Generation Green

PROJECT TOOLKIT

2025/26

Prepared by

HALTON ENVIRONMENTAL NETWORK

"Investing in the Next Generation of Climate Leaders for a Sustainable Future"

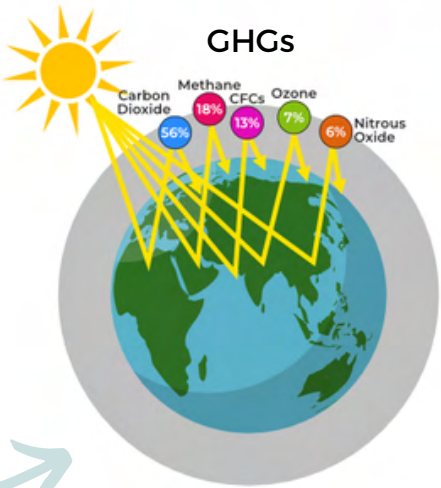
GENERATION GREEN MISSION

Halton Youth - Taking Climate Action Now!

Halton Region and all of its municipalities (the City of Burlington, Town of Halton Hills, Town of Milton, and the Town of Oakville) have declared a Climate Emergency. We must take action now and work towards a healthier, more sustainable future.[1]

Concentrations of carbon dioxide and other greenhouse gases (GHGs) in the Earth's atmosphere have drastically increased due to emissions from human activity.[2]

As GHGs trap heat in the atmosphere, this has posed a large problem for the integrity of our climate and the health of our planet.[2]



Generation Green:

Empowering students to drive climate action, Generation Green is a youth-driven initiative which provides resources for students to design and implement innovative climate solutions by addressing the UN Sustainability Goals; ultimately reducing greenhouse gas emissions in the Halton community.

GENERATION GREEN COMPONENTS

Generation Green is delivered over the following 3 phases:

More than 150 Halton students attend an inspiring Youth Conference. The conference includes esteemed keynote speakers and engaging interactive workshops.

Participating students sign up to complete their own project. With the help of detailed project guidelines, interactive webinars, and mentorship from HEN staff.

Project participants and attendees come together in a ceremony. Awards are presented to winning projects and students have a chance to share their work with their peers.

PROJECT GOAL

SUSTAINABLE DEVELOPMENT GOALS

2025/2026

The Sustainable Development Goals (SDGs) were adopted by the UN General Assembly in 2015 with the aim of achieving a more sustainable future by 2030.[3]

Over the past two decades, the Halton Environmental Network (HEN) has been empowering our communities to drive meaningful climate action, making significant strides in advancing **SDG 13**, commonly known as "**climate action.**" Recognizing its pivotal role in supporting numerous other goals, HEN is dedicated to addressing **SDG 13** throughout its various initiatives, including Generation Green.

In addition to our commitment to climate action, each year Generation Green dedicates itself to a central theme aligned with another SDG.

This year, our focus is on **SDG 11: Sustainable Cities and Communities** and **SDG 13: Climate Action**. Achieving this goal taking actions individually and as a community to achieve a more sustainable future!

Our youth conference workshops for the 2025/2026 program will center around strategies to intergate sustainability into your everyday lives. Projects undertaken during this period must address this theme as a minimum requirement, with the opportunity to also contribute to any other SDGs of the participant's choice.

TIMELINE

1 Project Proposal Due:

JANUARY 12 is the last day to submit your project proposal form. The form can be edited up until this date.

2 Webinars

Beginning in January, webinars are offered to help you in your journey. **You must attend at least 1 webinar**.

3 Final Project Due:

12th April is the last day to submit your project. After submission, a panel of judges will be review your projects, and you could be eligible to win some amazing prizes!

4 Project Showcase Event:

Spring 2026, we will host a wrap-up event in celebration of all of your completed projects!

Grade 9-12 Halton Students earn 20 Community Involvement Hours upon submitting their project!

