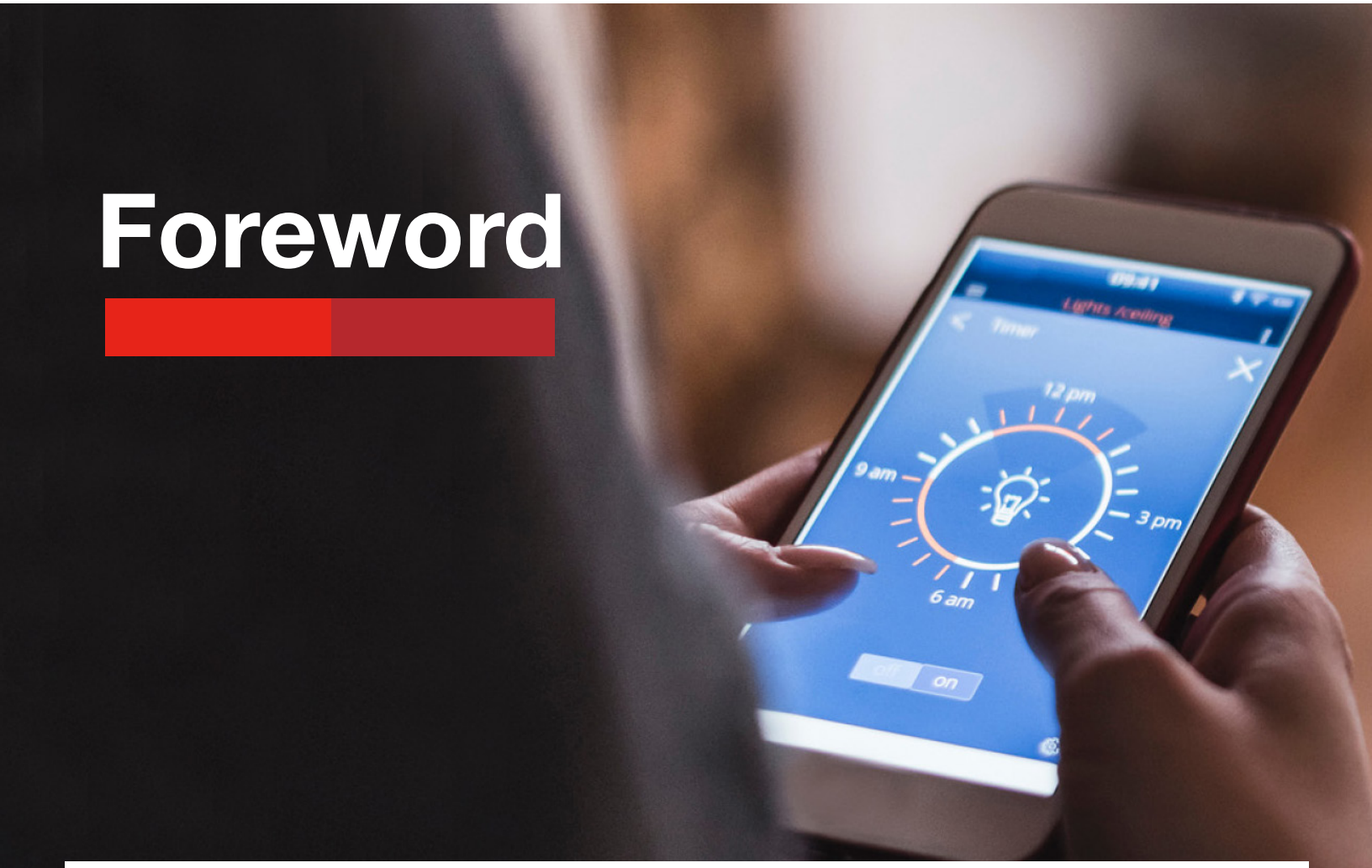
ROAD TO 2050

Greenhouse Gas Roadmap and Action Plan

FANSHAWE

Foreword



Fanshawe has been focused on energy conservation for more than three decades. Between 2005 and 2017, the College has invested in energy conservation, energy demand management and onsite renewable energy generation. These initiatives have resulted in over $15 million in energy savings and reduced Greenhouse Gas (GHG) emissions by 17,000 tons (tCO2e) which is equivalent to removing 3,200 cars or light trucks from use for one year.

