Environmental Sustainability Report

UNIVERSITY OF WATERLOO

2022

RELEASED OCTOBER 2022

UNIVERSITY OF WATERLOO

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Prepared by the President's Advisory Committee on Environmental Sustainability

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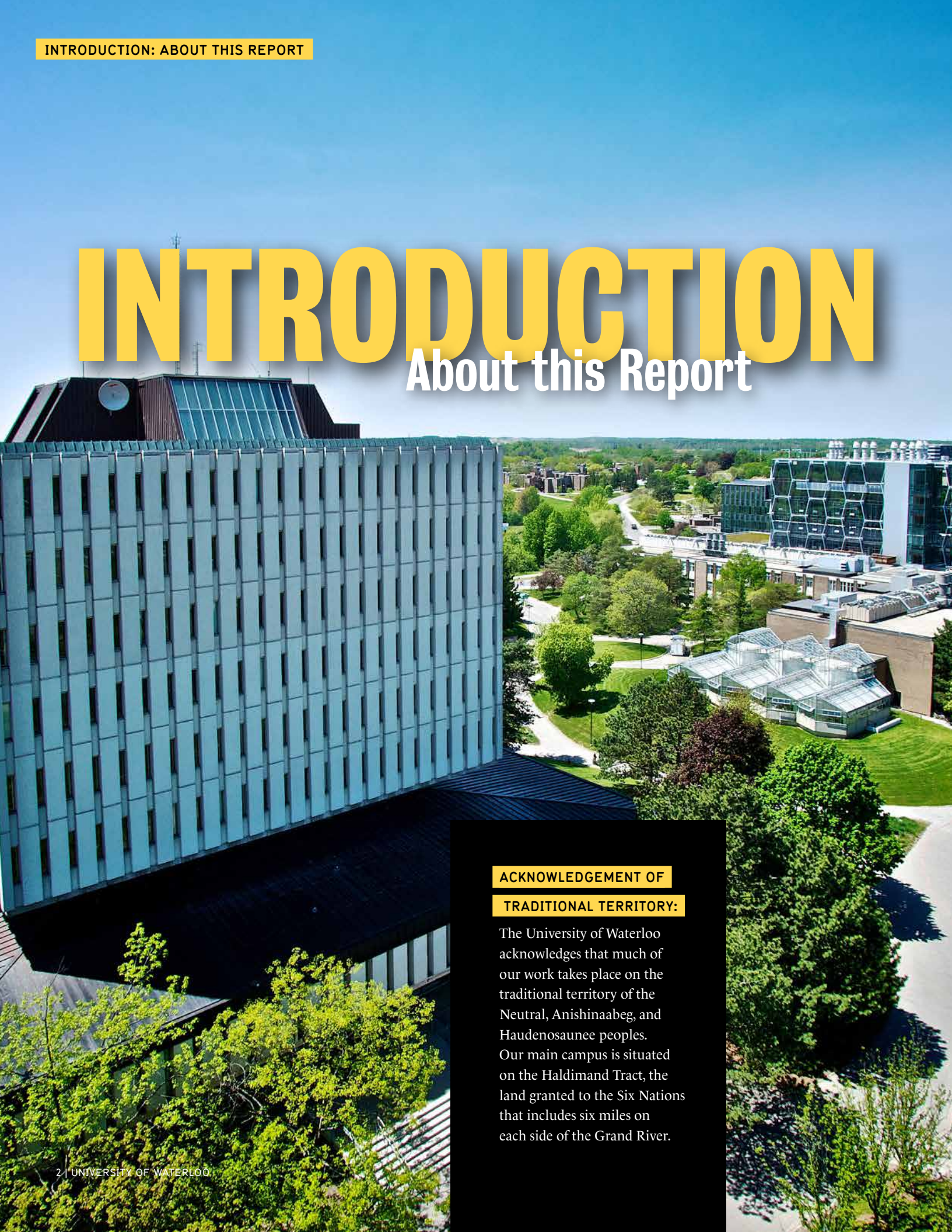
About this Report



ACKNOWLEDGEMENT OF TRADITIONAL TERRITORY:

The University of Waterloo acknowledges that much of our work takes place on the traditional territory of the Neutral, Anishinaabeg, and Haudenosaunee peoples. Our main campus is situated on the Haldimand Tract, the land granted to the Six Nations that includes six miles on each side of the Grand River.