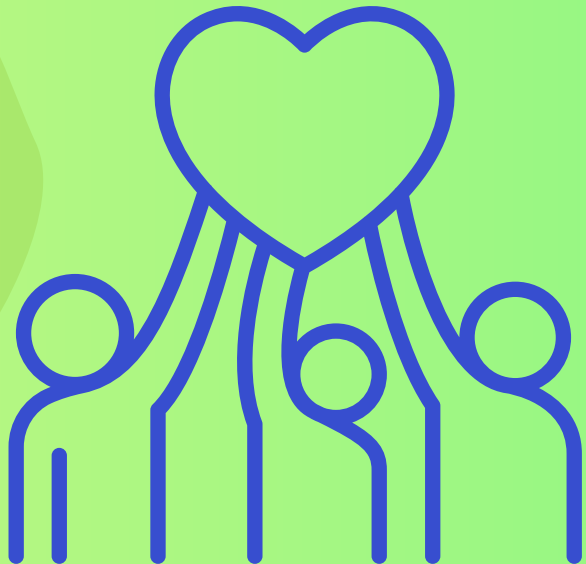
GENERATION GREEN

LIVING SUSTAINABLY THROUGH CLIMATE ACTION

THE JOURNEY CONTINUES

EARNING COMMUNITY INVOLVEMENT HOURS

- Submit the project proposal ✓
- Complete the project ✓
- Submit your final report ✓



PROJECT PLANNING:
PAST PROJECT EXAMPLES

1

Turn off the Lights!

Sarim, Yusuf and Abd Allah

2022 - 2023

Activity: shutting down the school's electrical systems on weekends and holidays, resulting in a significant reduction in the school's energy consumption.

2

Ugly Foods Initiative

Gabriela Jaramillo Pulido, Harshini Hariganesh, Sofia Rocha and Francesca Rocha

2023 - 2024

Activity: created a seminar for school peers to encourage them to buy from the discounted food shelf in grocery stores to reduce food waste. These shelves contain produce that is unfit for regular sale due to appearance-related factors, but is still edible and delicious.

3

EcoBites

Ella Chen, Sarah Chen, Elizabeth Kostelnik and Sophia Kostelnik

2024 - 2025

Activity: created a website to help the users to use their excess ingredients and introduce new healthy and delicious recipes, with the aim of reducing food waste, which in turn would reduce energy and GHGe wasted on producing, transporting, processing, and storing food

PROJECT PLANNING:
BRAINSTORMING

Brainstorm 2-4 potential actions you can pursue to help improve energy efficiency and decrease energy-related GHG emissions in your community.

Feel free to use the space provided to record your thoughts!

List of Potential Actions:

Additional Notes/Comments:

Tip: *think outside the box! Almost all of our actions consume energy one way or another!*

Actions can take a direct approach (i.e. using more natural light versus artificial lighting in your home), or may address this theme from a broader perspective (i.e. limiting your consumption of goods that are not manufactured using sustainable energy practices).

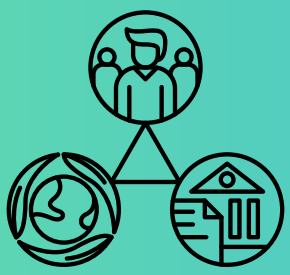
PROJECT PLANNING:
SELECT AN IMPACTFUL ACTION

Select the activity that you would like base your project on. Ensure that the action selected is measurable, as you must be able to quantify your impact (you need to calculate the amount of GHG emissions produced before and after implementing your project)!

Feel free to use the space provided to record your thoughts!

Chosen action:

What will success look like for your project?



How will you measure your impact?

What SDGs will your project's outcome address?

Check-off any additional SDGs:

[1] No Poverty
[2] No Hunger
[3] Good Health
[4] Education
[5] Gender Equality
[6] Water
[7] Energy
[8] Economy
[9] Industry Innovation
[10] Reduced Inequalities
[11] Sustainable Communities
[12] Responsible Consumption
[13] Climate Action
[14] Aquatic Life
[15] Terrestrial Life
[16] Peace, Justice, Strength
[17] Collaboration

PROJECT PLANNING:
RECORDING AND DOCUMENTING

Brainstorm ways to capture your journey. Consider forms of media such as: video, photo journaling, and/or by launching a social media campaign.

