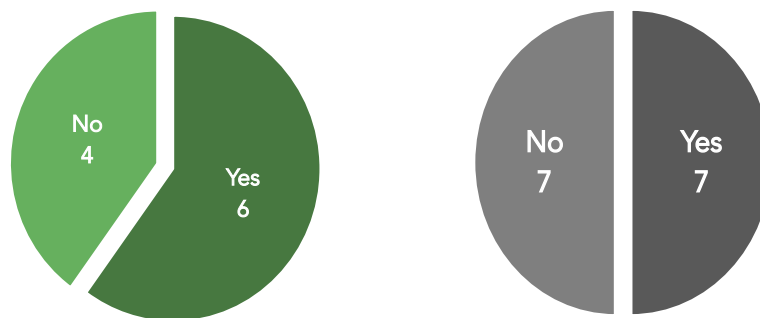
Figure 5. Proportion of Pilot (n=10) and Non-Pilot Schools (n=14) with Climate Action Teams

When asked about which types of representatives were on their climate action teams, **teachers** (5 of 6 pilot, all non-pilot schools), **students** (5 of 6 pilot, 6 of 7 non-pilot schools), as well as **principals and administrators** (5 of 6 pilot, 5 of 7 non-pilot schools) were most frequently represented. See Figure 6.

Other representatives included cafeteria, daycare, office, and special education staff; local community members and organizations; as well as environmental committee and club members.

Most participants indicated their school aimed for diversity (e.g., gender, background, grades, sexual orientation) in climate action team representatives. For example, half of pilot schools with climate action teams said their school aimed for diversity in climate action teams "to a large extent" and a third answered "to a moderate extent." Of non-pilot schools with climate action teams, 57% (4 of 7) aimed for diversity in their climate action team representatives "to a large extent."

Figure 6. Word Cloud of Climate Action Team Representative Types in Pilot (n=6) and Non-Pilot Schools (n=7)

Climate Action Plans

Most schools in the evaluation had not carried out steps recommended by the *Getting Climate-Ready* guide to support climate action in governance. These activities can be valuable stepping stones to the development of more formal climate action plans in that they can be used to plan specific actionable goals, activities, and timelines schools can take to become more climate friendly. Specifically, as shown in Figure 7, most schools had not developed:

- A **definition of what climate action meant** to their school (1 pilot, 3 non-pilot schools);
- A **brainstormed list** of things that made their school unsustainable (2 pilot, 5 non-pilot schools); or
- A **vision, mission, or values statement on climate action** (1-2 pilot, 1-2 non-pilot schools).

As shown in the pie charts in Figure 7, only 3 of 10 pilot schools and 4 of 14 non-pilot schools (29%) had developed a climate action plan. Although the sample sizes are small, this suggests that participating in the pilot did not encourage pilot schools to develop a climate action plan.

However, amongst schools with a climate action plan, many included key components to facilitate **achieving climate action goals**, including:

- Objectives and priorities around climate action (4 pilot, 1 non-pilot schools);
- Specific tasks, outcomes, and timeframes (3 pilot, 1 non-pilot schools);
- Reflection time to consider progress towards goals; and

In addition, most of the schools with climate action plans included **data collection to capture change**:

- Student-led investigations (3 pilot, 3 non-pilot schools);
- Collecting ongoing operational data (3 pilot, 2 non-pilot schools); and
- Qualitative data such as student work, lesson plans, and photographs (1 pilot, 2 non-pilot schools)

Finally, as shown in the last table in Figure 7, schools with climate action plans were asked about integration of climate action into governance processes as part of their climate action plan. **Most schools with climate action plans did include climate action in orientation and purchasing policies**, and there was a trend towards incorporating climate action into school budgets and committee work. Few schools included climate action into strategic plans, general policies and procedures, or code of conduct although the sample sizes are too small to draw strong conclusions.

10 Pilot Schools   **14** Non-Pilot Schools

Number of Schools that had Developed:

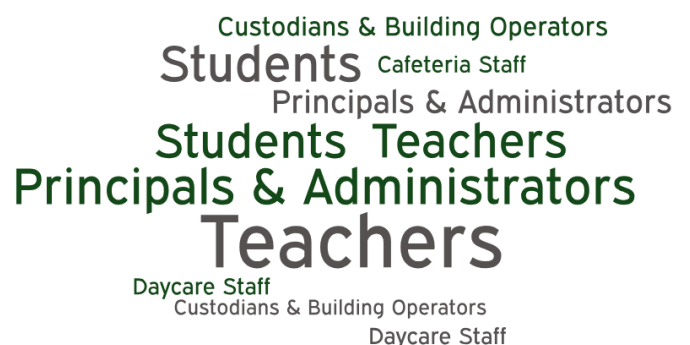| Pilot		Non-Pilot
3	None of the above	5
2	Values statement	2
1	Brainstormed list of things that make school unsustainable	5
1	School definition of climate action	3
1	Mission statement	1
1	Vision statement	0

Has Your School Developed a Climate Action Plan?

Pilot: 6 No, 3 Yes, 1 Unsure
Non-Pilot: 9 No, 4 Yes, 1 Unsure

4 Pilot Schools   **5** Non-Pilot Schools

Number of Schools Whose Climate Action Plans Included:

Pilot		Non-Pilot
4	School's objectives and priorities	1
3	Specific tasks, outcomes, and timeframes	2
3	Reflection time to consider progress towards goals	3
2	Procedures for monitoring goal achievement	2

Number of Schools Whose Climate Action Plan Included Data Collection to Capture Change:

Pilot		Non-Pilot
3	Student-led investigations	3
3	Collection of quantitative data as part of ongoing operations	2
1	Qualitative data (e.g., student work, lesson plans, photographs, newsletters)	2

Number of Schools that had Integrated Climate Action into:

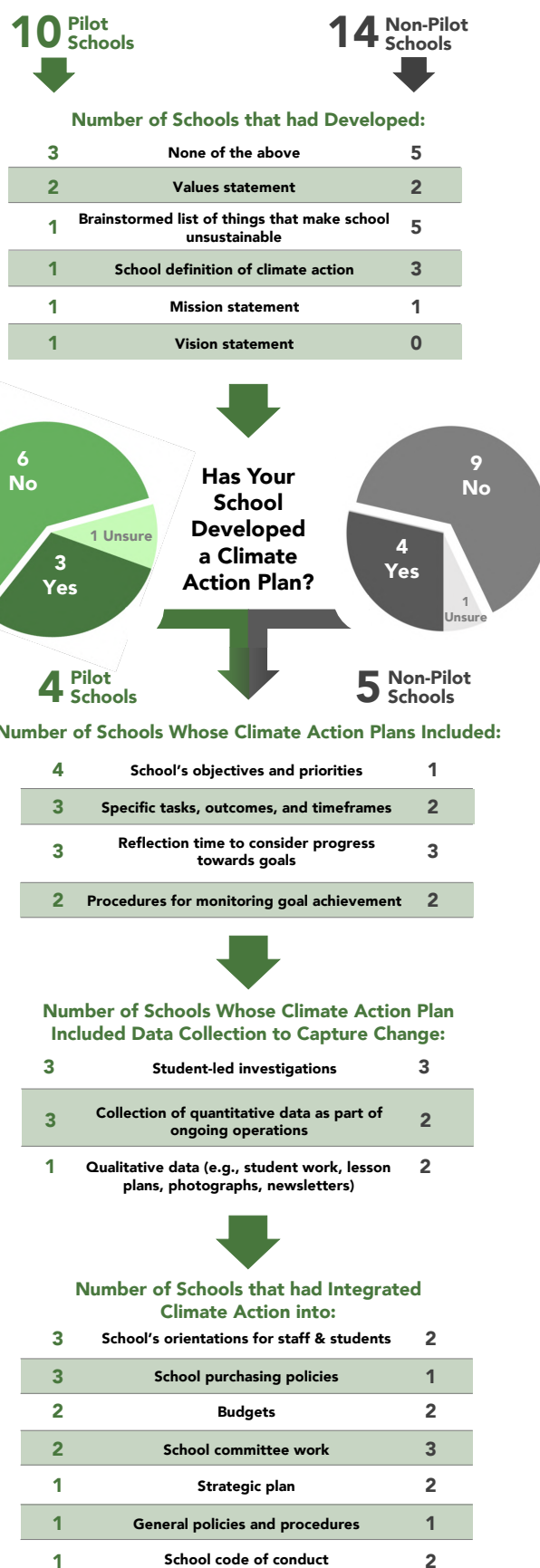| Pilot		Non-Pilot
3	School's orientations for staff & students	2
3	School purchasing policies	1
2	Budgets	2
2	School committee work	3
1	Strategic plan	2
1	General policies and procedures	1
1	School code of conduct	2

Figure 7. Pilot and Non-Pilot School Integration of Climate Action into Governance

WHOLE SCHOOL DOMAIN INCLUSION IN CLIMATE ACTION PLANS

SCHOOL GOVERNANCE	**3 (75%) Pilot Schools** **3 (60%) Non-Pilot Schools**
TEACHING & LEARNING	**3 (75%) Pilot Schools** **4 (80%) Non-Pilot Schools**
FACILITIES & OPERATIONS	**4 (100%) Pilot Schools** **3 (60%) Non-Pilot Schools**
COMMUNITY PARTNERSHIPS	**2 (50%) Pilot Schools** **4 (80%) Non-Pilot Schools**

Figure 8. Integration of Whole School Domains into Climate Action Plans

Finally, when asked about whole school domain representation in their climate action plans, all four pilot schools with climate action plans said their plan focused on facilities and operations. Three pilot schools' climate action plans addressed governance; three included teaching and learning components; and two plans included community partnerships.