To support the ongoing culture of conservation and sustainability at Fanshawe, the College has recently completed an ASHRAE Level 1 Energy Audit of each building as part of its Greenhouse Gas Reduction Roadmap. This audit assessed over 2.3 million square feet of Fanshawe's buildings located in London, St. Thomas, Simcoe and Woodstock. The findings of the energy audit and GHG Inventory form the basis for the principles discussed throughout this plan.

Our Team

Pictured (left to right): Shawn Harrington, Michelle Cong, Jenny Ruz, Peter Gilbert, Rich McEvoy, Tom Davis, Ivan Walker, Jamie Calvert, Nathan Gerber, Danielle Villeneuve. Not pictured: Amanda Whittingham

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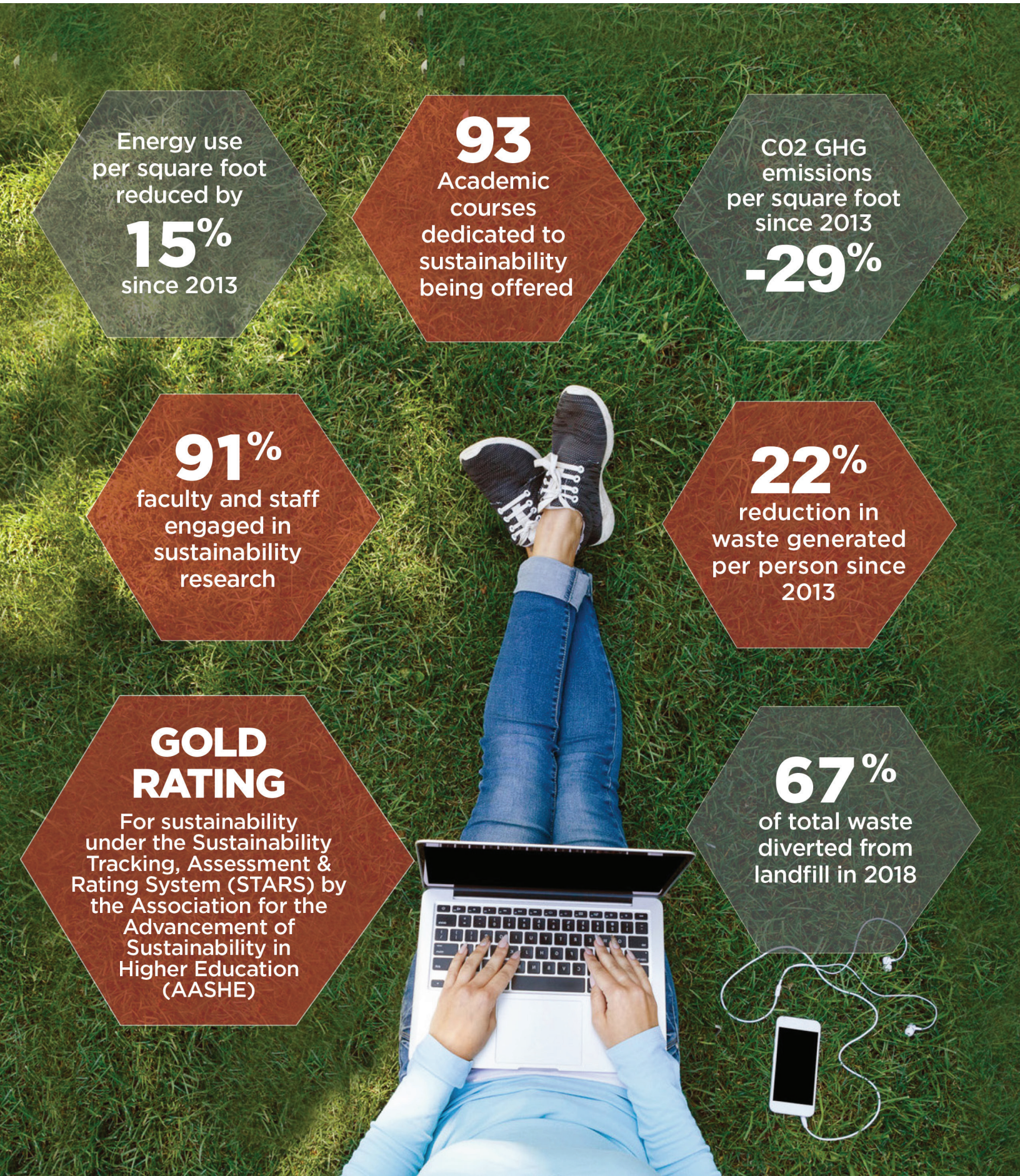
Energy, Greenhouse Gas & Sustainability Achievements


