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Achieving GHG net-zero emissions

(based on the 2021-22 – GHG emissions inventory)

April 20, 2023

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Achieving GHG net-zero emissions for 2021-22

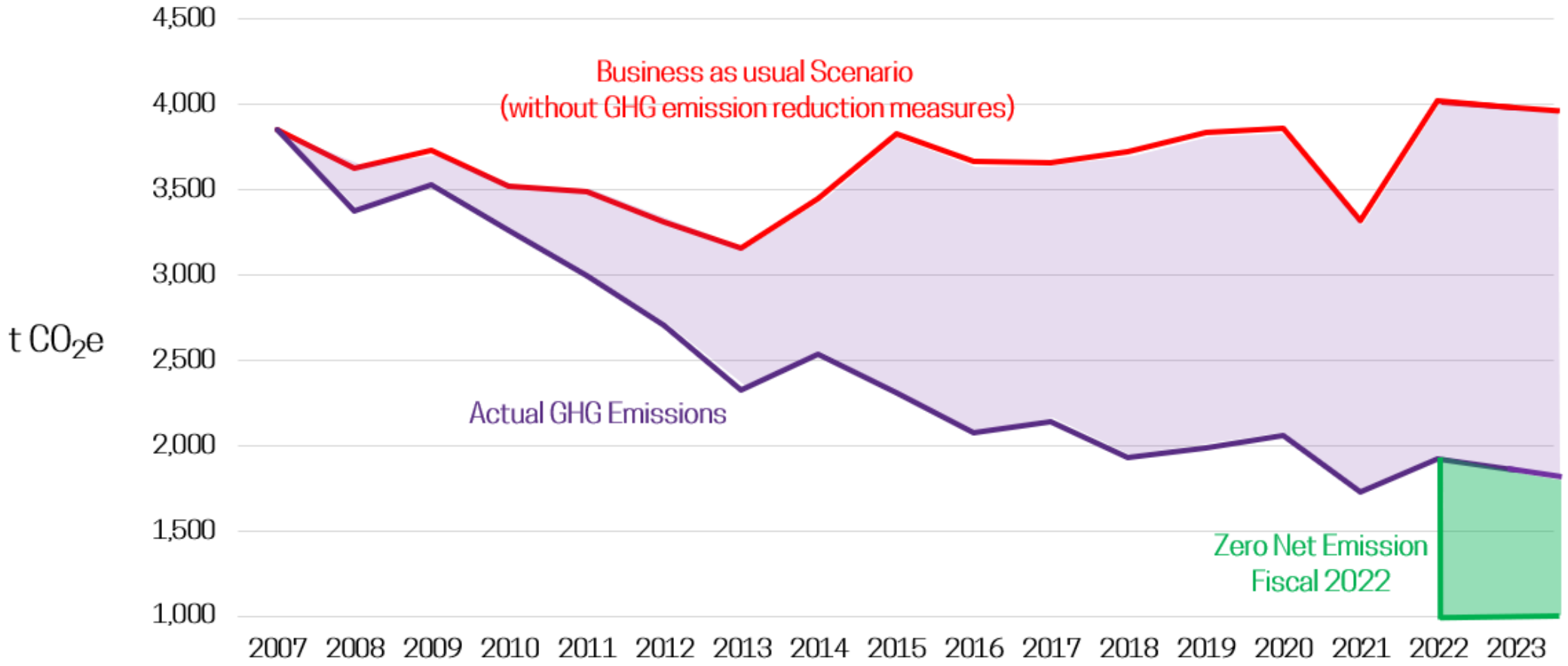
- Bishop's has reduced its GHG emissions from owned and controlled sources as well as from purchased energy (scope 1 and 2) by more than 50% (from 3,853 to 1,918 tons of CO_2e) since 2007

- This significant milestone allows us today to achieve net-zero emissions seven years before our goal mainly as a result of three key initiatives:
  - Installation of a centralized energy loop including a geothermal heating system
  - Replacement of heating system in buildings recently renovated: Library Learning Commons, Student Centre, student residences, etc.
  - Offsetting the remaining GHG emissions through buying carbon credits

Achieving GHG net-zero emissions for 2021-22

- The University intends to achieve additional GHG emission reductions through renewable natural gas purchases and investment in energy saving initiatives when renovating our buildings, etc.
- Reducing the remaining GHG emissions (1,918 tons of CO_2e) will diminish the need to buy carbon credits over time to offset the impact of our scope 1 and 2 emissions
- While carbon sinks cannot be used to offset GHG emissions they are important contributors to capture carbon, especially at Bishop's
- Bishop's carbon sinks (forests on campus and the Johnville Bog and Forest Park) sequester 1,197 tons of CO_2 (equivalent to 62% of our scope 1 and 2 GHG emissions)

GHG Emissions Trend
Scope 1 & 2



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GHG emission (scope 1 and 2) reductions

GHG emissions (Tons of CO_2e)	2006-07	2021-22
Oil	445	33
Natural gas	3,224	1,576
Electricity	33	24
Vehicle fleet	46	74
Refrigerant leaks	106	211
Total	**3,853**	**1,918**