Whole school domain engagement in non-pilot schools' climate action plans was similar to that of pilot schools; however, pilot schools were more likely to have facilities and operations in their plans whereas non-pilot schools were more likely to include community partnerships.

SPOTLIGHT: STUDENT-LED CLIMATE CHANGE COMMITTEES

Collège Durocher Saint-Lambert

At Collège Durocher Saint-Lambert, student committees have taken the lead on educating the student body about climate action. Two student committees at the school, consisting of about 10-12 students each, have been dedicated to environmental issues.

Student committee members researched climate issues with a teacher's support then visited all classes to share their knowledge. In the 2017-2018 school year, student committees focused on issues such as recycling, composting, and the environmental benefits of vegan diets due to reduced consumption of red meat. The school has two buildings, so they had one environmental committee for each building to ensure all students received their messaging.

When educating other students, committee members used a variety of techniques. Those that were particularly successful included awareness booths, simulation games, and a blog with entries about various activities at the school (https://cdslunesco.wordpress.com). The entire student community benefited from the committee members' research. Additionally, students developed a stronger sense of inquiry as they investigated different issues and became better at expressing their ideas about climate action and convincing others of their viewpoints.

The actions of these student committees were also supported by other governance-related climate action practices at the school. For example, the school's purchasing policy promoted the purchasing of sustainable products such as those that are fair trade and local, including clothing. Climate actions at Collège Durocher Saint-Lambert have also been supported

Student Committee Members Raising Awareness of Climate Issues

due to their existing designation as an École Vert Brundtland (EVB) school. Overall, the student-led committees have had a positive impact at Collège Durocher Saint-Lambert and have helped foster a culture of sustainability at the school where it has become a reflex to say, "we are a green school."

CLIMATE ACTION IN TEACHING & LEARNING

Teaching and learning is the core task of schools. As a result, the *Getting Climate-Ready* guide recommends embedding climate action across the entire curriculum. Climate action provides the opportunity to teach a variety of critical, creative, and futures-thinking skills and as discussed above, the literature recommends educators consider socio-emotional factors to better empower and equip students to tackle climate change (Monroe et al., 2017; Ojala, 2015). This section outlines key findings in relation to uptake of climate action in teaching and learning. Pilot school data (participated in the *Getting Climate-Ready* pilot project) are in orange in this section whereas non-pilot school data are in grey.

Students Work in the Greenhouse at Collège Bourget

Good Practices in Teaching & Learning

The table below summarizes the different climate action initiatives described by the schools participating in the evaluation. Non-pilot schools were more likely than pilot schools to focus on teaching and learning in their climate action stories. Good practices identified by the evaluation include **integrating sustainability and climate change education across all school subjects**; **classroom-based climate change challenges** taking place across entire schools; and **research projects** where students identify potential local solutions to impact climate change. Appendix A provides more detail on these exciting initiatives.

Table 2. Good teaching and learning practices in pilot and non-pilot schools

SCHOOL	DOMAINS	INITIATIVE DESCRIPTION
Pilot Schools		
Académie des Sacrés-Coeurs	Teaching & Learning Community Partnerships	School offered 10 **sustainability/climate change challenges**; each teacher was able to create their own projects to address challenges. Project was paired with existing biodiversity workshops and Scol'ère Carbon Exchange Program.
Non-Pilot Schools		
Collège Beaubois	Teaching & Learning	Several teachers include **climate action in their classes** through a variety of activities including debates. Students at all levels learn about Indigenous cultures, the environment, and climate change.
École Beausejour Early Years	Teaching & Learning Facilities & Operations	**Climate action programs are offered in all grades**. They also have battery recycling, compost, and recycling programs, all of which are led by students.
Queen Elizabeth High School	Teaching & Learning Community Partnerships	**ESD integrated across the entire curriculum** and all classes must include ESD at some point. This initiative is further supported by many community partnerships which extend learning outside the classroom.
Trafalgar Elementary School	Teaching & Learning Facilities & Operations	Several **classroom and school level projects on climate change**. For example, students have built habitats for bees and birds in their garden. The whole school has also been making an Earth collage out of recycled materials to celebrate Earth day.
Stephen Lewis Secondary School	Teaching & Learning	Students do **research projects to learn about local actions for reducing community's impact** in relation to climate change. Students invest their time and effort towards real world problems and solutions to impact their local environment and community.

Integration of Climate Change Education into All Subjects

Because climate change is such a complex topic, it transcends scientific, technological, and environmental knowledge bases. As a result, it is vital to incorporate climate change topics into all subjects, not just natural and social sciences.

When asked what percentage of school subjects incorporated climate change, **non-pilot schools were more likely to indicate greater integration of climate change in all subject areas than pilot schools**.

As displayed in Figure 9, 6 of 14 non-pilot schools (43%) said between 50-79% and 1 of 14 non-pilot schools said over 80% of subjects had incorporated climate change. By comparison, 3 pilot schools (33%) indicated that 50-79% of subjects had integrated climate change topics and none indicated integration of over 80%.
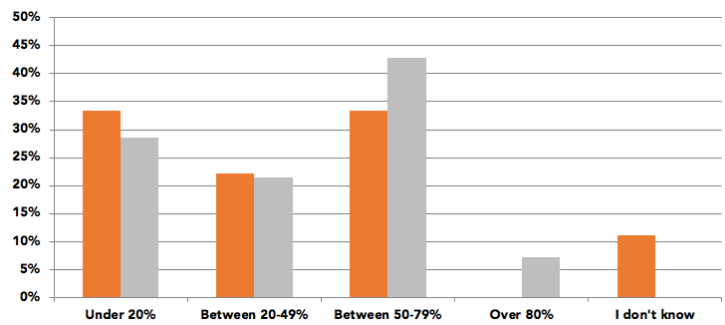
Figure 9. Percentage of Subjects Incorporating Climate Change in Pilot (n=9) and Non-Pilot Schools (n=14)

Figure 10. Word Cloud of Courses that Incorporated Climate Change in Pilot (n=10) and Non-Pilot Schools (n=14)

When asked which courses included a focus on climate change, the most common were **science and technology** (9 pilot, 13 non-pilot schools) and **geography** (7 pilot, 8 non-pilot schools). Many schools also indicated uptake of climate change topics into **language and literature** courses (6 pilot, 8 non-pilot schools) as well as **civics and citizenship** courses (4 pilot, 8 non-pilot schools).

Schools more rarely indicated uptake in mathematics, agriculture, health, physical education, and vocational and technical education courses suggesting room for growth in this area. See Figure 10.

Canada has a federated education system, which means that provinces and territories are responsible for developing curriculum. As a result, ministries and departments of education can play a key role in driving uptake of climate change education.

When asked the extent to which integration of climate change into course subjects was driven by provincial curriculum requirements, **the schools participating in the evaluation indicated provincial curriculum had made a relatively large contribution**. See Figure 11.

A total of five pilot and 4 non-pilot schools indicated integration was due to provincial curricula "to a large extent" and the distribution of responses was toward the "moderate" and "large" extent response categories, particularly in pilot schools.