Overview: This report highlights examples of progress towards each of the 27 objectives that were established in 2017 through Waterloo's Environmental Sustainability Strategy. The report has sections on Academics, Operations, and Engagement, and describes relevant projects and initiatives that have occurred at the University of Waterloo throughout 2021, up to and including June 2022.

Each objective includes a progress summary, as well as specific indicators that offer more information on the progress.

For full data and details on each objective and indicator, consult the interactive data dashboards and methodologies, available at ***uwaterloo.ca/sustainability/report***

Definitions: By definition, sustainability means maintaining the integrated health of the environment, society, and economy for today and into the future. While this report focuses primarily on environmental indicators relevant to the University of Waterloo, it recognizes that there are mutually reinforcing connections with financial and social sustainability. For brevity, the term "sustainability" will refer to environmental sustainability in this report.

Framework: The University of Waterloo aligns the action areas and data within this report and within the Environmental Sustainability Strategy to those of the Sustainability Tracking, Assessment, and Rating System (STARS) developed by the Association for the Advancement of Sustainability in Higher Education (AASHE).*

Sustainable Development Goals: Within the report, the University of Waterloo also maps its actions towards advancement of the global United Nations Sustainable Development Goals (UN SDGs). Additional detail on pan-University efforts related to the SDGs can be found at ***uwaterloo.ca/sustainable-development-goals***.

Reporting Boundary: This report covers all University of Waterloo campuses, unless otherwise noted. The report data and indicators do not include information from Affiliated and Federated Institutions of Waterloo (AFIWs), although information from the AFIWs is included as separate disclosures in the interactive data tables.

Contact: Please address any questions about this report to the Sustainability Office (***sustainability@uwaterloo.ca***).

[1] For full details on STARS, see Association for the Advancement of Sustainability in Higher Education. stars.aashe.org

INTRODUCTION

Message From the President

Throughout the University of Waterloo's history, we have excelled at developing new ways to approach education, at building deep expertise in emergent social, technological, and environmental topics, and at taking smart risks and pushing boundaries.

The climate and sustainability crisis is at the top of the list of global challenges in need of innovation and action. This urgency is reflected in Waterloo's Strategic Plan, Environmental Sustainability Strategy, and Climate Action Plan. Together, they act as both guides and calls to action for tackling this crisis in every facet of campus activity.

This report summarizes the sustainability actions we have taken over the past year, and captures the progress we have made on previous sustainability-related commitments. With this release we hope to demonstrate transparency, hold ourselves accountable, and also to celebrate our accomplishments in teaching, research, and practice.

In 2021 and 2022, Waterloo launched new academic programs, started new initiatives to engage the community, and made investments in an array of projects to reduce energy consumption. These efforts have helped us reduce emissions, improve waste diversion, and push more of our targets toward completion. My heartfelt thanks to the many hundreds of staff, faculty, and students who championed these initiatives.