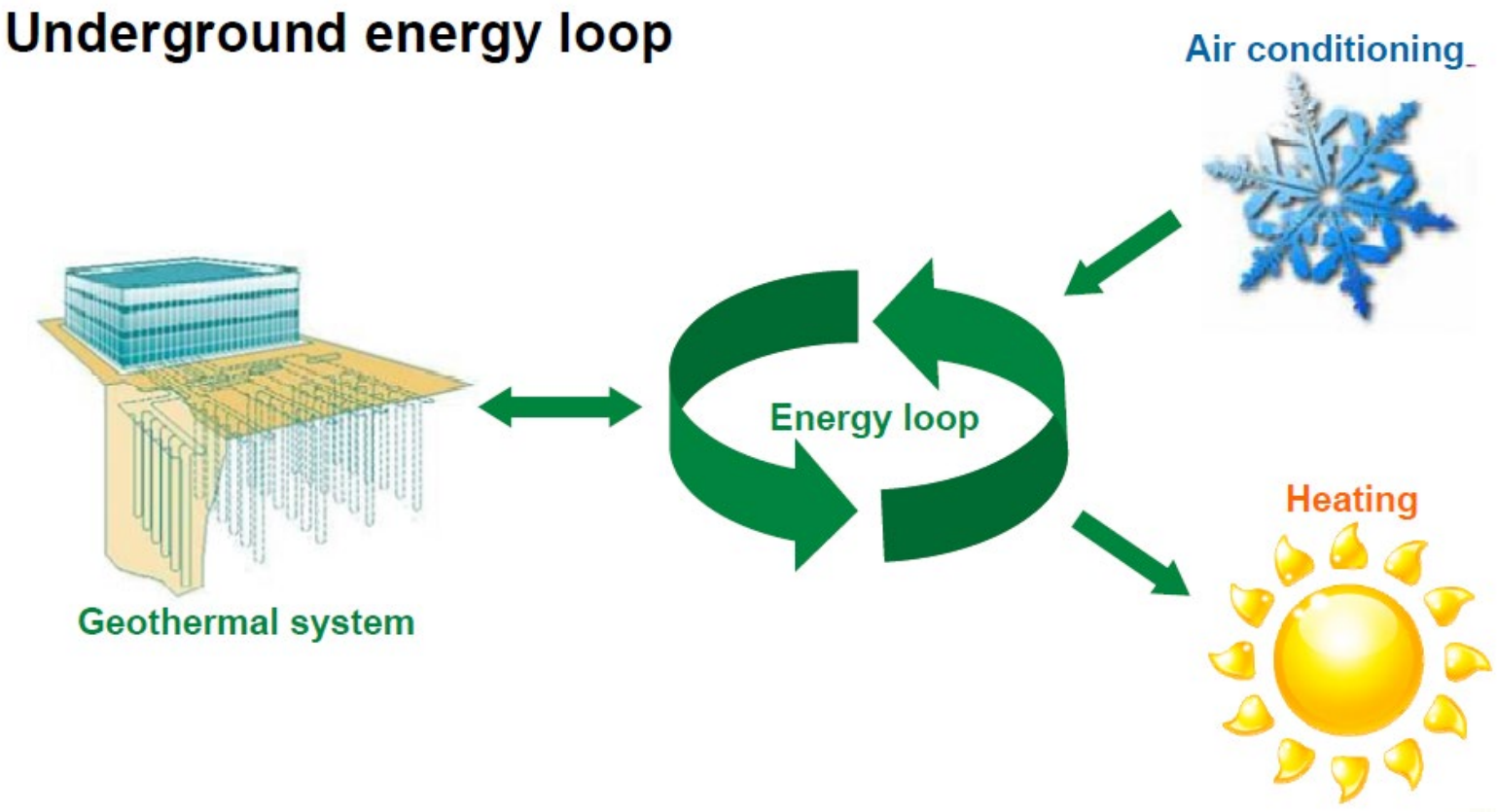
- GHG emission changes from 2007 to 2022 :
  - 50% reduction in 15 years
  - 52% reduction compared to the 'Business As Usual' scenario despite a 12% increase of building space

Geothermal system – change in the energy mix

Energy type (% of megajoule)	2006-07	2021-22
Oil	6%	< 1%
Natural gas	63%	36%
Electricity	31%	64%
Total	**100%**	**100%**

- Energy mix shift from 2007 to 2022:
  - The use of oil has been almost eliminated
  - The use of natural gas has been reduced by 57%
  - The use of electricity has more than doubled