Figure 11. Extent Integration of Climate Change was Due to Provincial Curriculum Requirements in Pilot (n=10) and Non-Pilot Schools (n=14

Teaching Complex Thinking Skills through Climate Change Education
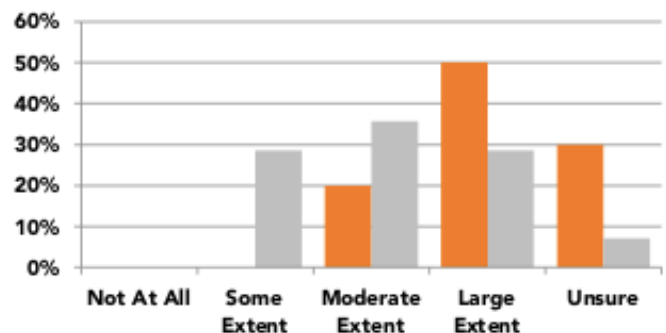
Children and youth today must be prepared to deal with a complex, unpredictable world. Climate change education provides opportunities to teach students critical, creative, and future thinking skills both inside and outside of the classroom.

Although all of the schools in the evaluation provided relatively high ratings for these survey questions, indicating **climate change education is being used to teach these important skills** although **future thinking skills scored the lowest indicating room for improvement**.
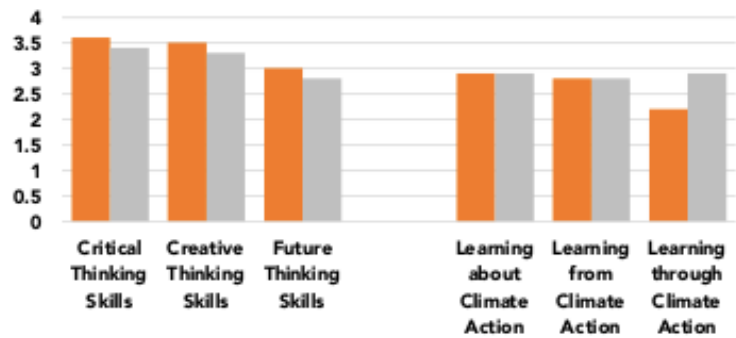

Figure 12. Types of Skills being Taught Through Climate Change Education in Pilot (n=10) and Non-Pilot Schools (n=14), Weighted Averages

As displayed in Figure 12, the weighted average index score ratings (maximum possible score of 4) were:
- **Critical thinking skills**: 3.6 out of 4 points for pilot schools, compared to 3.4 points for non-pilot schools
- **Creative thinking skills:** 3.5 for pilot schools compared to 3.3 for non-pilot schools
- **Future thinking skills:** 3.0 for pilot schools compared to 2.8 for non-pilot schools

We also asked evaluation participants about action-oriented learning taking place at their schools. These areas scored relatively low, with **all three action learning types—learning about, from, and through climate change—receiving average index scores below 3 points in both pilot and non-pilot schools**.

Social-Emotional Elements of Climate Change Education

Finally, the scholarly literature indicates that, in order for climate change education to be most effective, it must attend to a variety of factors that have been shown to reduce feelings of helplessness often experience as a result of learning about climate change (see for example, Kahan et al., 2012 Shome & Marx, 2009).

The components outlined in Figure 13 to the right were not recommended by the *Getting Climate-Ready* guide but were rather included in the survey due to recommendations from emerging literature on climate change education (Monroe et al., 2017; Ojala, 2015).

The results shown in Figure 13 suggest that climate change education approaches being adopted by schools are beginning to attend to these factors although there is room for improvement. In particular, survey respondents indicated climate change education was **empowering students to take action** (index scores of 3.1 for pilot, 2.6 for non-pilot schools); **providing students with opportunities to design and implement climate action projects** (3.0 for pilot, 2.9 for non-pilot); and **ensuring the information presented in class is personally relevant and meaningful** (3.0 for pilot, 2.9 for non-pilot).
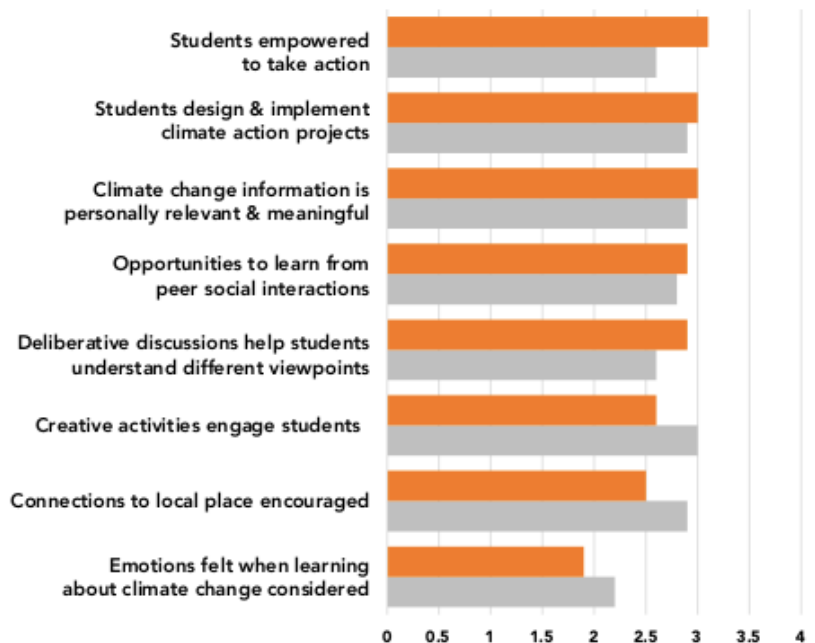

Figure 13. Integration of Socio-Emotional Components into Climate Change Education in Pilot (n=10) and Non-Pilot Schools (n=14), Weighted Averages

Spotlight: ESD in All School Subjects

Queen Elizabeth High School

No matter which class you take at Queen Elizabeth High School, you will learn about Education for Sustainable Development (ESD) and climate action. Throughout the school, ESD has been designated a key theme of study, which means all subjects must focus on ESD at some point in the year. This integration of ESD into the curriculum provides students with a variety of opportunities to learn about climate change inside and outside the school.

At Queen Elizabeth High School, ESD is included in the formal curriculum within Science and Social Studies classes in various ways. For example, beginning this year, all Grade 10 Science students will complete a research project on climate issues based on their own interests. In addition, ESD is reinforced across all other subjects. While teachers must incorporate ESD themes in their classes at some point during the year, they are given the flexibility to decide how ESD is included. For instance, within English classes, students may be shown a visual stimulus about a climate disaster as a prompt about which to write. Within art classes, students often make 'Resistance Art' around climate change themes.

While ESD is incorporated across subjects, a lack of easy to understand resources for teachers without a science background as well as a lack of expansion beyond a scientific lens has presented somewhat of a challenge when integrating ESD within all subjects. Allowing teachers to explore ESD themes creatively and within their own disciplines, however, has led to richer understandings for students. Not only do students intellectually understand climate change, but they are also taught how to respond ethically and emotionally. This initiative is driven by open-minded staff who are willing to work across disciplines and is supported by their community partnerships.

Students who are particularly passionate about climate action also have the opportunity to work closely with the school's community partners. Interested students can participate in policy development, dialogue, and promotion related to climate action through their Global Citizenship programming. The

Centre for Global Education operates out of Queen Elizabeth High School and facilitates national and international video conferencing and partnerships with organizations such as the Intergovernmental Panel on Climate Change (IPCC), the 23rd Conference of the Parties to the United Nations Framework Convention on Climate Change (COP23), and Oceanwise. These partnerships allow students to present policy papers at COP23 and IPCC Climate Change Conferences.

In addition, the Innovate program focuses on sustainability education, green technology, and partnerships with industry leaders to support innovative sustainable solutions. Students participating in this program pursue green action projects through an extracurricular course and club where they get credits for participating in projects, including individual climate action projects. Students interested in green careers also have the opportunity to collaborate with green industry leaders as part of this programming.

The extensive integration of ESD into curriculum at Queen Elizabeth High School provides students with multiple opportunities to learn about climate action within their courses as well as through climate action within the community.

Students at Queen Elizabeth High School Resist Through Art

CLIMATE ACTION THROUGH FACILITIES & OPERATIONS

Facilities and operations initiatives such as upgrading buildings, sustainable renovations, recycling, composting, and school gardens are often the earliest and the most common sustainability-related initiatives in schools (Beveridge et al., in press; UNESCO, 2016). These initiatives directly reduce schools' emissions and often represent "easy wins" for schools embarking on their journey to become more sustainable. The *Getting Climate-Ready* guide outlines many ways schools can go further to become models of climate action, such as improving biodiversity, health and well-being. Pilot participant data (schools participating in the *Getting Climate-Ready* project) are in blue in this section, whereas non-pilot school data (i.e., did not receive the guide) are in grey.