Energy use per square foot reduced by
15%
since 2013
93
Academic courses dedicated to sustainability being offered
C02 GHG emissions per square foot since 2013
-29%
91%
faculty and staff engaged in sustainability research
22%
reduction in waste generated per person since 2013
GOLD RATING
For sustainability under the Sustainability Tracking, Assessment & Rating System (STARS) by the Association for the Advancement of Sustainability in Higher Education (AASHE)
67%
of total waste diverted from landfill in 2018

Baselines & Targets

Fanshawe has chosen a baseline year of 2013 and aims to reduce its GHG emissions by 30% below baseline levels by 2030 and 80% by 2050.

Fanshawe has used the World Resources Institute's GHG Protocol, a global standard for GHG accounting, to define and quantify GHG emissions under three scopes:

Emission Type	Definition	Included in Scope
Scope 1	Direct emissions from sources owned or controlled by Fanshawe	Natural Gas, gasolne, diesel, refrigerants and fertilizers
Scope 2	Indirect emissions from the consumption of purchased electricity from the grid	Purchased electricity
Scope 3	Indirect emissions that occur in the value chain	Waste, air travel, paper use, student & faculty commuting

Fanshawe's GHG emission baseline and targets are summarized in the table below:

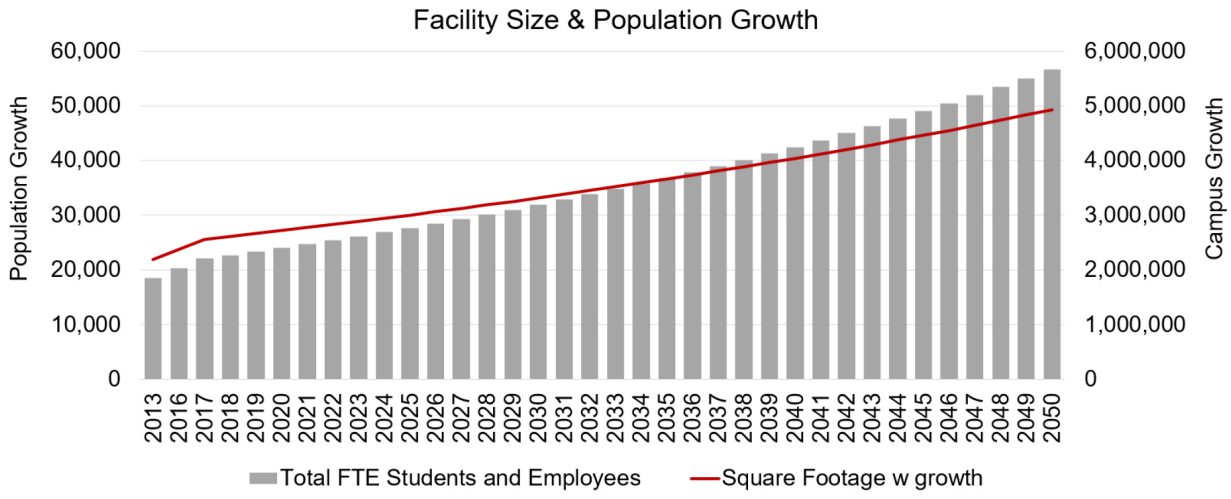
GHG Emissions (tCO2e)	Scope 1 & 2	Scope 3	Total
2013 - Baseline Emissions	6,309	13,873	**20,182**
2018 - Current Emissions	5,317	17,737	**23,054**
2030 Target (30% reduction from baseline)	4,416	9,711	**14,127**
2050 Target (80% reduction from baseline)	1,262	2,775	**4,037**