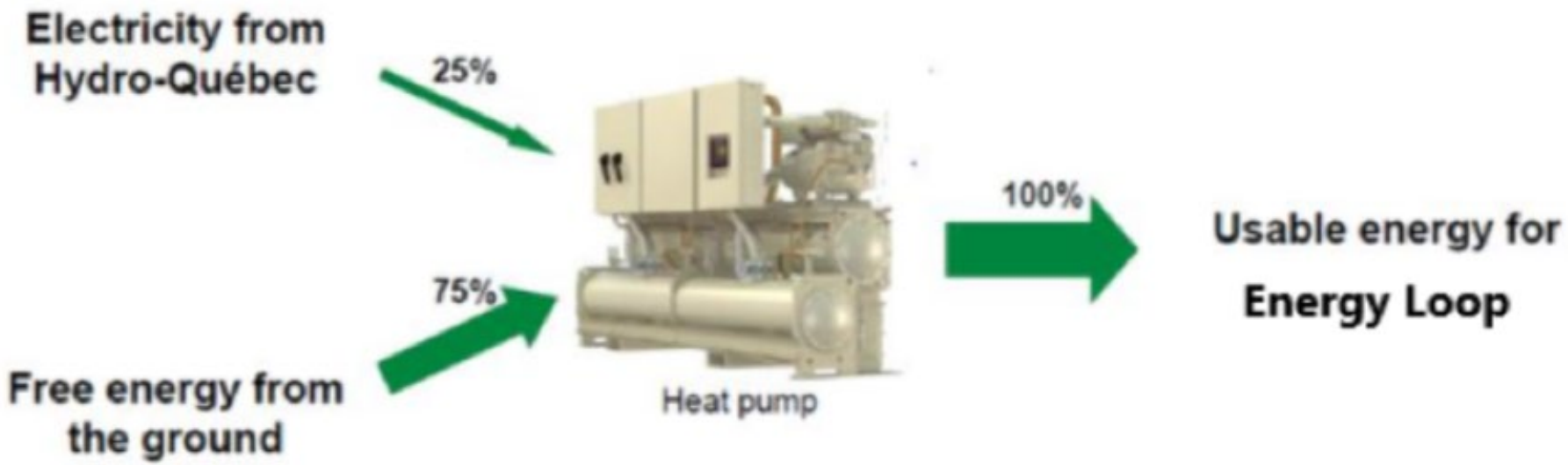
First geothermal urban district heating system in Canada



First geothermal urban district heating system in Canada

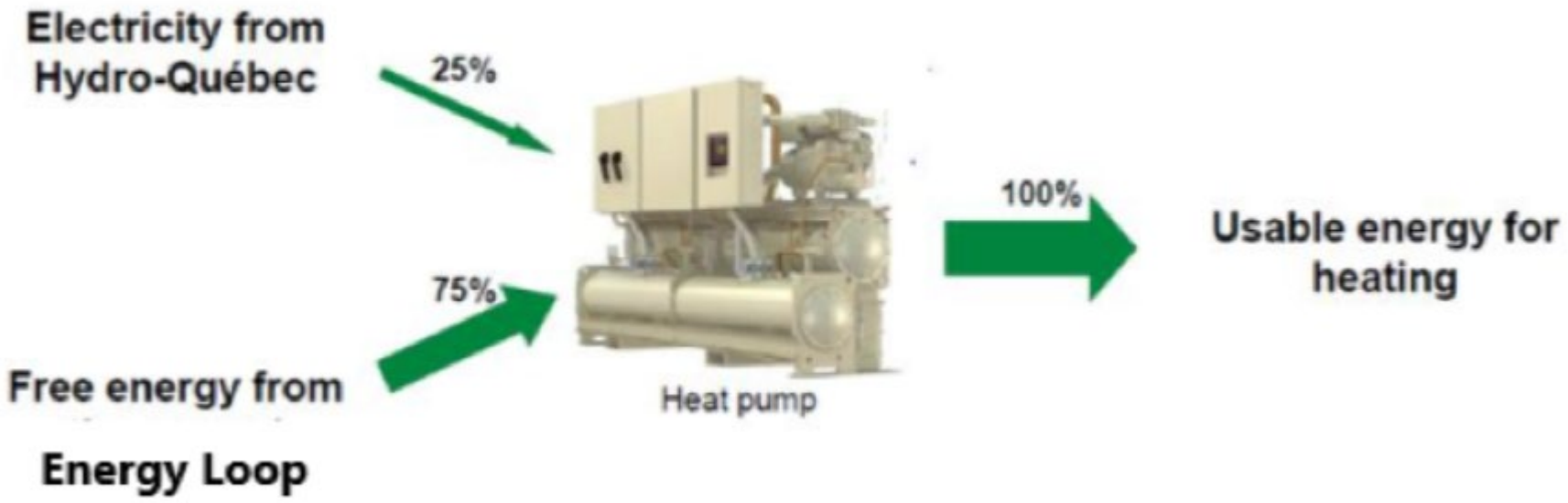
57 wells at a depth of 150 metres were installed below Abbott field in 2011

First geothermal urban district heating system in Canada



The new, hybrid heating system draws 25% of its power from Hydro-Québec and 75% from free underground thermal energy to create heat in the energy loop.

First geothermal urban district heating system in Canada



Then we use 75% of energy from the Energy Loop and 25% of electricity (or natural gas) to heat our buildings.

Carbon sinks

- The University mandated a firm (Addere) to assess its carbon sinks
- While carbon sinks are not considered in measuring reductions in GHG emissions, it is important to evaluate carbon sinks and communicate their importance to preserve our green spaces
- Two main sources of carbon sinks were evaluated: forests on campus and the land at the Johnville Bog and Forest Park which is co-owned with the *Université de Sherbrooke*

Location	Carbon sinks in tons of CO_2e per year
Trees on campus	456
Land at the Parc Ecoforester de Johnville	741
TOTAL	1,197

Achieving Net Zero Emissions through Carbon Offsets

- Fundao-Santa Clara Energetic Complex Project (FSCECP) – (Brazil)
- Project Objective : generation of zero carbon emission electricity from a renewable source – hydropower
- Hydropower Plant Capacity (122,4 MW) enable to sell electricity to the Brazilian grid, avoiding fossil-fueled energy use
- Bishop's will purchase 1,438 t CO_2e of CP2 Vintage Carbon Offsets @ USD 3.00/ton (total : USD 4,314 (approx. CAD $5,824)