Good Practices in Facilities & Operations

The evaluation identified several ways in which ASPnet schools are reducing their carbon footprints, for example, schools were **composting, waste sorting, recycling, solar panels, using local products, and tree planting**. Several schools had more 'out of the box' initiatives including **Carbon Neutral Day**, during which the school community works remotely. Another school was doing **Carbon Reduction Challenges** to encourage eco-friendly transportation. See Table 3.

Monitoring the Compost Station at École Secondaire Cavelier-De LaSalle

Table 3. Good facilities and operations practices in pilot and non-pilot schools

SCHOOL	DOMAINS	INITIATIVE DESCRIPTION
Pilot Schools		
Cavalier-de LaSalle	Facilities & Operations Community Partnerships	An **industrial composter** installed at the school reduce waste. The school gave away 170 kg of compost to other elementary schools and teachers for their gardens.
Collège Regina Assumpta	Teaching & Learning Facilities & Operations	Students, teachers, board members, staff and spouses worked from home in **Carbon Neutral Day**. Data collected on school community's transportation use will be used to reduce their footprint.
Hafford Central School	Facilities & Operations Community Partnerships	Students taught proper **waste sorting**, including via a field trip to a local waste management site. Recycling program run by students and school partnered with the waste management site to **plant trees**.
Non-Pilot Schools		
Bethlehem Catholic High School	Teaching & Learning Facilities & Operations	The school plans on installing **solar panels**, which had been approved by the school board. They were seeking funding for implementation. **Students did most of the research** with the support of several teachers.
École Blanche-Bourgeois	Teaching & Learning Facilities & Operations	Students are taught how to **cook with local products**, eat healthy lunches, and about the benefits of using local products. The school has a **composting system** and they use the compost to enrich the soil of their school garden.
Niton Central School	Teaching & Learning Facilities & Operations	Each week, **students collect recyclable materials** from each classroom and learn about what it means to recycle and how to protect the environment.
Sa-Hali Secondary	Facilities & Operations	**Carbon Reduction Challenge** challenges students to find **eco-friendly methods of transportation** to school. Participants get stamps on a card and the highest number of points are entered into a draw for a gift card.

Most Innovative Practices

Participants were asked an open-ended question about what their most innovative facilities and operation practice was. Many of the examples received were focused on **waste reduction** and **energy efficiency** initiatives. Additional examples of innovative practices included:

- **Zero waste snacks**
- **Vegetarian lunches**
- **Simply Living Simply,** described below in the Community Partnerships section (p. 23)

Figure 14. Word Cloud of Most Innovative Facilities and Operations Practices in Pilot (n=10) and Non-Pilot Schools (n=14)

Figure 14 displays a word cloud representing the most innovative facilities and operations practices identified by the schools that answered the survey.

Finally, we examined a range of ways schools can become models of climate action through their facilities, as recommended by the *Getting Climate-Ready* guide. We calculated weighted average scores (maximum possible score of 4 points) for a series of questions examining the ways in which ASPnet schools were acting as models of climate action through their facilities initiatives.

Figure 15 shows that, in general, pilot schools rated themselves higher than non-pilot schools on this section of the survey. In particular, pilot schools rated themselves quite high on **reducing energy consumption** (index score of 3.5 for pilot schools, which is quite a bit higher than 2.9 for non-pilot schools).

Schools also felt their facilities initiatives were helping to **promote health and well-being** (3.1 for pilot, 2.4 for non-pilot), reducing litter and waste (3.0 for pilot, 3.1 for non-pilot), **engaging in responsible consumption** (3.0 for pilot, 2.5 for non-pilot) and, **encouraging eco-transport** (3.0 for pilot, 2.4 for non-pilot).
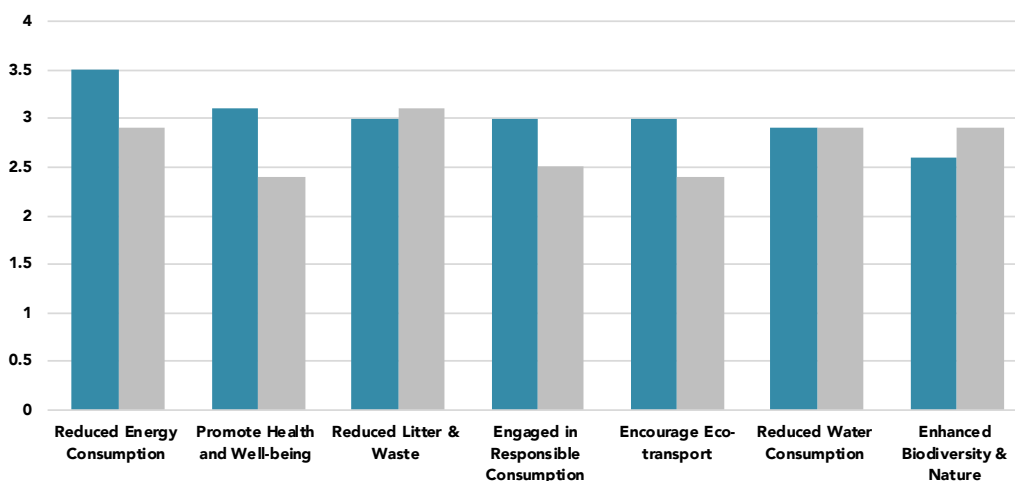

Figure 15. Ways in Which Pilot (n=10) and Non-Pilot Schools (n=14) Modeled Climate Action through Facilities, Weighted Averages

Spotlight: Carbon Neutral Day

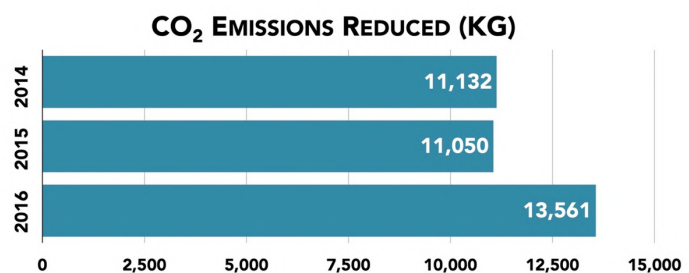**Collège Sainte-Anne & Collège Regina Assumpta**

Imagine arriving at school to find all the parking lots, hallways, and classrooms empty. You may have to check your calendar to make sure it's not the weekend!

This very thing happens at Collège Sainte-Anne and Collège Regina Assumpta as part of Carbon Neutral Day, when about 2,000 students and 100-200 teachers at each school work from home instead of coming to school. At Collège Regina Assumpta over 100 parents, school staff's families, and the Board of Directors also worked electronically for Carbon Neutral Day.

Collège Sainte-Anne has held Carbon Neutral Day twice per year for the last three years. Collège Regina Assumpta held their Carbon Neutral Day for the first time this year after being inspired by Collège Sainte-Anne.

As part of Carbon Neutral Day, the schools collected information to help them figure out how to reduce their schools' greenhouse gas emissions. For example, Collège Regina Assumpta looked at the types of transportation used most often by members of their school community and found out that teaching staff often drive to school by themselves. The school plans to use this information to encourage carpooling and public transit.

At Collège Sainte-Anne, everyone takes a survey to measure their ecological footprint, which has allowed them to track reductions in their carbon dioxide emissions of 11,132 kg in 2014, 11,050 kg in 2015, and 13,561 kg in 2016. Students participating in Carbon Neutral Day at Collège Sainte-Anne are also given challenges to complete. This year's challenge was to create a video about reducing greenhouse gas emissions and taking care of the environment. Some students made videos showing themselves reducing electricity use in their house, picking up trash, saving water, and eating vegetarian meals.

CO$_2$ Emissions Reduced (KG)

Year	
2014	11,132
2015	11,050
2016	13,561

(0   2,500   5,000   7,500   10,000   12,500   15,000)

Tracking Carbon Emissions Reductions at Collège Sainte-Anne

The monumental task of relocating an entire school for a day did not come without a few challenges along the way. Major obstacles at Collège Regina Assumpta were related to the logistical management of staff and loss of income for the cafeteria. For example, they had to decide which staff would come in and who would be paid. Most staff were able to work from home, except for the maintenance workers.

Empty Halls at Collège Regina Assumpta on Zero Emissions Day

Collège Sainte-Anne had technical challenges associated with adapting their network and web platforms to allow everyone to work at home. On Collège Sainte-Anne's first Carbon Neutral Day, they also gave students too much work to finish in one day. Since then, students have slept over at friends' houses the night before and worked in teams.