Feel free to use the space provided to record your thoughts!

How can you tell the story about what you are accomplishing?

***Tip:** you should also consider any content you might need in order to carry out your initiative, such as: presentations, fliers, or websites.*

PROJECT PLANNING:
CONSIDERATIONS AND IMPLEMENTATION

Drawing upon the progress made by you/your team thus far, focus on refining the details of your climate project in the sections below.

Feel free to use the space provided to record your thoughts!

Determine a time-frame for your initiative:
(eg. 3 days, 1 week, or every Tuesday for 3 weeks)

Who needs to be involved?
Depending on your chosen action, others might need to participate.

- ☐ Students
- ☐ Parents
- ☐ Community members
- ☐ Other

Know your audience!
What are 2-4 things you need to consider when working with this audience specifically?

Remember: *you will need to accurately measure the GHG emissions throughout the duration of your Project!*

PROJECT PLANNING:
PROPOSAL

The template below outlines all of the **elements required for the project proposal submission**. For your submission, you may **keep your responses brief** (1-3 sentences).

Proposal Submission Due Date: JANUARY 12

Use the space provided to record your thoughts!

Please describe your project idea:

Please describe how your project will reduce GHG emissions:

Please state what resources you will need to complete your project:

Please describe how you will measure your impact:

READY TO BEGIN!

What to remember while undergoing your project:

Measure, track, and record your impact!

- You need to measure GHG emissions BEFORE and AFTER the implementation of your project in order to track the difference. Record the reduction to measure your impact.
- There will be scheduled workshops and webinars to help you with this. Make note of these dates! They are all outlined within this Toolkit.
- Remember that you can always consult HEN staff at any point along your journey for help or advice.

Document your journey along the way!

Generation Green

HALTON ENVIRONMENTAL NETWORK

FINAL REPORT ROUGH DRAFT

The template below outlines all of the elements required for the final report submission. Jot down some key points you plan to elaborate on in your final report to address each element.

Final Report Due Date: APRIL 12

Feel free to use the space provided to record your thoughts!

Tip: you may find it easiest to integrate "Emissions" into the results section of your reflection!

Reflection:

1. Who, What, Where, When, & Why:

2. Methodology (How):

3. Results of your project:

4. Discussion/next steps:

5. How the project is creative, innovative, and impactful:

6. Integrated elements of collective climate action impact:

Don't forget to note any assumptions/ estimates: why you made them and how you came up with them!

Emissions:

The final impact of GHG emissions reduced from your project

You will also attach your calculations (spreadsheet file, picture of your work, etc.)

List of any supplementary material you created to document your initiative:

You will attach this material to your submission.

Visual component:

(summarizing your project)

- ☐ Slideshow Presentation
- ☐ Poster

EMISSION CALCULATIONS

Keep track of the variables required for your calculations here.

Feel free to use the space provided to record your thoughts!

Baseline GHG emissions (before project):

Activity value:

Energy Intensity value:

Emission factor value:

GHG emissions after implementing your project:

Activity value:

Energy Intensity value:

Emission factor value:

Tip: the activity value will likely be the only one changing before versus after your project!

CALCULATE YOUR IMPACT (PART 1)

GHG Emissions = Activity × Energy Intensity × Emission Factor

Activity = quantity of the chosen activity before and during your project, respectively. This is what you will need to measure (e.g. distance driven, length of time using a lightbulb, or quantity of food consumed).

Energy intensity = amount of energy consumed during that activity.

This value is provided to you in the tables below (Table 1.0, 2.0, and 3.0)

Emission factor = amount of GHG produced by one unit of fuel or energy.