United Nations
Carbon offset platform

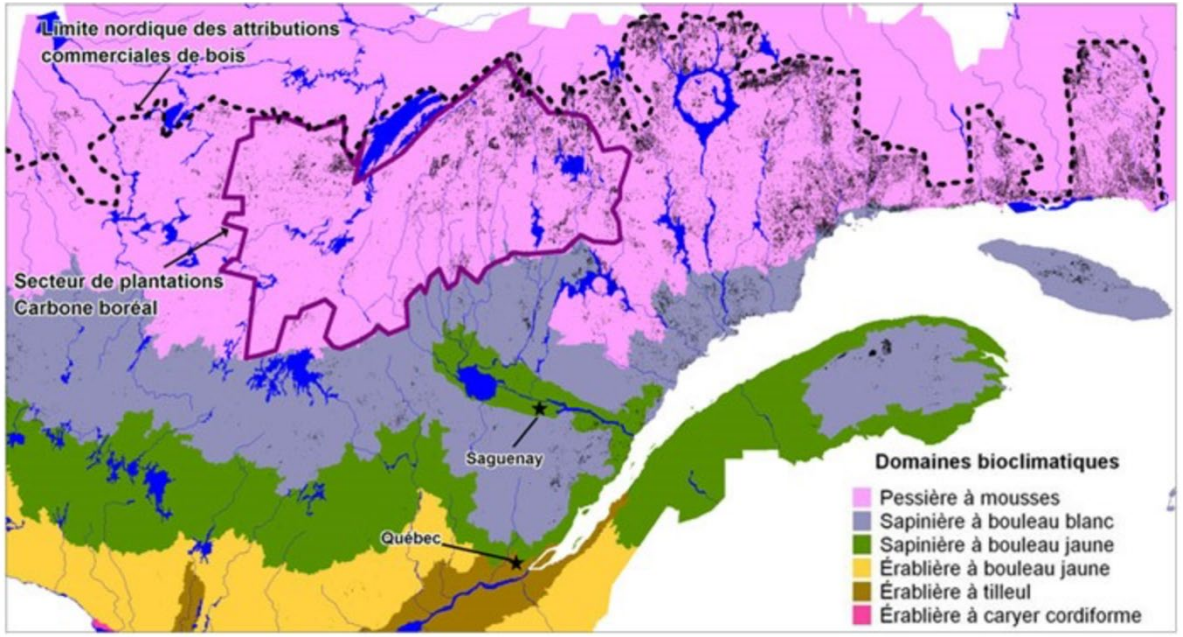
https://offset.climateneutralnow.org/fund-o-santa-clara-energetic-complex-project-fscecp-1279-?searchResultsLink=%2FAllProjects

Achieving Net Zero Emissions through Carbon Offsets

- The project is based on the sequestration of black spruce in the boreal forest. Plantations are verified by BNQ, an independent and accredited third party, in accordance with ISO14064-3

- Bishop's will purchase 480 t CO_2e of Quebec-based Carbon Offsets @ CAD 35.00/ton (total : CAD $16,800)

carbone boréal MD



https://carboneboreal.uqac.ca/en/faq-en/

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Achieving Net Zero Emissions through carbon offsets

Total carbon offset purchases :

Source	CO_2e offset		Cost (CDN)
	Quantity (tons)	Percentage	
Fundao-Santa Clara Energetic Complex Project	1,438	75%	$5,824
Carbone boréale	480	25%	$16,800
TOTAL	1,918	100%	$22,624

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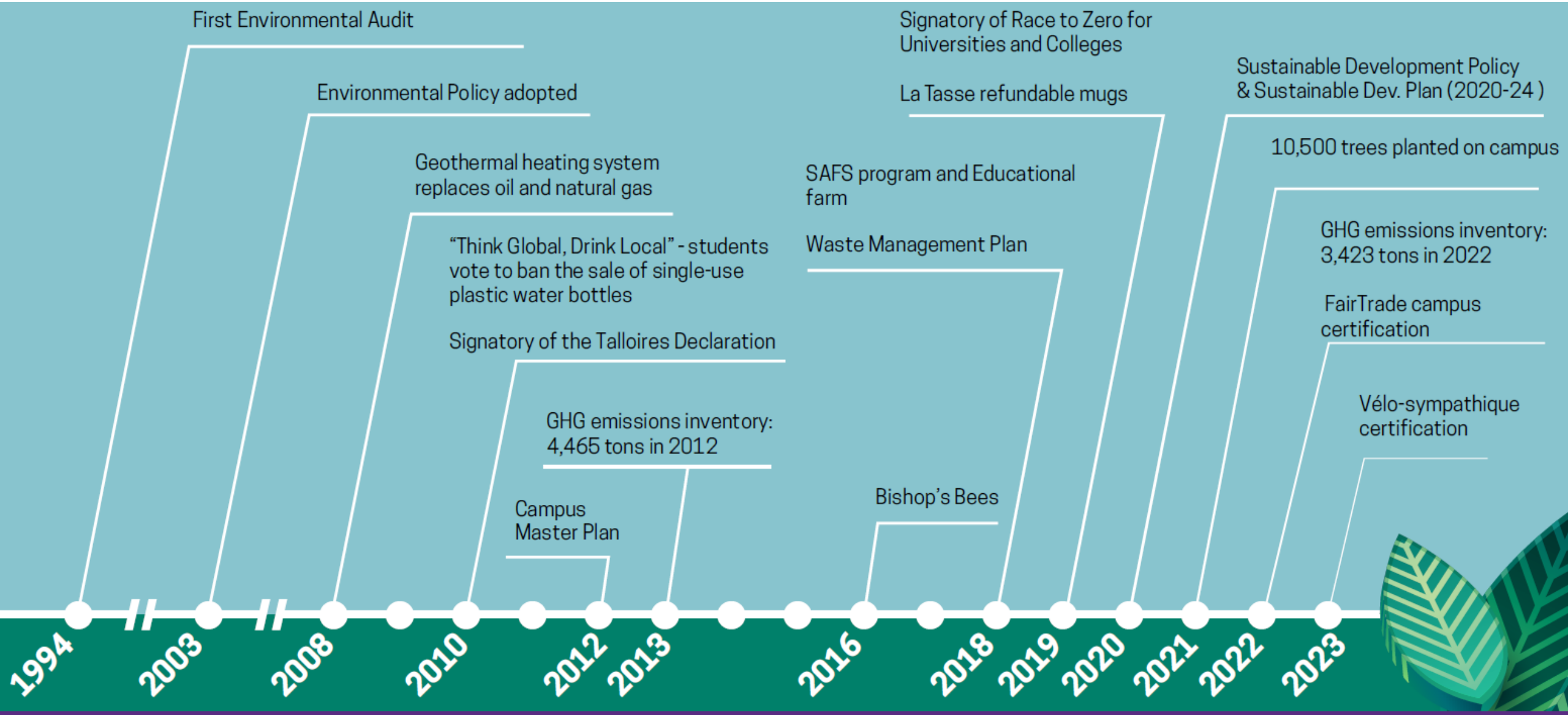
Evolution of sustainability at Bishop's