At both Collège Sainte-Anne and Collège Regina Assumpta, Carbon Neutral Day has provided the opportunity to illustrate how transportation choices directly translate into emissions reductions and helped figure out ways to reduce school emissions. Overall, Carbon Neutral Day encouraged school commu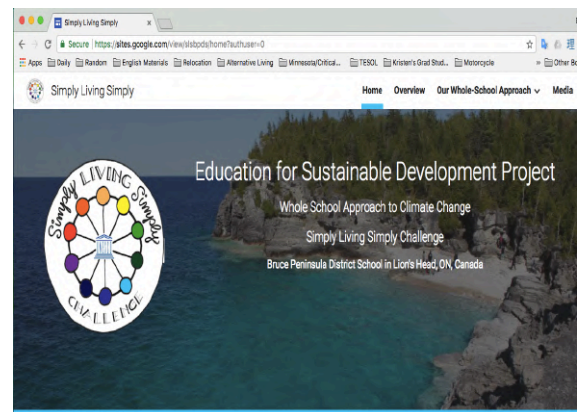nities to reflect on how they can reduce their greenhouse gas emissions. Carbon Neutral Day was a success at both schools and a beautiful example of how schools can collaborate together in the spirit of climate action!

PARTNERING WITH THE COMMUNITY ON CLIMATE ACTION

While school-based climate action initiatives hold promise for having an impact on climate change, climate solutions must extend to the entire community if we are to create true, lasting change (UNESCO, 2016) because climate change is due to systemic, large-scale issues (e.g., Gonzalez-Gaudiano & Meira-Cartea, 2010). Community partnerships also extend learning opportunities outside of the classroom in many ways. Results from schools that participated in the *Getting Climate-Ready* pilot (i.e., pilot schools) in this section are represented in purple and contrasted to non-pilot school data in grey.

One of Bruce Peninsula District School's "Simply Living Simply" Websites

Good Practices in Community Partnerships

As shown in Table 4, the ASPnet schools that participated in the evaluation were involved a variety of innovative climate action community partnerships. Several schools **partnered with community organizations to reduce emissions** and **recycle** in interesting ways, including a **reselling program that uses the proceeds to bring in organizations for workshops on sustainability topics**. Another school's **greenhouse** was being used to teach **entrepreneurship and marketing skills** through a sustainable development perspective. Finally, Bruce Peninsula District School**'s Simply Living Simply initiative** has two **websites focusing on their whole school approach**, including a website specifically for students to host content related to **sustainability challenges**.

Table 4. Good community partnership practices in pilot and non-pilot schools

| SCHOOL	DOMAINS	INITIATIVE DESCRIPTION
Pilot Schools		
Bruce Peninsula District School	Teaching & Learning Community Partnerships	Includes two websites developed for the "**Simply Living Simply**" program. One describes their whole school approach and the other is built around monthly climate change challenges for students.
Collège Bourget	Teaching & Learning Facilities & Operations Community Partnerships	Students learn **entrepreneurship and marketing through a sustainable development lens** through operating a greenhouse which produces vegetables and herbs. Students are involved at all stages of production.
École des Amis-du-Monde	Teaching & Learning Community Partnerships	Students **learn about reducing emissions then teach others** about eco-friendly lifestyles, including their families. Students earn "educational carbon credits" through Scol'ère Carbon Exchange Program, which organizations buy to offset their emissions.
Non-Pilot Schools		
École Émile-Nelligan	Facilities & Operations Community Partnerships	**In collaboration with partner, Super Recyclers,** students collect used or damaged items to resell or recycle. The money is donated to organizations such as Oxfam QC for classroom workshops on similar topics.
École La Source	Facilities & Operations Community Partnerships	**A school garden** cared for by teachers and students in **collaboration with a community partner**. Plants will be transferred from school to community garden.
École Tuxedo Park	Facilities & Operations Community Partnerships	The school works **collaboratively with Recycle Everywhere** to recycle everything they can; this initiative is supported across their school division. A water bottle refill station in the school tallies the number of bottles prevented from being dumped.
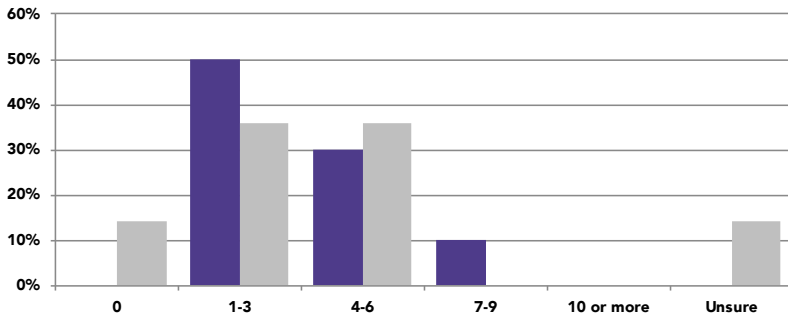
Figure 16. Number of Formal Community Partnerships Related to Climate Action in Pilot (n=10) and Non-Pilot Schools (n=14)

Many of the schools had several formal community partnerships at the time of the evaluation, as illustrated in Figure 16.

Three of the 10 pilot schools and 5 of the 14 non-pilot schools had 3-6 partnerships and 1 pilot school had 7-9 formal community partnerships.

The in the evaluation schools were also collaborating with a variety of stakeholders outside their school. The word cloud in Figure 17 shows that the **most frequent collaborators** were:

- **Families** (7 pilot, 8 non-pilot schools)
- **Other schools** (5 pilot, 4 non-pilot schools)
- **National and international networks** (5 pilot, 7 non-pilot schools)
- **Local government** officials and agencies (4 pilot, 5 non-pilot schools)
- **Local environmental groups** (4 pilot, 6 non-pilot schools)
- **Local businesses** (4 pilot, 7 non-pilot schools)

Figure 17. Word Cloud of Stakeholder Types in Pilot Schools (n=10) and Non-Pilot Schools (n=14)
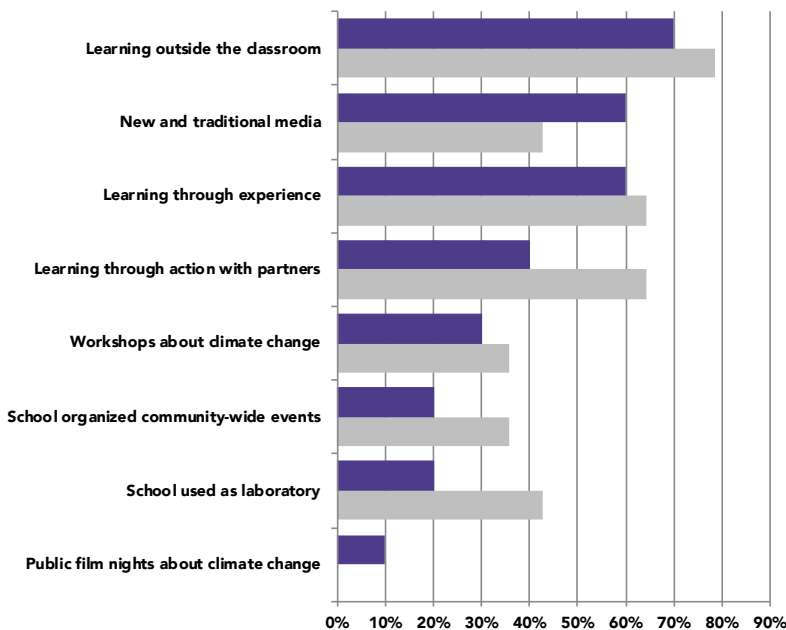
Figure 18. Types of Partnership Activities Related to Climate Action in Pilot (n=10) and Non-Pilot Schools (n=14)

Finally, when asked about the ways in which their school partners with the community, schools were most frequently using partnerships to learn:

- **Outside the classroom** (7 pilot, 11 non-pilot schools)
- Through **new and traditional media** (6 pilot, 6 non-pilot schools)
- **Through experience** such as via cooperative and community service learning programs (6 pilot, 9 non-pilot schools)

Non-pilot schools were much more likely than pilot schools to indicate their students were **learning through action with partners** (3 pilot, 5 non-pilot schools) and using the school as a laboratory (2 pilot, 6 non-pilot schools). See Figure 18.

Spotlight: Simply Living Simply

Bruce Peninsula District School

Are you wondering how your school can implement a whole school approach to climate action? Bruce Peninsula District School's "Simply Living Simply" program has made it very 'simple' to understand.