Growth

Fanshawe has chosen to reduce GHG emissions while accommodating future growth of the built environment and population.

The following assumptions were considered to model Fanshawe's forecasted emissions:

- Facility size will grow at an annual rate of 2%
- Full-time Equivalent student population will grow at an annual rate of 3%
- Full-time Equivalent employee population will grow at an annual rate of 1.5%



Fanshawe's expected growth for the milestone years is summarized in the table below:

Expected Growth	2030	2050
Facility size (sq. ft.)	3,315,005	4,925,924
Student Population (FTE)	29,601	53,463
Employee Population (FTE)	2,320	3,125

GHG Reduction Strategy Overview

Conservation & Demand Management:

Retrofit and optimize existing equipment to improve the energy efficiency of the built environment.

Space Optimization & Net Zero Buildings:

Optimize existing useable space, and construct High Performance buildings like LEED or Net Zero Carbon buildings as part of campus expansion.

Fleet & Facility Electrification:

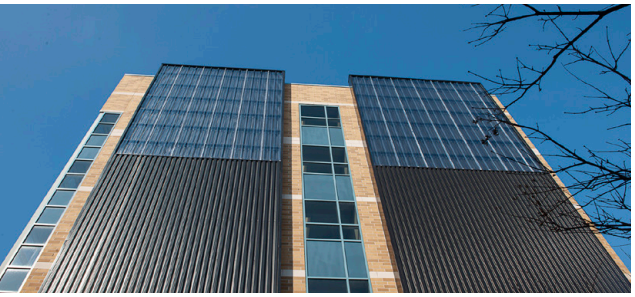
Reduce the use of natural gas, gasoline and diesel in college operations and replace or convert fossil fuel burning equipment to electricity.

Renewable Energy:

Generate and use more renewable power on campus such as solar and geothermal.

Energy Conservation & Demand Management

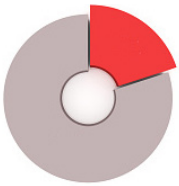
Investment in energy efficiency and conservation will reduce overall energy consumption, operating costs and GHG emissions.



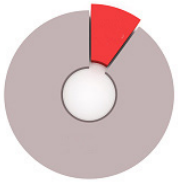
TARGET: To reduce GHG emissions from energy use per square foot of the built environment.

STRATEGY: Revise, maintain and implement a five-year Energy and Demand Management Plan with the specific focus on reducing the college's electricity and natural gas use.

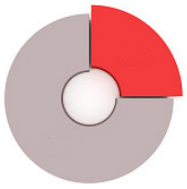
Fanshawe's previous Energy and Demand Management Plan was implemented starting in 2014 through 2018 and achieved the following:



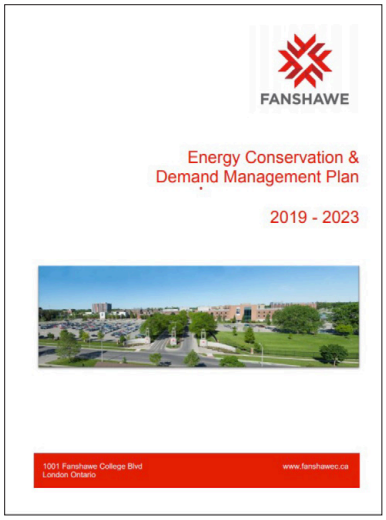
19.5% reduction in energy use



19.5% reduction in peak electric demand



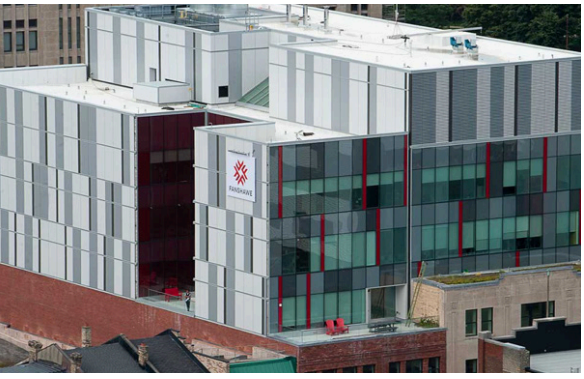
18.7% reduction in GHG emissions



Fanshawe's 2019 - 2023 ECDM Plan.

Space Optimization & Net Zero Carbon Buildings

Space optimization and low carbon design principles will enable Fanshawe's built environment to grow without increasing its GHG emissions.



TARGET: To ensure campus growth does not increase net GHG emissions.

STRATEGY:

1) Utilize Space Optimization techniques such as decentralized offices and space sensing technology to enhance smart building technology in existing buildings.

2) Ensure new building construction meet the Net Zero Carbon building standards.

A living wall biofilter at the Fanshawe School of Tourism, Hospitality and Culinary Arts.

Facility & Fleet Electrification

Convert or replace all on-site fossil fuel burning equipment to low GHG emission intensive electricity.

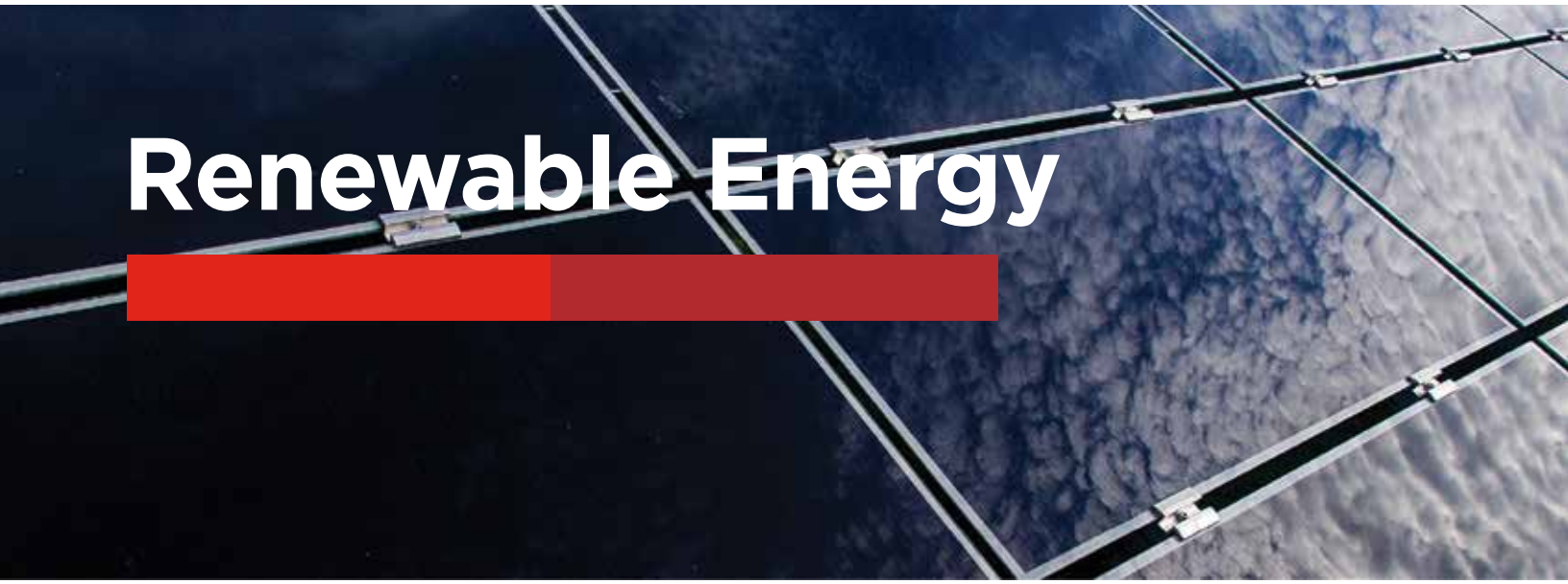
EV Charging stations at the Fanshawe College Aviation Centre.