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Evolution of sustainability at Bishop's

1994 - First Environmental Audit on air quality, energy conservation and waste generation

2003 - First Environmental Policy adopted

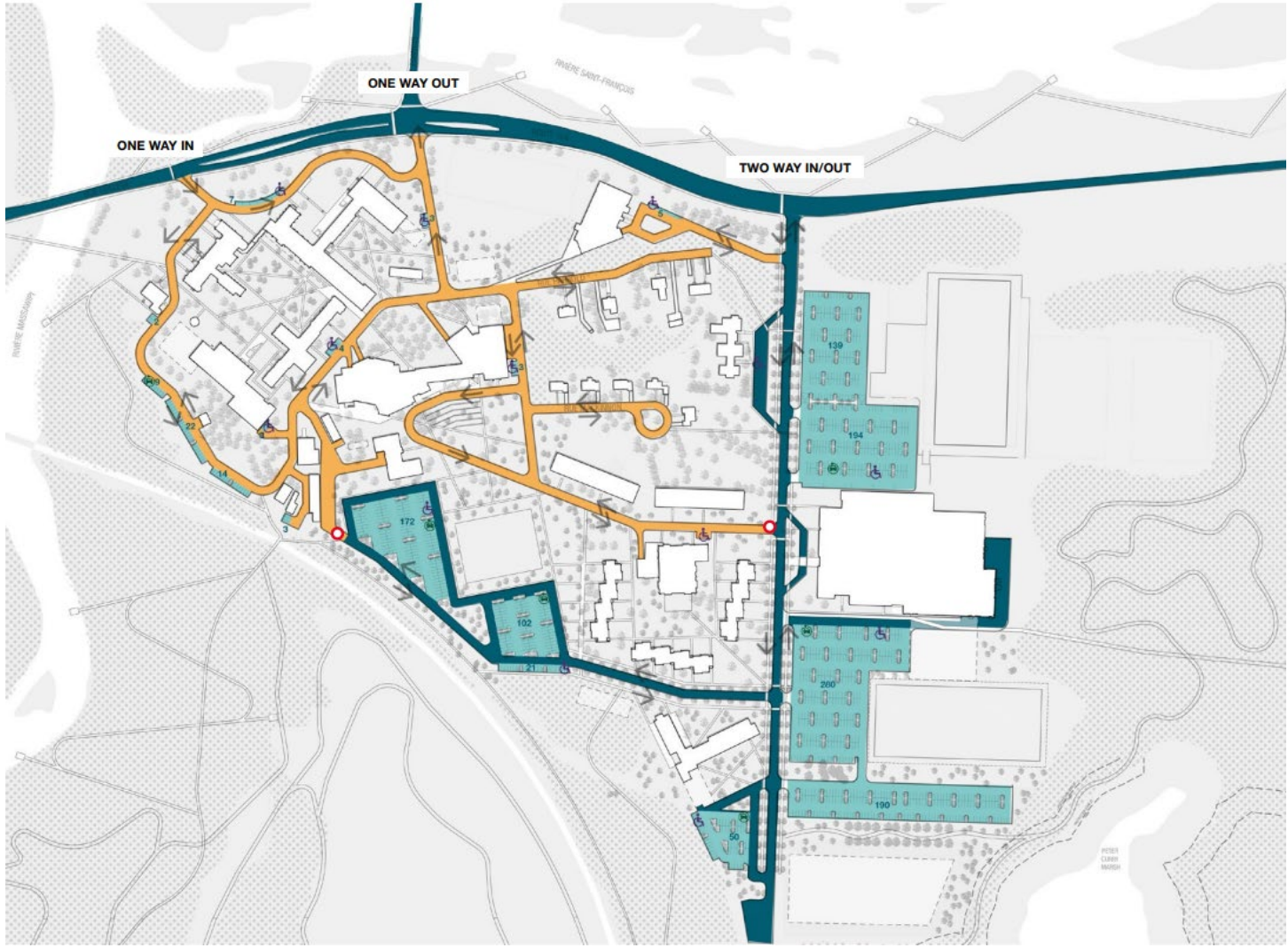
2008 – Start of the Geothermal Heating system project