This value is provided to you in the tables below (Tables 4.0 and 5.0)

***Tip:** For consumption based activities, you will use the following equation:*
GHG emissions = quantity × carbon intensity. The quantity consumed will be what you measure, and the carbon intensity (for food) is outlined in Table 6.0

Energy Intensity Values

1. Common Energy Conversions Appliances

Energy Source	GJ	ekWh
1 cubic meter (m^3) Natural Gas	0.0373	10.36
1 kilowatt hour (kWh)	0.0036	1
1 Liter (L) Propane	0.0255	7.09
1 Liter (L) Gasoline	0.0346	9.61
1 Liter (L) Diesel	0.0387	10.75

2. Common Vehicle Fuel Efficiencies

Type of Vehicle	Fuel Consumption (L/100Km)
Sedan	9.6
Luxury Sedan	12.2
Sports Car	14.3
Van	10.7
Pickup Truck	14
SUV	12.3
Diesel Bus	78.4

Emission Factor Values

3. Vehicle Fuel Emissions Coefficients

Mobile Combustion	GHG Coefficient	unit
Gasoline Vehicles	2317	g CO2e/L
Light Duty Diesel Vehicles	2728	g CO2e/L
Heavy Duty Diesel Vehicles	2748	g CO2e/L

4. Ontario Average GHG Intensity for Electricity

	GHG Coefficient	unit
Electricity	20	gCO2e/kWh

5. Common Power Use for Household

Appliance	Watts (J/s)
Air conditioner	1,400
Dehumidifier	257
Ceiling fan	125
Heater	1,500
Humidifier	177
Hair Dryer	1,000
Blender	400
Coffee Maker	894
Dishwasher	1,200
Microwave Oven	1,450
Freezer	341
Refrigerator	440
Clothes Dryer	4,900
Washer	512
42" Plasma TV	320
Computer	500
Hot Tub	5,000
Lightbulb	Look on bulb

Consumption-based activity values

6. GHG Emissions for Common Foods

Food	kg of CO2e emissions per Kg of Food
Lamb	39.2
Beef	27.0
Cheese	13.5
Pork	12.1
Farmed Salmon	11.9
Turkey	10.9
Chicken	6.9
Canned Tuna	6.1
Eggs	4.8
Potatoes	2.9
Rice	2.7
Peanut Butter	2.5
Nuts	2.3
Yogurt	2.2
Broccoli	2.0
Tofu	2.0
Dry Beans	2.0
Milk	1.9
Tomatoes	1.1
Lentils	0.9

CALCULATE YOUR IMPACT (PART 2)

GHG Emissions = Activity × Energy Intensity × Emission Factor

You will use the the **"GHG Emissions"** formula twice - first: to calculate the Baseline GHG emissions (before implementing your climate project), and second: to calculate the GHG emissions after implementing your climate project.

<u>This means you will end up with two emission values:</u>

[1] Baseline GHG Emissions

[2] Project GHG Emissions!

Impact = Baseline GHG Emissions - Project GHG Emissions

Next, you will use the **"Impact"** formula to calculate how much your climate project reduced GHG emissions.

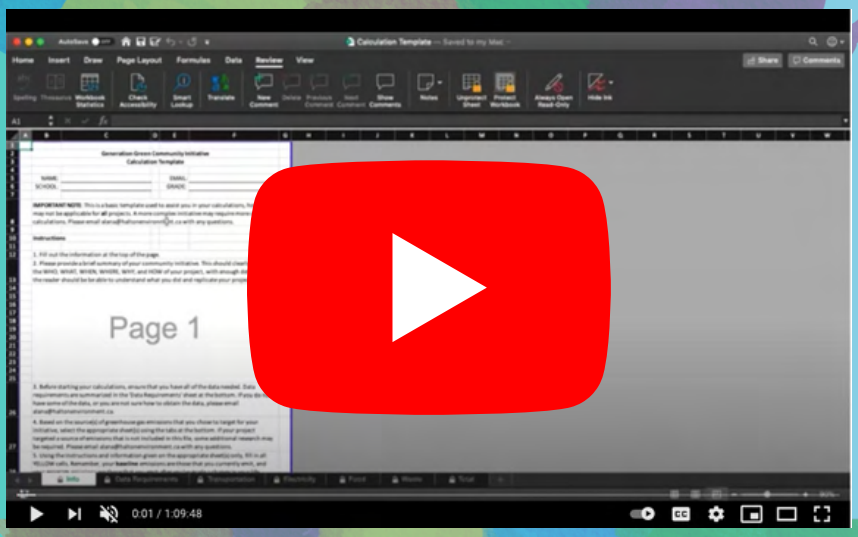
This formula computes the **change in emissions** before versus after implementing your climate project by using the values obtained from the "GHG Emissions" formula!