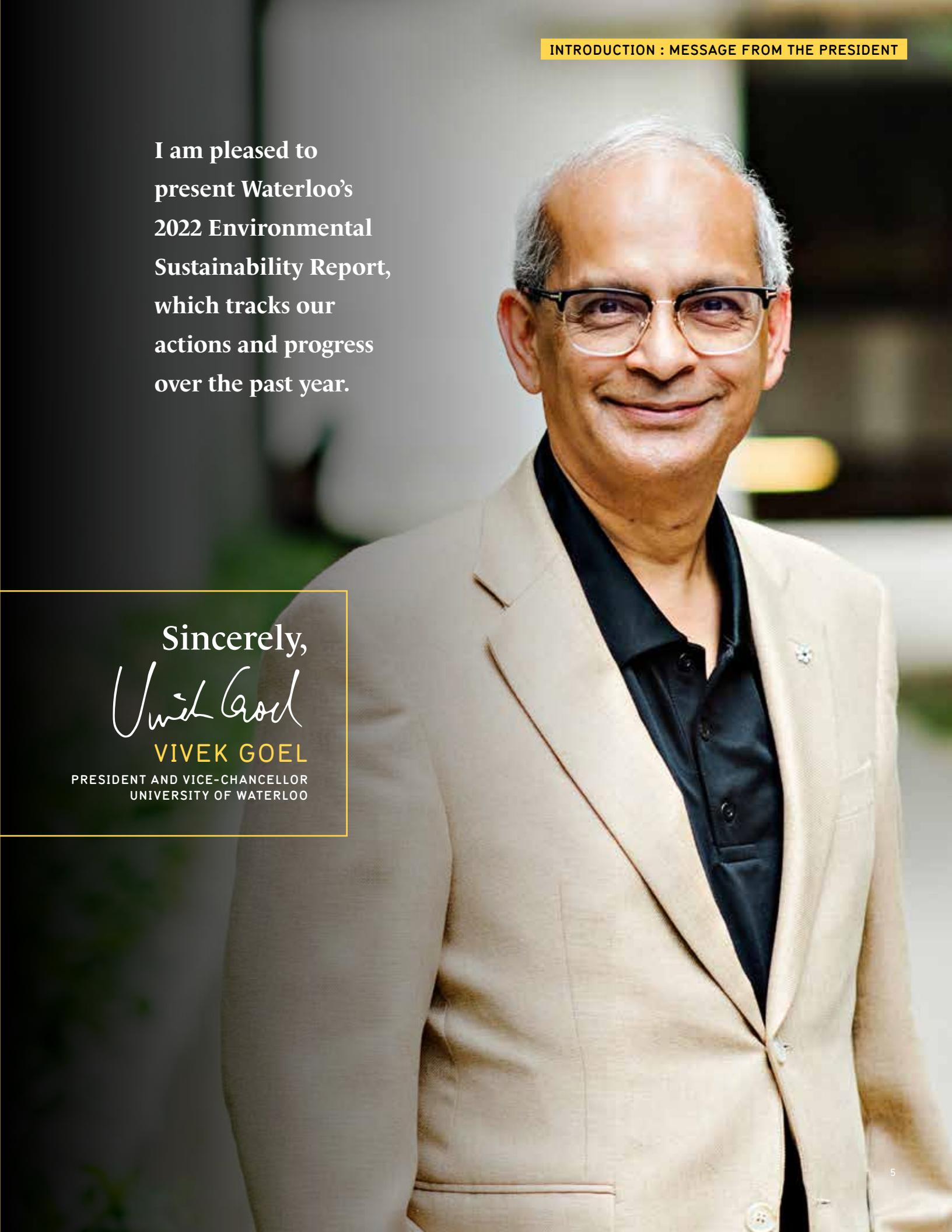
And clearly so much more is needed – on campus, in Canada, and around the globe.

Economic and public policy transitions to a low-carbon, circular economy are gaining speed, and organizations across every sector must keep pace or risk ceding reputation, talent, funding, and trust to those who will. As a Canadian leader in cooperative learning, technology, and entrepreneurship, it is imperative that Waterloo lead in sustainability as well.

Accelerating campus action on true sustainability in the year ahead will take a commitment from everyone, and we will be reaching out across the campus community to build this momentum through shared responsibilities.

We recently celebrated the creation of the new Sustainable Futures research initiative, linking together tremendous sustainability expertise across a range of Waterloo research institutes. This is emblematic of the collective action we can take to transform both ourselves and the world around us to achieve the future we want.

I hope this report helps you reflect on our progress and our incredible potential.
Thank you for your ongoing support.