TARGET: To eliminate the use of fossil fuels on campus where possible.

STRATEGY: Review and revise parking, housing and campus master plans periodically to accommodate electric vehicle chargers and to replace natural gas burning equipment (boilers, condensers, air units etc.) with electric equivalents.

All-Electric Nissan Leaf in Fanshawe's fleet.

On-site EV charging capability.



Renewable Energy

Increasing onsite renewable energy sources such as rooftop solar, car-port solar and geothermal installations can reduce Fanshawe's dependency on GHG intensive energy sources.

TARGET: To increase the share of renewable energy use on campus.

STRATEGY: Review and revise parking, housing and campus master plans periodically to identify feasible locations for solar and geothermal energy installations.

Solar walls and solar array at Fanshawe off-set about 285 tonnes of GHGs annually.

Campus as a Living Lab

Incorporating sustainability into campus operations will allow the facilities team to support and integrate operations with academics – further providing direct, real-world experience for students and enabling Fanshawe to function as a Living Lab.

As a Living Lab, the college will continue to provide the opportunity to study, experiment and develop sustainable solutions for the Fanshawe community and beyond.

Students at the Fanshawe Community Garden.

Experiential learning.

Students at the construction of a Green Roof.

Experiential learning Faculty members with beehives built by students.

Scope 3 Emissions Management

The implementation of a Sustainability Policy Cycle can help maximize Fanshawe's control over the broader Scope 3 emissions and reduce their overall impact on college operations.