2010 - Think Global, Drink Local - Students vote to ban the sale of single-use plastic water bottles

2012 - Campus Master Plan (revised in 2018)

Main goals:

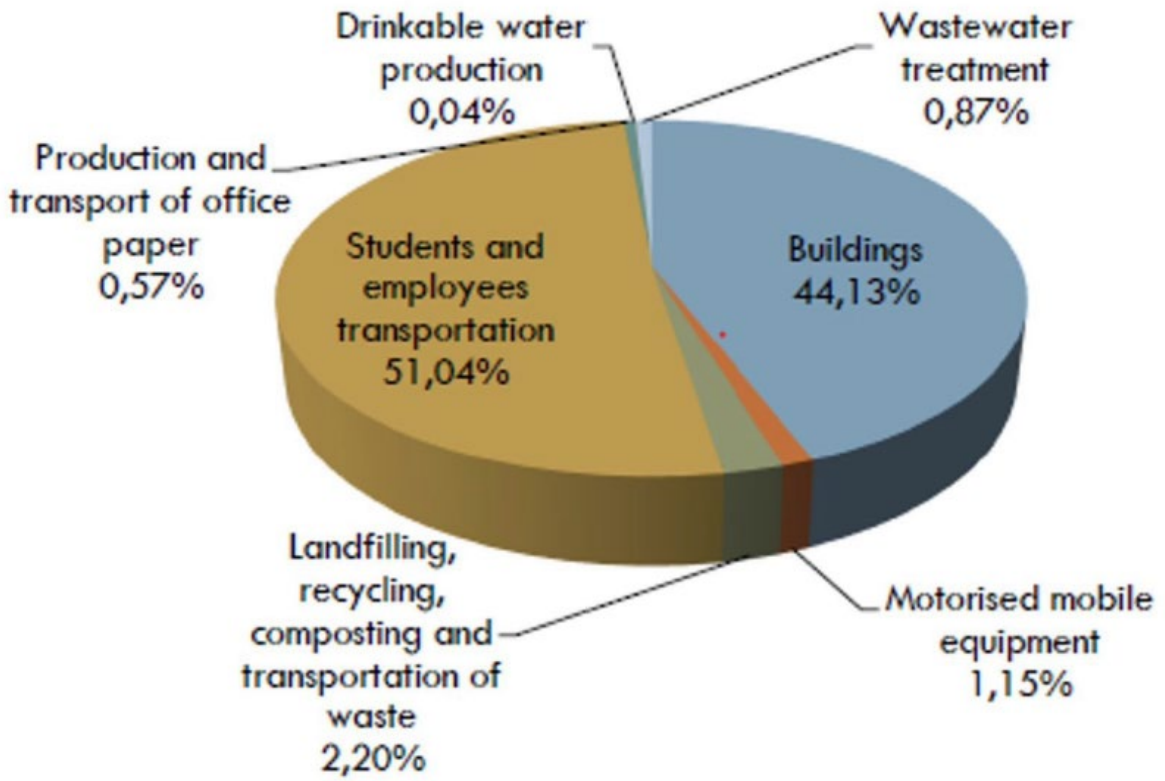
1) A walking campus
2) Reducing automobile circulation on the campus
3) Integrating Landscape with the campus
4) Connections and gathering spaces
5) Working with existing conditions



Proposed vehicular traffic and parking

https://www.ubishops.ca/about-bu/our-campus/campus-master-plan/

2012 - GHG Emissions Inventory – 4,465 tons CO_2e (for all scopes)



Bishop's University Greenhouse gas inventory report

- https://www.ubishops.ca/wp-content/uploads/Bishops-University-2012_GHG_Report_final.pdf

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2016 - Bishop's Bees

An apiculture club that promotes ecological bee keeping practices.

Students involved have the opportunity to learn hive management and honey extraction.

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2018 - Sustainable Agriculture and Food Systems (SAFS) program

The SAFS program emphasis is on improving the sustainability of all aspects of agriculture and food systems – focusing on the social, economic and environmental aspects of agriculture in order to help students develop a thorough understanding of food systems from farm to table and beyond.

2018 - Sustainable Agriculture and Food Systems (SAFS) program

Bishop's students built a mobile maple syrup production unit

They produced maple syrup from the sap of maple trees on the educational farm in the mobile maple sugar shack which was stationed in the University Quad

2018 - Waste Management Plan

The 3R principle (Reduce, Reuse, Recycle) is a hierarchy of waste management strategies to minimize waste.

Measuring rates of recycling, composting and waste is critical to set accurate reduction targets.