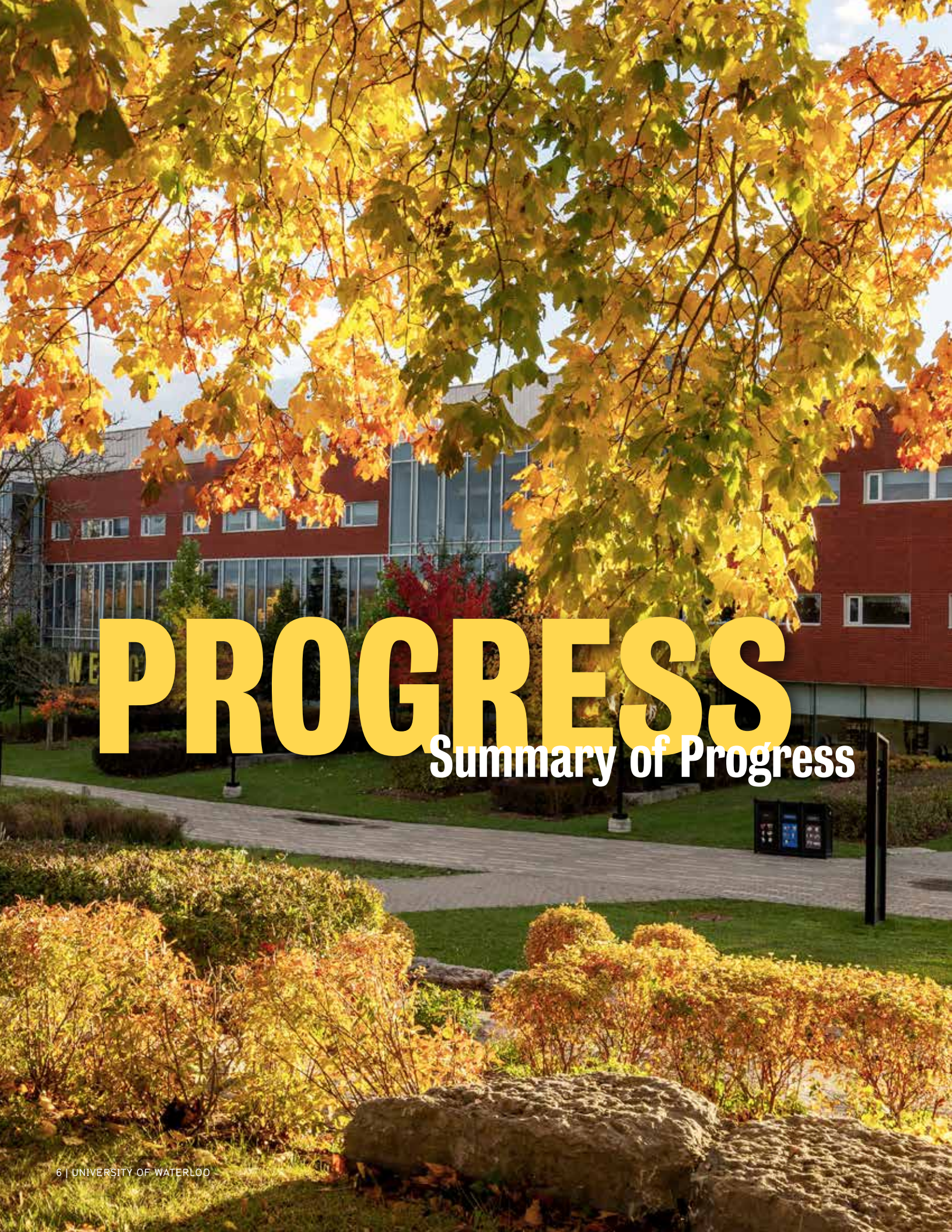


I am pleased to present Waterloo's 2022 Environmental Sustainability Report, which tracks our actions and progress over the past year.