CALCULATION TIPS

Use the provided spreadsheet to help guide and tabulate your calculations.

Attend the Measure, Track, Record Webinar

Email the HEN Team volunteer@haltonenvironment.ca, for any clarifications



Watch our recording on how to use the 'How to Track, Measure and Record' spreadsheet to input your calculations!

WORKSHOP SUMMARY:
MEASURE, TRACK, RECORD

An important part of your Project is to track your impact! Follow our speakers' helpful guide to determine how much GHG emissions you have reduced. If you are having trouble calculating after watching the recording and following the steps below, contact us at HEN.

How do you calculate GHG emissions?

This is the equation you will use! →

GHG Emissions = Activity × Energy Intensity × Emission Factor

What is an Activity?

An activity is a quantity of GHG producing behaviour, such as:

- *Driving x distance*
- *Using a lightbulb for y amount of time*
- *Eating z quantity of food*

Reminder:

Some activities are easier to quantify than others. Think about how you will quantify your activity before you decide what to do. The above examples are relatively simple activities to quantify. While others are certainly possible and accepted, they may require some additional research.

What is Energy Intensity?

Energy intensity is the amount of energy or fuel used per duration/ distance/ size for a particular activity, such as:

- *Liters per km (L/km)*
- *Kilowatt per hour (kWh)*
- *Cubic meter per hour (m3/h)*
- *Gigajoule per square meter (GJ/m2)*
- *British thermal unit per square meter (BTU/m2)*

Recall: Tables 1.0, 2.0, and 3.0 (page 23) for common energy conversions and intensities.

What is an Emission Factor?

An emission factor is the amount of GHG produced by one unit of fuel or energy, such as:

- *Electricity – 20 gCO2e/kWh*
- *Natural Gas – 1899 gCO2e/m3*
- *Gasoline Vehicle – 2317 gCO2e/L*
- *Diesel Vehicle – 2748 gCO2e/L*

Recall: Tables 4.0 and 5.0 (page 23) for common emission factors related to electricity and transportation.

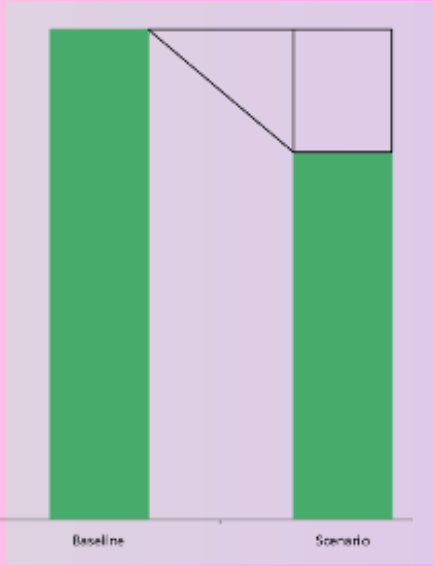
WORKSHOP SUMMARY:
MEASURE, TRACK, RECORD

For consumption-based activities:

Consumption-based activities, such as food and waste consumption, present some unique challenges.

Recall: Table 6.0 (page 23) for the carbon intensities of various types of foods.

So...how do you calculate the impact of your program?



1. Choose a program
Typically, a GHG reduction program will change one or more of these three things:

- Amount of activity
- Energy intensity
- Carbon intensity

2. Calculate Baseline GHG
If you made no change to your behaviour, how much GHG would you produce?

3. Calculate Program GHG
When you implement your initiative, how much GHG will you produce?

4. Impact = Baseline GHG – Project GHG
What is the difference between the baseline and the program GHG totals?

Reporting your impact:

The way in which you report your impact is crucial to communicating your results with the community. It is important that you report your results clearly and with sufficient details so that the community knows exactly what your impact was and how you achieved these results.