The "Simply Living Simply" program drives climate actions across all four whole school domains within the elementary school. One of the project's outcomes has been the creation of two ambitious websites. The Simply Living Simply website describes what a whole school approach to climate action looks like at Bruce Peninsula District school. You can scan the QR code or visit goo.gl/WPPBTJ to check out the website.

As part of the Simply Living Simply program, students also learn about a climate action challenge for a month (e.g., Go Local) and research online resources, which they share with the website coordinator to upload on a website specifically devoted to the challenge. You can check out the website, which includes the climate action challenges as well as ideas for how to tackle them at https://www.bpdslivessimply.org.

Because the school is located within a rural area with little school-provided technology and a spotty internet connection, maintaining two websites is sometimes difficult. As a result of these technology challenges, students are not able to use the websites during class time even though the website's content is based on what is done in the classroom.

Bruce Peninsula District School is well connected to the surrounding community through the Simply Living Simply program. For example, students participating in Simply Living Simply Challenges share their knowledge with the school and local community through the school's assemblies, Facebook page, and newsletter, as well as the community newspaper.

Local and community experts are also invited into classrooms as guest speakers at part of the project and community members visit the school to work with students to solve school problems related to climate change. For example, community experts joined students at two problem-solving sessions that identified ways to involve school and community members in summer garden maintenance as well as ways to encourage students to use compost buckets properly. Students also learn outside the classroom through cooperative learning experiences and action projects, such as garbage cleanups and tree planting days with local environmental groups and parks.

While Bruce Peninsula District School believes they have connected well with community members and organizations who are already environmentally-minded, their work is not yet done. Their next step is to engage more with the broader community to encourage climate action.

Through their websites as well as their relationships inside and outside of the classroom, Bruce Peninsula District School is engaging both school and public communities in climate action.

DRIVERS & BARRIERS TO CLIMATE ACTION

The evaluation is also helping us understand common kinds of drivers and barriers schools encounter when implementing climate action in their schools. This information can be used to develop strategies to overcome potential roadblocks when planning climate action initiatives.

The *Getting Climate-Ready* guide and the scholarly literature demonstrate that knowledge of climate change and climate change education are typically not sufficient for realizing a whole school approach to climate change education. Climate action in schools is most likely to be successful when there is administrative support, including from the school principal. Expertise inside and outside the school, for example, knowledgeable teachers as well as external experts, dedicated facilitators responsible for managing implementation of the approach; adequate teaching resources and materials; and sufficient financial support have also been shown to be helpful in fostering change (Australian Sustainable Schools Initiative, 2017; UNESCO, 2016).

When asked about the supports their school had received to integrate climate change, the most common supports were **committed school principals and administrators** (7 pilot, 10 non-pilot schools) and **time to plan** (6 pilot, 6 non-pilot schools).

Approximately half of the schools indicated they had **supporting materials and resources** (5 pilot, 5 non-pilot schools), **dedicated facilitators** to handle project implementation (5 pilot, 8 non-pilot schools), and sufficient financial resources (5 pilot, 5 non-pilot schools).

Schools' responses suggested they had **insufficient time to reflect on success** (this was particularly true for non-pilot schools) in addition to **not having access to experts** (particularly pilot schools). See Figure 19.
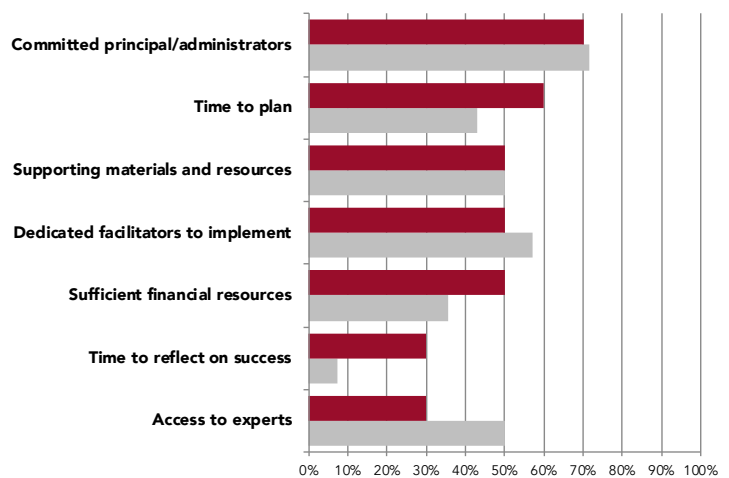
Figure 19. Support for Climate Change Integration in Pilot Schools (n=10) and Non-Pilot Schools (n=14)

Figure 20. Common Barriers to Climate Action

Despite the results above, when asked about the most **common barriers** (displayed in the word cloud in Figure 20) encountered by schools in implementing the climate action initiative they highlighted in their climate action story, participants most often mentioned **time and money**.

The evaluation also provides insight into factors that help create **successful climate action initiatives**. As shown in the word cloud in Figure 21, the schools in the evaluation reported **partnering with the broader community**; having the **support of students, teachers, staff, and administrators**; and the presence of **supportive sustainability values** within the school and surrounding community were most helpful for creating climate action initiatives.

Figure 21. Common Drivers of Climate Action

SUMMARY & RECOMMENDATIONS

OVERVIEW OF KEY FINDINGS

The initiatives highlighted in this report are examples of how schools in the UNESCO Associated Schools Network are working to become models of climate action. A total of 27 Canadian ASPnet schools provided data on a variety of exciting initiatives happening across Canada.

In general, the results suggest that participating in the pilot did have effects on school governance, as well as on facilities and operations in the participating schools; however, the evaluation highlighted several areas for improvement as well. It is worth noting here that participating in pilot projects such as the UNESCO climate change project can make participants more critical of climate action taking place in their contexts as a result of learning about the complex and systemic nature of climate change and responses to climate change. Thus, it is possible that differences between the pilot and non-pilot schools are larger than the findings in this report suggest.

For ease of comparison, our summary of results below includes percentages; however, it should be noted that the sample sizes are small and the ability to generalize and draw conclusions somewhat limited as a result.

Governance

- We saw evidence of promising governance-related initiatives in the schools that participated in the evaluation, including uptake of climate action in policies, procurement, and funding schemes. Several schools had implemented committees to raise awareness of climate action in their school
- Pilot schools were more likely than non-pilot schools (50% pilot vs. 29% non-pilot) to have conducted a self-assessment of current climate actions
- Regardless of whether they had participated in the pilot, most schools had not developed a definition of what climate action meant at their school; brainstormed a list of things that made their school unsustainable; nor developed a vision, mission, or values statement on climate action
- 60% of pilot and 50% of non-pilot schools had a climate action team
- Participating in the pilot project did not appear to impact whether a school had a climate action plan; 30% of pilot and 29% of non-pilot schools had climate action plans
- Amongst schools that did have a climate action plan, whole school domains were well-addressed, suggesting the climate action plans that had been developed were adopting whole-school approaches

Teaching & Learning

- Non-pilot schools were somewhat more likely to indicate greater integration of climate change in all subject areas relative to pilot schools; 43% of non-pilot schools said between 50-79% of subjects included climate change topics compared to 33% of pilot schools
- Regardless of whether a school participated in the pilot, science and technology; geography, language and literature; and civics and citizenship courses were most likely to include a climate focus
- Given that Canada has a federated education system, we asked the extent to which integration of climate change into course subjects was driven by the provincial government
  - The responses suggest that provincial governments were contributing to uptake of climate change topics in curriculum in meaningful ways, with most schools attributing integration was to a "moderate" or "large" extent due to provincial curriculum
- The results suggest that climate change education was being used to teach critical, creative, and future thinking skills; although, the results also suggested that schools could

be taking more advantage of the ability to teach students about, from, and through climate action
- When asked about uptake of socio-emotional elements into climate change education, the results suggest that schools are beginning to attend to socio-emotional factors, although there was room for improvement
    - In particular, students were being empowered to take action on climate change and being provided with opportunities to design and implement climate action projects
    - The survey respondents also indicated the information on climate change being presented in class was personally relevant and meaningful for students
    - The results also suggested room for improvement in engaging students in creative activities, connecting students to their local place, and considering the emotions students experience when learning about climate change

Facilities

- Schools were engaged in many projects to directly impact their carbon footprints, including composting, waste sorting, recycling, solar panels, using local products, and tree planting
- Other innovative facilities and operations-based initiatives included zero waste snacks, vegetarian lunches, Carbon Neutral Day, and Carbon Reduction Challenges to encourage eco-friendly transportation use

Community Partnerships

- The schools in the evaluation were involved in a variety of community partnerships to further climate action including around emissions reduction, recycling, and entrepreneurship
- The Simply Living Simply program at Bruce Peninsula District School emerged as a particularly promising whole school approach which includes school-level challenges that engage the entire community
- 30% of the pilot schools and 36% of the non-pilot schools had between 3 and 6 formal community partnerships at the time of the evaluation
- The most frequent collaborations were with families, other schools, as well as national and international networks

PROMISING PRACTICES

The evaluation found a wide variety of other initiatives occurring in Canadian ASPnet schools across all four whole school domains, with innovative practices occurring in each of the whole school domains.