Sincerely,

VIVEK GOEL

PRESIDENT AND VICE-CHANCELLOR
UNIVERSITY OF WATERLOO



PROGRESS

Summary of Progress

At a Glance

OVERALL

10/27 Sustainability Strategy Objectives Completed

17/27 Sustainability Strategy Objectives in Progress

SILVER
Rating through the Sustainability Tracking, Assessment, and Rating System
AASHE 2021

53rd
THE Impact Ranking on the UN SDGs, Globally
THE 2022

BE A LEADER IN SUSTAINABILITY EDUCATION AND RESEARCH

>360 Researchers exploring the UN SDGs

HOST
Canada-wide SDG Network

>680 Academic courses related to the UN SDGs

6 University research centres/ institutes with sustainability focus

OPERATE THE CAMPUS SUSTAINABLY

33% Reduction in water intensity since 2015

FAIR TRADE
Designated campus since 2019

8.6% Scope 1+2* emissions reductions since 2015

35.8% Waste diverted from landfill

25% Food sustainably sourced or certified

EMBED SUSTAINABILITY IN CAMPUS CULTURE

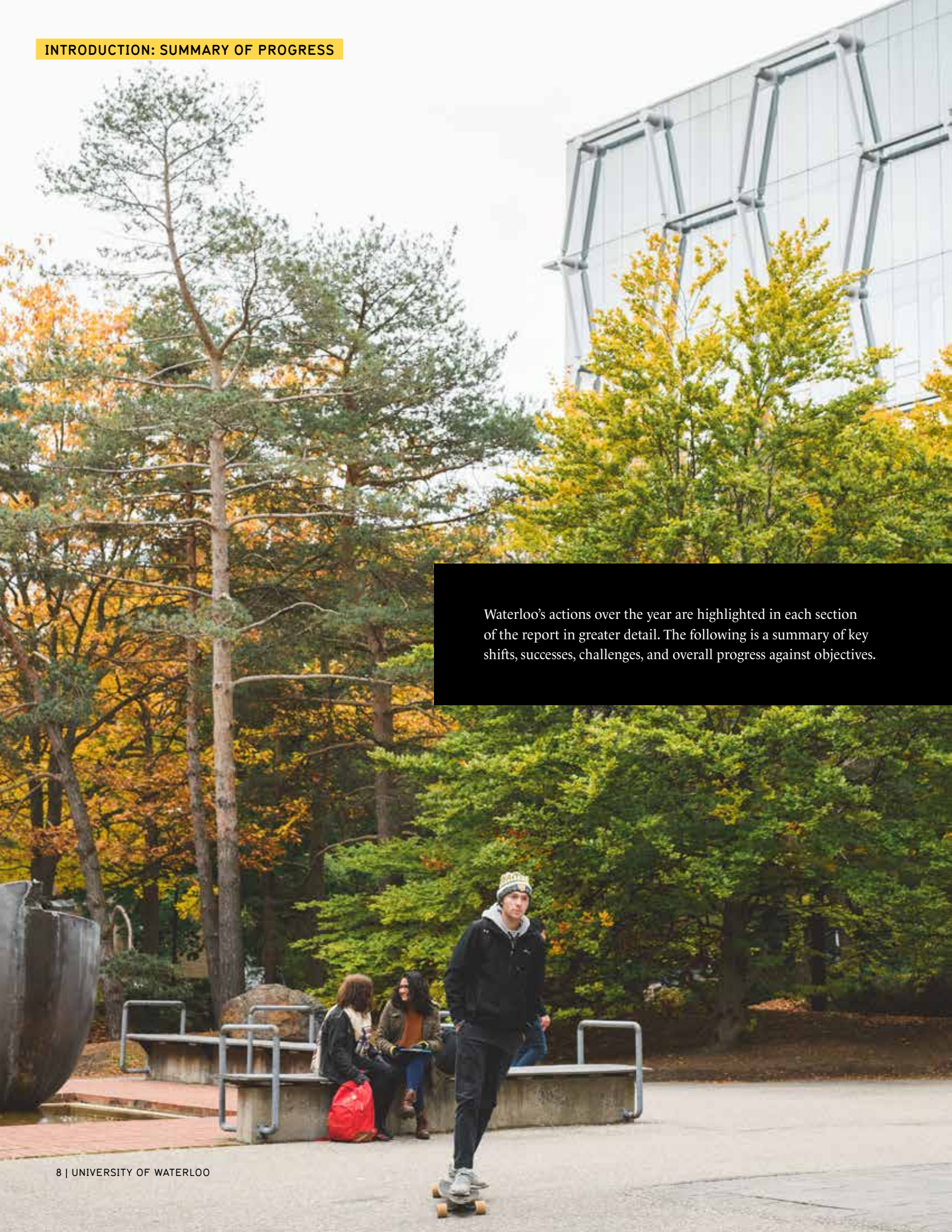
7 Students sustainability leadership pathway opportunities