The first waste categorization was carried out in Fall 2021.

https://www.ubishops.ca/wp-content/uploads/Waste_Management_Program_Final.pdf

2019 - Race to Zero for Universities and Colleges

Pledge at the head-of-organization level to reach (net) zero GHGs as soon as possible, and by mid-century at the latest, in line with global efforts to limit warming to 1.5C.

https://www.educationracetozero.org/home

2019 - La Tasse refundable mug

Green Levy fund initiative in partnership with Sodexo

The Green Levy funds student-led sustainability projects and is a way for students to pursue their own sustainable development projects at Bishop's with the support of the Sustainable Development Student Intern (SDSI), the Students' Representative Council (SRC) and the University's Sustainable Development Advisor.

https://busrc.com/green-levy/

2020 - Sustainable Development Plan (2020-24)

1. Operate Bishop's University in an increasingly ecological and responsible manner
   - Reduce the amount of waste going to landfills
   - Reduce car circulation on campus
   - Become carbon neutral by 2030
   - Use our financial power in a responsible manner

2. Engage the Bishop's University community in improving its sustainable performance
   - Create awareness to incite action
   - Support grassroots projects
   - Make Bishop's a sustainability leader in the community at large

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2020 - Sustainable Development Plan (2020-24)

3. Instill curiosity about sustainable development through academic programs and research
    - Make visible what is invisible
    - Increase sustainability literacy
    - Increase sustainable development in research

4. Promote the well-being of our community through sustainable development initiatives
    - Increase food security
    - Support diversity, equity, and affordability

https://www.ubishops.ca/wp-content/uploads/SD_Plan_short.pdf

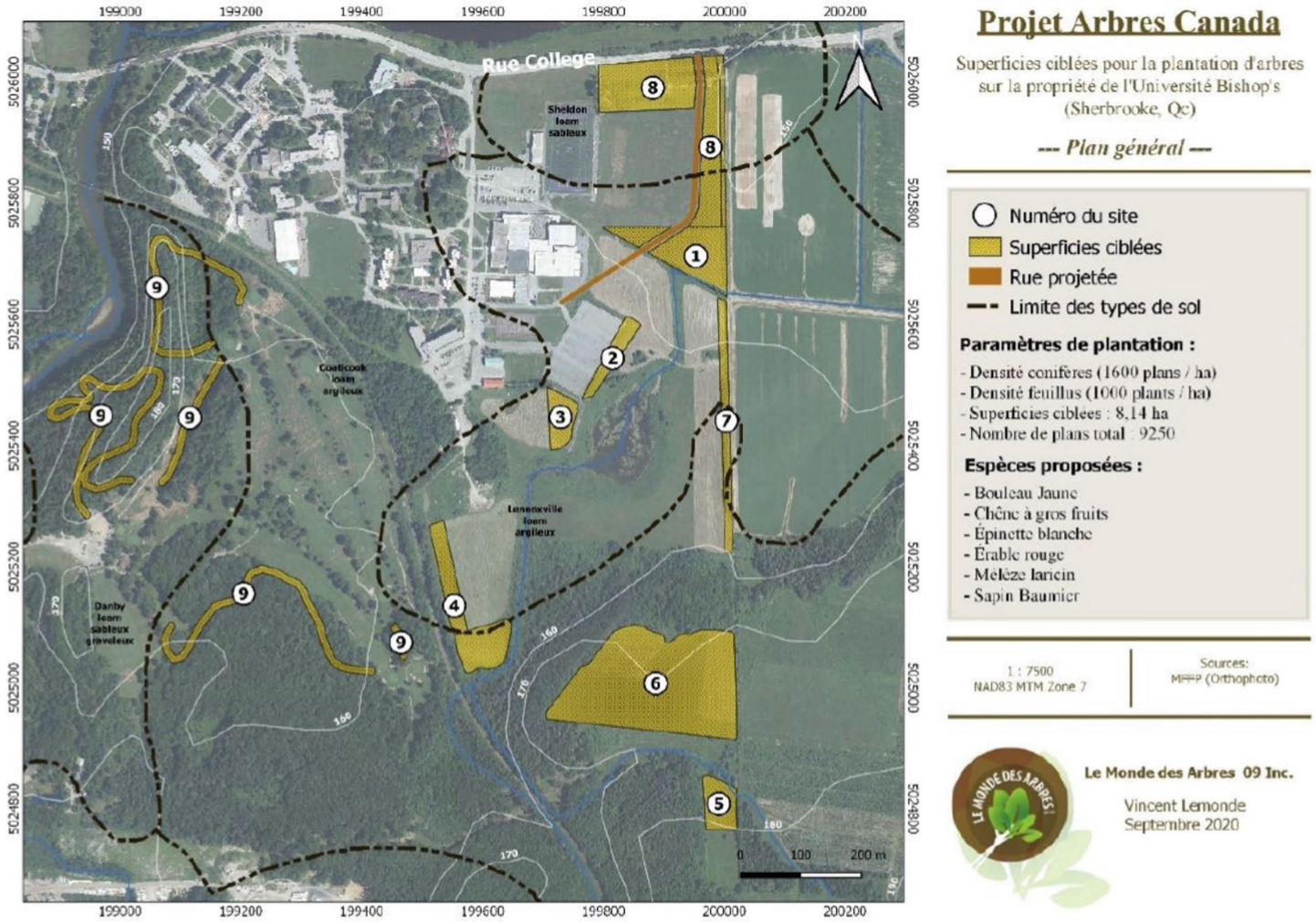
2021 - Tree planting project – phase I

Partnership with Trees Canada

Students in the BU Environmental Club and the Sustainable Agriculture and Food Systems program planted the 10,500 trees.