Some tips for reporting your impact:

Of the seven different GHGs, each one has a different global warming potential (GWP). This means that the same amount of each gas will contribute a different amount to global warming. As a result, GHGs are most often reported in CO2 equivalents (CO2e).

WORKSHOP SUMMARY:
MEASURE, TRACK, RECORD

Important Notes:

The magnitude of your impact will depend on how long you continue your initiative. However, in order to compare results, it is important that results are all reported in a standard unit (e.g. annually / per-year basis).

Please report your impact on an annual basis:

- Eg. if you continue your initiative for 1 month, you will multiply your impact by 12 in order to report how much impact you would have in 1 year (since there are 12 months in one year).

Keep a detailed record of all of your data and calculations! In the case of an error, this will ensure that you can go back and find where you went wrong. Your calculations should be written or typed out with enough detail and clarity that someone else would be able to look at them and follow along, step by step.

Use some of the data to help you with estimating the emissions impacts for your actions.

WORKSHOP SUMMARY:
MEASURE, TRACK, RECORD

If you cannot find the appropriate values for your initiative, additional data and guidance on estimating emissions can be found at the sources below:

IPCC Emission Factor Database

UNFCCC National GHG Inventory Reports

2021 NRCan Fuel Consumption Guide

NRCan Survey of Household Energy Use

Statistics Canada Energy Information Portal

Examples of Baselines vs Program GHG

	Baseline	Program GHG
Transportation	- Mode of transportation (ex. Driving, busing, biking, walking, etc.) - Distance travelled by each mode of transportation - If travelling by car: type of vehicle - If travelling by bus: average number of passengers on the bus at a time	- Mode of transportation (ex. Driving, busing, biking, walking, etc.) - Distance travelled by each mode of transportation - If travelling by car: type of vehicle - If travelling by bus: average number of passengers o the bus at a time
Electricity	- Length of time that each appliance is used - Wattage of each appliance - For lightbulbs, check the wattage on each bulb	- Reduced length of time that each appliance is used - Wattage of each appliance - For lightbulbs, check the wattage on each bulb
Food	- Mass of animal-based food product(s) that you will be reducing/eliminating	- Reduced mass of animal-based food product(s) - Mass of plant-based substitutes that are replacing th meat previously consumed (ex tofu, beans, soy milk, etc.)
Waste	- Mass of garbage, recycling, and compost (separated) produced - For community waste collection activities (ex community clean-ups, clothes drive, etc.): do not need any baseline data	- Reduced mass of garbage, recycling, and compost (separated) produced/ collected

JUDGING AWARD CATEGORIES

First Place Project

Note: there are multiple first place awards, as first place projects are evaluated within grade categories.

Most Creative Project

Most Impactful Project

Most Innovative Project

JUDGING RUBRIC (PART 1)

A project can earn a **maximum score of 110 points**. Each project is judged using **six different criteria.** Judges assign a score of 1 to 5 (1 being the lowest) to each category. This score is then multiplied by the weight factor assigned to that category. The scores for all six categories are then tallied to produce the total score.

Criteria	Description	Weight factor

Impact **(Biggest Impact Special Award Mark)**	• How much has your project reduced **OR** by how much does it have the potential to reduce GHGe ?
	• What is the scope (demographic, geographic, temporal) of the project?
	  ◦ How many participants were engaged in this project? What is the potential of engaging more participants?
	  ◦ What was the geographic radius of influence? What is the potential to expand the project over a larger geographical area?
	  ◦ How long did this project last/is it ongoing? What is the potential to continue over a long period of time?
		x5

Creativity **(Most Creative Special Award Mark)**	• Does the project demonstrate the use of imagination to brainstorm, plan, and execute an original idea to reduce GHGe? • Does the project demonstrate originality? How much does it differ from other projects? • Does the project effectively educate the community about their impact on the environment, inspire them to take climate action, engage participants, and/or make climate action fun?	**x4**
Innovation **(Most Innovative Special Award Mark)**	• Does the project demonstrate the use or development of new, advanced and/or original methods to reduce the GHGe? • Does the project demonstrate the use or development of novel technologies to reduce GHGe?	**x3**