18% Departments Green Office Certified Bronze or higher

6% Employees completed the Sustainability Certificate Training

4 Local community sustainability awards since 2016

*refers to direct and energy-related emissions, respectively



Waterloo's actions over the year are highlighted in each section of the report in greater detail. The following is a summary of key shifts, successes, challenges, and overall progress against objectives.

KEY SHIFTS

› Aligned measurements of sustainability in **curriculum and research more closely with the SDGs;**

› Increased **waste diversion to 35.8 per cent**, with a promising year-over-year increase;

› Decreased direct and energy-related **emissions by 8.6 per cent** against the 2015 base year (this is a major positive shift, but is driven largely by pandemic-related and weather changes);

› Resumption of in-person activity began to **increase travel emissions**, though more information is necessary to quantify.

KEY SUCCESSES

› Continued **academic innovation**, with new programs of study and clusters of research expertise, and continued partnership and knowledge mobilization efforts;

› Introduced **guidelines for New Building Design and for Lifecycle Costing**, aligning decision-making and setting expectations toward sustainable outcomes;

› **Invested in preliminary climate and energy actions** to advance the *Shift*:Neutral climate action plan and catalyze early projects that can reduce emissions;

› Released report with a focus on **initiatives supporting the UN Sustainable Development Goals**, building awareness of the holistic and interconnected nature of sustainability action on campus;

› **Launched Green Labs pilot** to complement Green Residence and Green Office programming in providing engagement opportunities across campus.

PROGRESS AGAINST OBJECTIVES

The tables below summarize the number of Environmental Sustainability Strategy objectives at various stages of completion, including those with tentative/temporary fluctuations, as of June 2022.

KEY CHALLENGES

› Waterloo is **moving too slowly on emissions reductions** to reach the 2025 target. The necessary level of resources and capacity have not been mobilized;

› Members of the campus community face **capacity and "change fatigue" challenges** coming out of the enormous strain of the pandemic. This raises barriers at exactly the time when robust change management practices and major pivots are needed;

› **Increasing supply chain risks** are putting pressure on implementation costs for many projects, and may temporarily shift decision-making to focus on availability rather than quality and long-term value;

› **Sustainability considerations are not internalized** across various parts of the institution, and many systems and structures continue to enable or even incentivize decisions that are not aligned with strategic goals.

KEY PRIORITIES

› To reach Waterloo's climate, waste, and transportation targets, the campus needs to develop strategies to **mobilize resources and capacity** for project implementation;

› To align decisions toward shared outcomes, Waterloo needs to **create clearer expectations, guidelines, and processes** that address system structures;

› To support action, Waterloo must continue to **engage and empower stakeholders** with tools and resources to improve sustainability in their teams and peer groups, both among academic departments and non-academic departments.