Care is taken to select local tree varieties:
Yellow Birch, Burr Oak, White Spruce, Red Maple, Tamarack, and Balsam Fir.

https://www.ubishops.ca/sustainable-development-at-bishops-university/



2021 - Treeplanting project – 10, 500 trees planted

2021 - Creation of the SD office

Laurence Williams – Sustainable Development Advisor

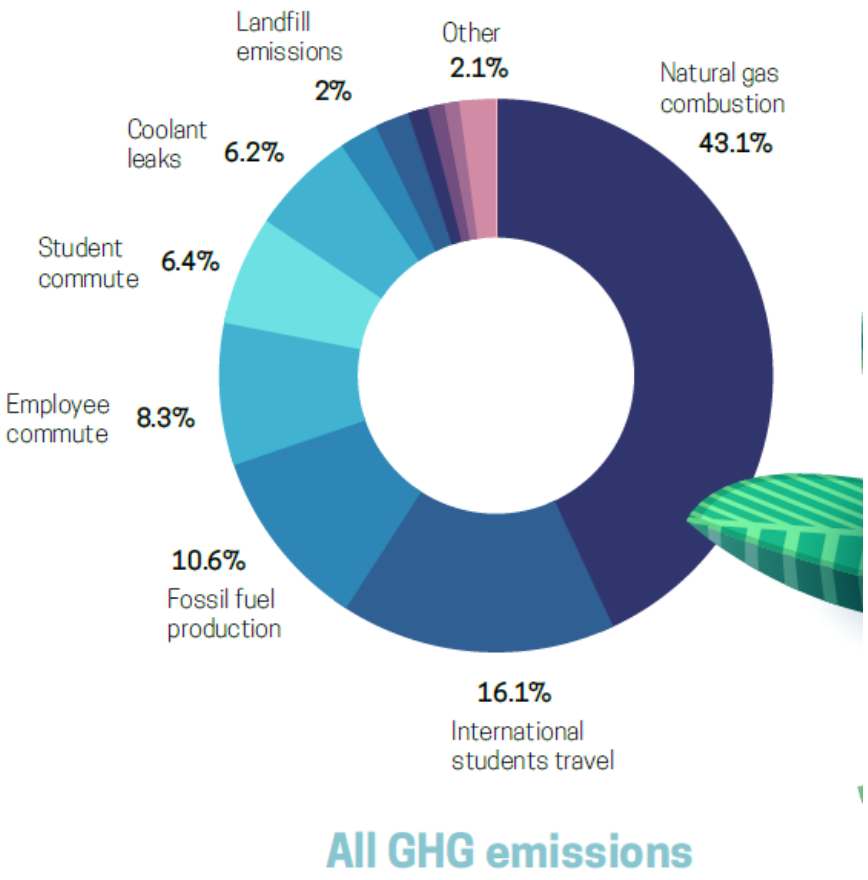
Laurence coordinates the actions and projects related to the implementation of the Sustainable Development Plan.

LWILLIAM@UBISHOPS.CA >

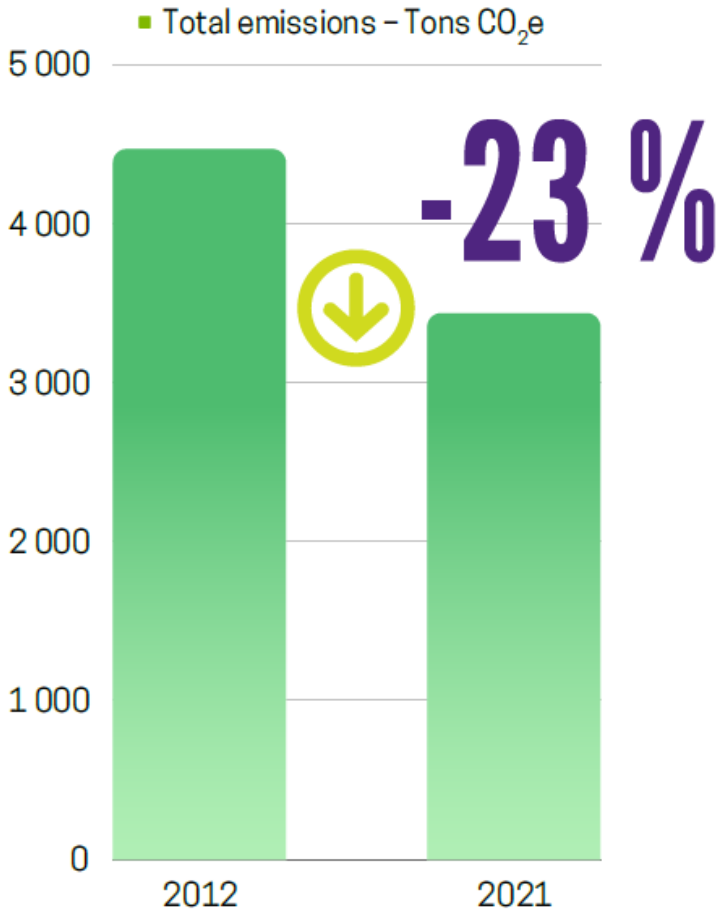
Danielle Storey & Ariane Horrall – Sustainable Development Student Interns (SDSI)

The SDSI role is made possible thanks to the generous contributions of the Elizabeth Harvey Memorial Sustainable Development Fund and the Kruger Inc. Sustainable Development Internship Fund.

2022 - GHG Emissions Inventory – 3,432 tons CO_2e (for all scopes)



All GHG emissions



The analysis was made following the ISO 14064-1:2018 norm

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2022 - Fairtrade Campus Certification

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2023 - Vélo Sympathique certification

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