1. The Canadian ASPnet Collaborative Network

Throughout the analysis, it was very apparent how much Canadian ASPnet schools learn from each other, especially during ASPnet conferences. This influence is illustrated in the ten stories presented. For example, two schools used climate change challenges, two schools had Carbon Neutral Days (Zero Emissions Days), and two schools were involved in the Carbon Scol'ÈRE program.

2. Diverse Climate Action Actors

Networked connections were further supported by collaborative school spirit and interpersonal relationships often spearheaded by sustainability champions. Within Canadian ASPnet schools, climate actions were led by diverse members of the school community, such as students of all ages, teachers, and management.

3. Making Climate Change Local and Relevant

Several schools connected to local climate issues through topics such as water quality and flooding. Climate change can seem like a far-away issue of little relevance within students' daily lives. Finding local meaning can make climate change a more engaging topic for students.

4. Creatively Using Technology

Multiple Canadian ASPnet schools utilized technology in new and exciting ways. Whether it was by communicating about whole-school climate action approaches through websites or using technology to remotely 'go to school,' many schools creatively engaged with technology to learn about climate action.
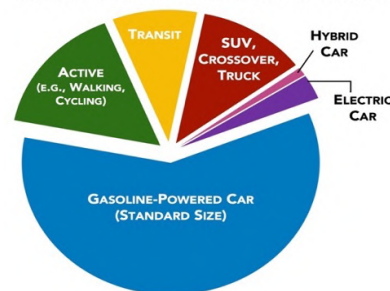
5. Provide Concrete, Feasible Climate Actions

The complex issues associated with climate change can be overwhelming for students. Many Canadian ASPnet schools tackled these challenges by actively engaging in climate action projects and supporting students to take concrete actions.

STUDENT TRANSPORTATION METHODS
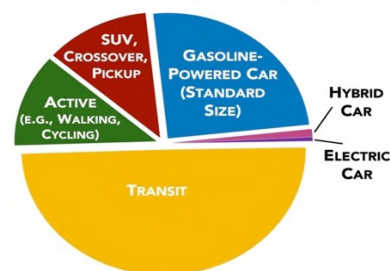
TEACHER TRANSPORTATION METHODS

Collège Regina Assumpta Transportation Survey Results

The Greenhouse at Collège Bourget

NEXT STEPS

While these promising practices represent positive first steps towards 'good' climate change education, future whole-school climate change education projects could:

1. Connect to Indigenous perspectives:

Canadian ASPnet schools sometimes incorporated Indigenous perspectives within their classes but rarely linked them to climate action. Future climate action projects could be strengthened by incorporating Indigenous perspectives, which are deeply embedded in caring for the land for future generations.

2. Expand Beyond Individual-Focused Solutions

Several climate action projects within Canadian ASPnet schools fall within the facilities and operations domain and encourage individual-based change. Similarly, several schools' climate action projects focused on encouraging entrepreneurism and market-based solutions to climate change, which also rely on changes individuals can make in their own behaviors. Instead students could be encouraged to utilize critical thinking skills to determine the source of problems. In the future, schools could be adopting climate action approaches that help address feelings of powerlessness associated with climate change and implementing initiatives aimed at broader systemic social structures supporting climate inaction. For example, schools could be engaging with the community to raise awareness about climate action. Students could also be

engaging with representatives in municipal, provincial, and federal government to advocate for broader governmental and policy change.

3. Create a Teacher's Guide for Incorporating Climate Change into All Subjects

Several schools expressed interest in incorporating climate change into all subjects but highlighted the difficulty in doing this due to a lack of ready-made resources for teachers to pick up and directly use within their classes. While the "Getting-Climate-ready" guide was helping in terms of conceptualizing how this might be done (e.g., suggesting math teachers use graphs related to climate change), the amount of work required by teachers to create these materials resulted in significant barriers to cross-subject integration. Programs such Carbon Scol'ÈRE saw a much higher uptake due to their provision of classroom-ready materials for teachers.

4. Develop an Easily Accessible Online Platform Where Schools Can Readily Share Ideas, Problems, and Resources

While it was obvious that Canadian ASPnet schools learn a lot from each other, it was also apparent that more on-going idea exchanges might also be helpful. For example, several schools lamented that their school's cafeteria food service company would not negotiate to stop selling water bottles. These schools, which are experiencing similar problems, could come together and put pressure on those companies to support those initiatives. A user-friendly online platform could support further networking amongst UNESCO ASPnet schools. It is the evaluators' understanding that the ASPnet Online Tool developed by UNESCO was designed to support collaboration in this manner and that the user-friendliness of the platform could be improved in order to encourage participation. Collaboration via social media platforms could also be explored.

The 10 Canadian ASPnet "Getting Climate-Ready" pilot schools have made significant steps to help mitigate climate change. The many exciting climate action initiatives taking place in the schools provide an inspiring reminder of the power and promise of collective action the fight against climate change.

REFERENCE LIST

Aikens, K., McKenzie, M., & Vaughter, P. (2016). Environmental and sustainability education policy research. A systematic review of methodological and thematic trends. *Environmental Education Research, 22*(3), 333-359.

Beveridge, D., McKenzie, M., Aikens, K., & Strobbe, K. M. (In press) Sustainability in Canadian K-12 Education: Reviewing Policy Initiatives Across School Divisions and Provincial Ministries of Education. *Canadian Journal of Educational Administration and Policy.*

Bieler, A., Haluza-DeLay, R., Dale, A., & McKenzie, M. (In press). A national overview of climate change education policy: Policy coherence between subnational climate and education policies in Canada (K-12). Journal of Education for Sustainable Development.

Brownlee, M.T.J., Powell, R.B., & Hallo, J.C. (2013). A review of the foundational processes that influence beliefs in climate change: opportunities for environmental education research. Environmental Education Research, 19(1), 1-20, DOI: 10.1080/13504622.2012.683389.

Gonzalez-Gaudiano, E., & Meira-Cartea, P. (2010). Climate change education and communication: A critical perspective on obstacles and resistances. In F. Kagawa & D. Selby (Eds). Education and climate change: Living and learning in interesting times (pp. 13-35). New York, NY: Routledge.

Henderson, K and Tilbury, D. (2004). Whole-School Approaches to Sustainability: An International Review of Sustainable School Programs. Report Prepared by the Australian Research Institute in Education for Sustainability (ARIES) for The Department of the Environment and Heritage, Australian Government. Downloaded from http://aries.mq.edu.au/projects/whole_school/files/international_review.pdf.

Hornsey, M. J., Harris, E. A., Bain, P. G., & Fielding, K. S. (2016). Meta-analyses of the determinants and outcomes of belief in climate change. Nature: Climate Change, 6, 622-626. doi: 10.1038/NCLIMATE2943

Kahan, D. M., Peters, E., Wittlin, M., Slovic, P., Ouellette, L. L., Braman, D., & Mandel, G. (2012). The polarizing impact of science literacy and numeracy on perceived climate change risks. Nature: Climate Change, 2, 732-735.

Kollmus, A. & Agyeman, J. (2010). Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? Environmental Education Research, 8(3), 239-260, DOI: 10.1080/13504620220145401.

McKenzie, M., & Reid, A. (2017). Course materials for EFDT 898: Climate Change Education. University of Saskatchewan.

Monroe, M. C., Plate, R. R., Oxarart, A., Bowers, A., & Chaves, W. A. (2017). Identifying effective climate change education strategies: A systematic review of the research. Environmental Education Research, 1-22. doi: 10.1080/13504622.2017.1360842.

Ojala, M. (2015). Hope in the face of climate change: Associations with environmental engagement and student perceptions of teachers' emotion communication style and future orientation. The Journal of Environmental Education, 46 (3), 133-148. doi: 10.1080/00958964.2015.1021662.

Reid, A., & McKenzie, M. (Eds.). (2017). Climate change and education [Virtual special issue]. Environmental Education Research.