STATUS	2019	2020	2021	2022
Not started	1	1	0	0
Started	6	8	5	3
Somewhat completed	12	6	4	6
Mostly completed	4	9	9	8
Completed	4	3	9*	10*

*Including those that may be temporary due to pandemic influences

INTRODUCTION: SUMMARY OF PROGRESS

A - ACADEMICS

O - OPERATIONS

E - ENGAGEMENT

G - GOVERNANCE

SUSTAINABILITY OBJECTIVE	STATUS
TEACHING & LEARNING	
A1: By 2019, ensure undergraduate students from any program of study will have the opportunity to learn about sustainability in their courses.	Complete
A2: By 2025, identify and implement flexible strategies for 5 programs of study to more deeply integrate sustainability within the curriculum.	Somewhat complete
A3: By 2025, every startup emerging from supporting programs at Waterloo will have access to tools and training to embed sustainability into their emerging business plans and models.	Started
RESEARCH	
A4: By 2020, celebrate sustainability research as a core thematic strength of Waterloo's reputation and identity.	Somewhat complete
A5: By 2025, become a world leader for research excellence in 5 sustainability related themes.	Somewhat complete
A6: By 2025, establish Waterloo as a "go-to" hub for knowledge and expertise on sustainability challenges.	Mostly complete
A7: By 2018, implement 3 new sustainability-related projects annually on campus using faculty and student expertise; by 2025, implement at least 8 new projects annually.	Complete ('18) Somewhat complete ('25)
ENERGY AND CLIMATE	
O1: By 2019, develop a long-term Climate and Energy Action Plan to achieve carbon neutrality by 2050; achieve a 17.5 per cent reduction in emissions by 2025.	Complete ('19) Somewhat complete ('25)
O2: Implement cost-effective and practical strategies to reduce or minimize growth in energy use on campus.	Started

SUSTAINABILITY OBJECTIVE	STATUS
WASTE	
O3: By 2025, achieve a 60 per cent diversion rate; by 2035, become a zero-waste (90 per cent diversion rate) campus.	Started
WATER	
O4: By 2025, reduce water intensity by 5 per cent per square metre from a 2015 baseline.	Complete
O5: By 2025, expand the deployment of stormwater management technologies to targeted areas.	Mostly complete
TRANSPORTATION	
O6: By 2025, increase to 90 per cent the proportion of sustainable commuting trips from a 2016 baseline of 85 per cent.	Complete
O7: By 2020, increase electric and alternative-fuel vehicle use on campus.	Complete
O8: By 2025, reduce fossil fuel consumption across the campus fleet by 25 per cent from a 2015 baseline.	Complete
GROUNDS	
O9: By 2025, all University grounds will be maintained according to sustainable landscaping standards, and plans developed for remediation and preservation of specific natural areas of concern.	Mostly complete
FOOD SYSTEMS	
O10: By 2025, 40 per cent of all Food Services food and beverage purchases are produced on-site, locally, or are third-party certified for sustainability.	Mostly complete
O11: By 2018, achieve and maintain a Fair Trade Campus designation.	Complete
O12: By 2020, deliver multifaceted programming to grow student and employee awareness about healthy and sustainable food choices.	Complete