JUDGING RUBRIC (PART 2)

Criteria	Description	Weight factor
Methodology	• Is the problem well-defined? • Is there a clearly defined idea on which a result can be achieved? • Are all assumptions/ estimates clearly explained? Are they reasonable/correct? Have they limited the margin of error as much as possible? • How easy is it to implement/execute this project? • Did the student(s) carry out the measurements/calculations, etc. correctly? • Did the student take advantage of the resources made available to them (ex. HEN resources, materials available in school, etc.)? • Is there adequate information provided by the data collected upon which to draw conclusions? • Are there any new questions or suggestions for continued work?	x3
Subject Knowledge	• What sources of information has the work been based on? • Is it clear that the project was well thought out? Is there a reason behind each decision made? Does the student's reasoning demonstrate a good knowledge of the topic? • Is the author familiar with the topic dealt with in his/her work? • Is the author familiar with alternative solutions? • Bonus: Is the student familiar with literature, ongoing research, and terminology in the field? To what extent have sources of popular science/references been consulted?	x4
Report and Visual Element	• Does the report provide sufficient information and are the level of text, illustrations, diagrams, and language sufficient so that the reader is able to understand exactly what the student did and would be able to replicate the project in their own community? • Are the writing and the content of the report well structured? Is the report free of spelling and grammatical errors? • If any images, diagrams, graphs, or other visuals are included, are they presented in an informative way? Do they support the information provided in the text? Are they visually appealing?	x3

LETS CELEBRATE
AT THE PROJECT SHOWCASE EVENT!

Congratulations! By completing your climate project, you have reduced your GHG emissions and made a positive impact on our planet! No matter the size of the action, every action counts in climate action. We will be holding a wrap-up event for all students to join us for breakfast, awards and prizes.

Photos from the 2024 Showcase Event

RESOURCES

MEASURING, TRACKING, AND RECORDING YOUR IMPACT

FAQS

Q: How do I measure my GHG Emissions?

A: To accurately calculate your GHG reduction, please consult the Table of Contents of this Toolkit and view the relevant pages!

Q: Where can I find the information I need to complete the project?

A: This Toolkit has amazing resources and tools to help you complete your climate project. HEN will also host workshops, webinars, and be available t contact for additional help!

Q: How can I engage the community in my project?

"Community" can be defined as any group that you are part of.

Some examples: family, friends, neighbourhood, extracurricular club, sports team, student associations, school classroom, school as a whole, social media followers, etc.!

A: ENGAGEMENT begins with promotion! How will you spread the word about your project?

Some examples: social media, informative posters (remember to seek permission before putting these up), asking others to share within their own networks, organizing a workshop or event, etc.!

Q: How do I submit my project?

A: Submit your project through Google Forms (form to be shared closer to due date), including a written report and a visual element to display how you tracked and measured your GHG reduction.

CONTACT US

We are here to help!

For any questions, comments, or concerns, students are encouraged to contact us at volunteer@haltonenvironment.ca. We will be the primary points of contact for students and will be available for support you throughout the implementation of student initiatives.

Submit Proposal >

Keep in touch on social media:

HALTON ENVIRONMENTAL NETWORK

Generation Green

SOURCES

[1] Halton Region. (2019). *Declaration of Climate Emergency.* Retrieved from the Halton Region Website at: https://edmweb.halton.ca/OnBaseAgendaOnline/Documents/ViewDocument/Notice_or_Motion_re_Climate_Change_Emergency.docx?meetingId=4054&documentType=Agenda&itemId=114852&publishId=61390&isSection=false

[2] Mitchell, J. F. (1989). The "greenhouse" effect and climate change. *Reviews of Geophysics*, 27(1), 115-139.

[3] United Nations. *The 17 Goals*. Retrieved from the United Nations Website at: https://sdgs.un.org/goals

[4] United Nations. *Ensure access to affordable, reliable, sustainable and modern energy*. Retrieved from the United Nations website at: https://www.un.org/sustainabledevelopment/energy/

"Investing in the Next Generation of Climate Leaders for a Sustainable Future"