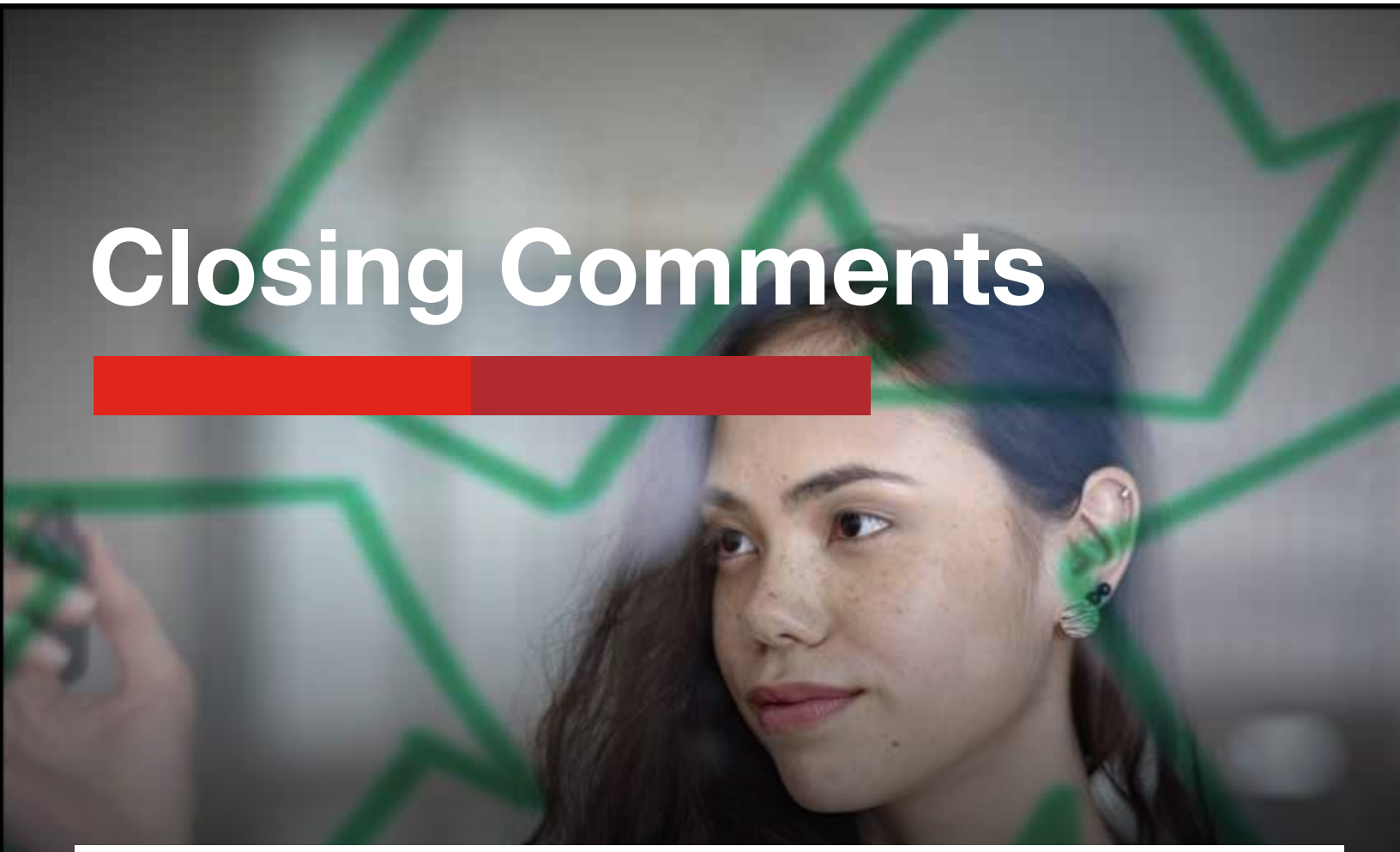
Scope 3 emissions are heavily influenced by social (student and employee) behaviour and the college's mode of conducting its operations. The following are the Scope 3 emission sources applicable to Fanshawe:

- Purchased Goods and Services
- Transportation and Distribution
- Waste Generated in Operations
- Business Travel
- Commuting
- Leased Assets

Although Fanshawe does not have complete control over its Scope 3 GHG emissions, the implementation of a Sustainability Policy Cycle can help maximize that control and reduce the overall impact of the emissions.

Waste Management	Provide incentives or discounts for faculty, staff and students who utilize reusable containers. Create a zero-waste policy or limit the use of single-use plastics on campus.
Support for Sustainable Transportation	Provide free or discounted parking and/or free or discounted electric charging for faculty, staff and students who use electric or hybrid vehicles or carpool to work. Provide a discounted transit pass for faculty staff and students. Create a bicycle-sharing program. Create preferred parking for fuel-efficient and electric vehicles.
Sustainable Investment	Create an internal carbon pricing mechanism whereby collected funds are invested in projects on campus that reduce campus-wide GHG emissions and support innovation.

Sustainability Policy Cycle being considered at Fanshawe.



Closing Comments

The intent of this plan is to understand the carbon intensity of Fanshawe's operations and identify opportunities to reduce the overall GHG emissions of the institution by setting short-term and long-term targets. The Facility Management team considers Fanshawe operations to be a primary source of education, and an integral part of the local community. The key to this relationship is being able to use the facilities efficiently and effectively to maximize the college's ability to provide the highest quality educational services while integrating environmental steward-ship into all aspects of facility operations.

The team understands that the road to decarbonization will be challenging and is dependent on various factors such as available technology, financial feasibility of projects, and social behaviour of the extended Fanshawe community. The team also understands that decarbonization is vital and is the means for Fanshawe to play its part in combatting climate change.

- The Fanshawe Sustainability Team