Shome and Marx. (2009). The psychology of climate change communication: A guide for scientists, journalists, educators, political aides, and the interested public. Downloaded from http://guide.cred.columbia.edu/pdfs/CREDguide_full-res.pdf.

Tuck, E., McKenzie, M., & McCoy, K. (2014). Land education: Indigenous, post-colonial, and decolonizing perspectives on place and environmental education research. Environmental Education Research, 20(1), 1-23, DOI: 10.1080/13504622.2013.877708.

UN General Assembly. (1992). United Nations Framework Convention on Climate Change. Newyork: United Nations, General Assembly. Downloaded from https://unfccc.int/resource/docs/convkp/conveng.pdf.

UNESCO. (2016). Getting climate-ready: A guide for schools on climate action. Published by the United Nations Educational, Scientific and Cultural Organization. Paris, France. Downloaded from http://unesdoc.unesco.org/images/0024/002467/246740e.pdf.

Wibeck, V. (2013). Enhancing learning, communication and public engagement about climate change – some lessons from recent literature. Environmental Education Research, 20(3), 387-411, DOI: 10.1080/13504622.2013.812720.

APPENDIX A: DETAILED DESCRIPTIONS OF CLIMATE ACTION INITIATIVES

	School	Domain(s)		Initiative
GOVERNANCE	Collège Durocher Saint-Lambert	🟩	🟧	**Environmental Committees:** Two environmental committees raise awareness about many environmental issues, including waste management. Other student committees also raise awareness on other environmental topics. Students participating in these committees research different environmental topics with teacher support, then visit classes to educate students and teachers.
	Collège Sainte-Anne	🟩	🟦	**Sustainable Development Policy:** For the past three years, Collège Sainte-Anne has held two Carbon Neutral Days a year as part of their Sustainable Development Policy. On this day, about 2,000 students and 200 employees work from home. Everyone also answers an ecological footprint survey to measure emissions reduction on that day.
	École Secondaire La Poudrière	🟩	🟦	**Reusable Water Bottle Procurement:** Many people in their school were using bottled water, which was often getting thrown away. The school knew their cafeteria company would not stop selling water bottles so they began offering reusable water bottles to new students and conducted an awareness campaign for existing students and staff.
	Bairdmore School	🟩 🟪	🟦	**Funding Partnerships:** An outdoor classroom initiative encourages outdoor play and sustainable actions, such as growing vegetables and plants in their outdoor planters. They have also formed a partnership with their school advisory council to apply for grants for this project.
	École Francophone d'Airdrie	🟩 🟪		**Three-Year School Plan:** For the past three years, as part of their three-year plan to meet UNESCO associated schools' goals, they have held a mini-UNESCO conference where students learn from each other and community about an annual theme. This year the students learned about topics related to climate change.
	Pickering College	🟩	🟧 🟦	**Funding Student-Led Climate Action in Schools:** Grade 1 students participate in a Clean Bin Challenge where each student is given a bin in which they have to put all their garbage for a month with the goal of living waste-free. Another, interdisciplinary research project, is done with Grade 9 students have to develop an innovative idea to make their school or community more sustainable. The student that wins gets a grant from the school to implement their idea.

	School	Domain(s)		Initiative Description
TEACHING & LEARNING	Académie des Sacrés-Coeurs	🟪	🟧	**Student Challenges & Carbon Exchange Programs:** The school offered ten challenges related to sustainable development and climate change to all students. Each teacher was able to create their own projects to address the challenges. This initiative was strengthened by pairing it with already existing biodiversity workshops and participation in Scol'ère Carbon Exchange Program.
	Collège Beaubois		🟧	**Climate Action in the Classroom:** Several teachers include climate action in their classes through a variety of activities including debates. Students at all levels learn about Indigenous cultures, the environment, and climate change.
	École Beausejour Early Years		🟧 🟦	**Climate Action Programs in All Grades:** École Beausejour Early Years School has programs related to climate action for all grades. They also have battery recycling, compost, and recycling programs, all of which are led by students.
	Queen Elizabeth High School	🟪	🟧	**Integration of ESD Across the Entire Curriculum:** Across the school, Queen Elizabeth High School has made education for sustainable development (ESD) a key theme of study. All classes must include ESD at some point. This initiative is further supported by many community partnerships which extend learning outside the classroom.
	Trafalgar Elementary School		🟧 🟦	**Classroom and School Level Projects:** The school has several projects related to the ASPnet theme on climate change, including individual class and whole school projects. For example, in French immersion classes, students have built habitats for bees and birds in their garden. The whole school has also been helping to make an Earth collage out of recycled materials to celebrate Earth day.
	Stephen Lewis Secondary School		🟧	**Research-Informed Action Projects:** Students conduct research projects to learn about local actions they can take to reduce their community's impact in relation to climate change. The project allows students to invest their time and effort towards real world problems and solutions to impact their local environment and community.

BUILDING CLIMATE-READY SCHOOLS: EVALUATION REPORT

School	Domain(s)	Initiative Description
Cavelier-de LaSalle	(teal)	**Industrial Composter:** Cavelier-de LaSalle had an industrial composter installed at the school to reduce their waste. They were able to give away 170 kg of compost to other elementary schools and teachers for their gardens.
Collège Regina Assumpta	(orange)	**Carbon Neutral Day:** Inspired by Collège Sainte-Anne, Collège Regina Assumpta held a Carbon Neutral Day in February 2018. Students, teachers, board members, staff and their spouses all worked from home. The school also collected data on school members' transportation use, which they will use to reduce their footprint.
Hafford Central School	(purple) (teal)	**Waste Management & Tree Planting:** Students are taught proper waste sorting and the recycling program is run by students. Some students took a field trip to a local waste management site to see how waste is managed and sorted. The school is partnering with the waste management site in spring 2018 to plant trees at the site.
Bethlehem Catholic High School	(orange) (teal)	**Solar Panels:** The school plans on installing solar panels, which have been approved by the school board. They are currently seeking funding for implementation. Students did most of the research with the support of several teachers interested in reducing the school's energy consumption and switching to green energy.
École Blanche-Bourgeois	(orange) (teal)	**Cafeteria Local Food Project:** Students are taught how to cook with local products and eat healthy lunches in the cafeteria. They are also taught the benefits of using products from their regions. The school has a composting system and they use the compost to enrich the soil of their school garden.
Niton Central School	(orange) (teal)	**Student-Run Recycling:** Each week, students go around to each classroom and collect recyclable materials to take them to the recycling station. The students also learn about what it means to recycle and how to protect the environment.
Sa-Hali Secondary	(teal)	**Carbon Reduction Challenge:** Many of their students are driven to school by their parents and the students noticed this creates a lot of greenhouse gas emissions. Now the school has the Carbon Reduction Challenge where, for two days a month, students are challenged to find an alternate method of getting to school. Students who participate get a stamp on a card. Students with the highest number of points are entered into a draw for a movie gift certificate.

School	Domain(s)	Initiative Description
Bruce Peninsula District School	(orange) (purple)	**Simply Living Simply:** Bruce Peninsula developed two different websites. One describes their whole school approach to climate action and the other is built around monthly climate change themes. Students learn about a theme for a month then share their knowledge with the school and local communities in multiple ways.
Collège Bourget	(orange) (purple) (teal)	**Student Social Economy Enterprises:** Students learn entrepreneurship and marketing skills through a sustainable development lens. Students learn how to operate a greenhouse, which produces vegetables and herbs. Students are involved at all stages of production from designing the seedbeds to designing marketing to sell the plants.
École des Amis-du-Monde	(orange) (purple)	**Carbon Exchange Programs:** Students learn how to reduce emissions through school workshops. They then teach other students and their families about eco-friendly lifestyles to reduce their emissions. Through participation in the Scol'ère Carbon Exchange Program, students can earn "educational carbon credits," which organizations can buy to offset their emissions.
École Émile-Nelligan	(purple) (teal)	**Partnering to Reuse & Recycle:** In collaboration with their partner, Super Recyclers, they collect used or damaged items to resell or recycle. They donate the money received to organizations, such as Oxfam QC for classroom workshops on similar topics.
École La Source	(purple) (teal)	**Community Gardening:** This year the school a garden in collaboration with a community partner. Many teachers and students are involved in this project. Eventually, garden boxes will be added to the neighborhood community garden, and they will transfer shoots from the school garden to the community garden.
École Tuxedo Park	(purple) (teal)	**Partnering to Recycle & Refill:** The school works collaboratively with Recycle Everywhere to recycle everything they can; this initiative is supported across their school division. The school also has a water bottle refill station which shows the number of bottles prevented from being dumped by using the station.