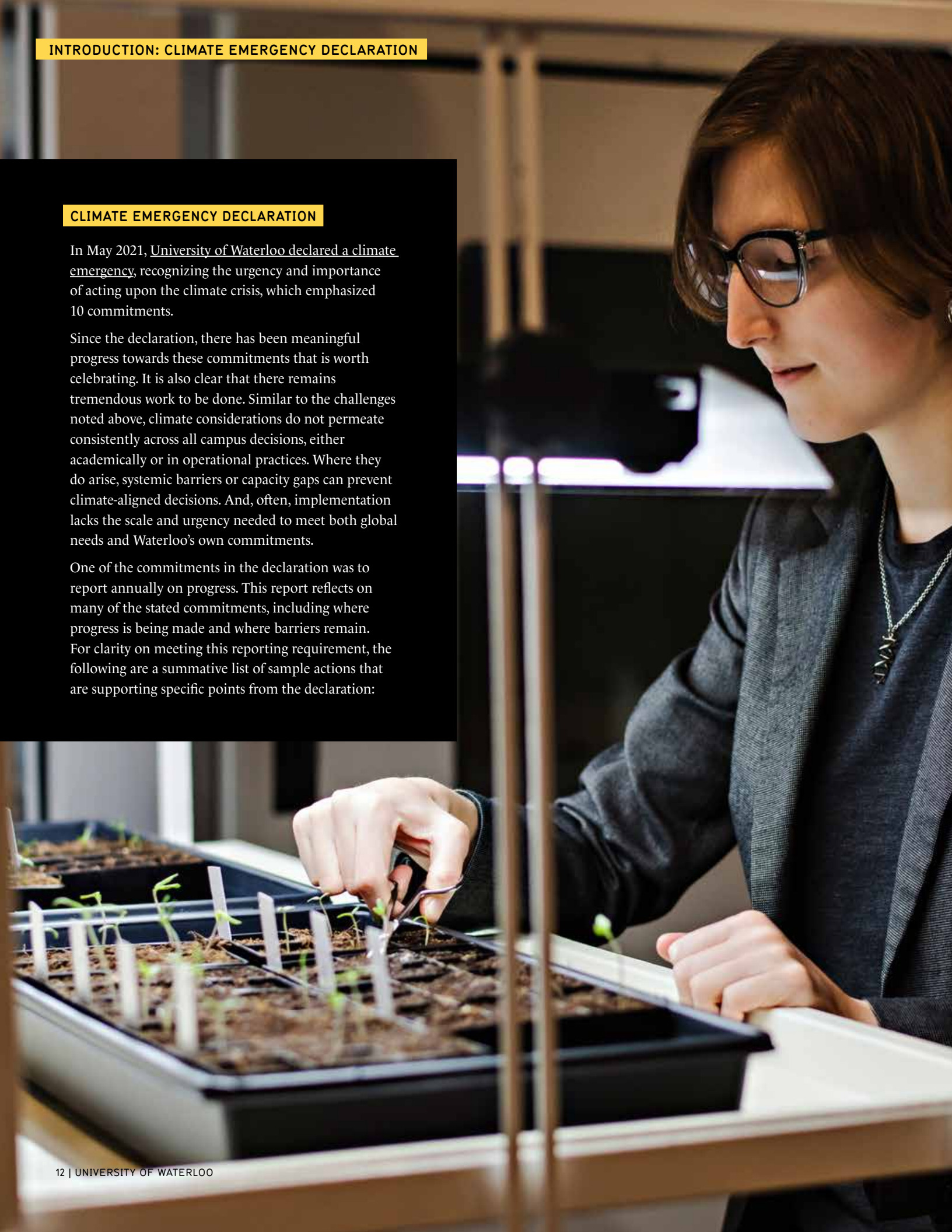
SUSTAINABILITY OBJECTIVE	STATUS
PROCUREMENT	
O13: By 2020, evaluate life cycle cost and require sustainability disclosure from suppliers for all purchasing decisions over $100,000.	Complete
O14: By 2018, establish baseline data and targets to improve the percent of campus-wide purchases that meet third-party standards for paper, electronic equipment, and cleaning supplies.	Mostly complete
COMMUNICATIONS	
E1: By 2020, Waterloo broadly distributes timely and audience-relevant information about sustainability initiatives and opportunities within the campus community.	Mostly complete
STUDENT ENGAGEMENT	
E2: By 2020, additional programming is developed for incoming students during orientation and in residences to encourage sustainable living on campus.	Mostly complete
E3: By 2018, establish a sustainability leaders program in partnership with students from residences, clubs and societies, student government, and for students in off-campus housing.	Complete
EMPLOYEE ENGAGEMENT	
E4: By 2025, increase from 5 per cent to 25 per cent the proportion of university departments that are Green Office certified.	Mostly complete
COMMUNITY ENGAGEMENT	
E5: By 2020, Waterloo is recognized as a sustainability leader in Waterloo Region.	Complete
GOVERNANCE AND BENCH-MARKING	
G1: By 2025, achieve and maintain a STARS Gold designation through the Association for the Advancement of Sustainability in Higher Education.	Somewhat complete

CLIMATE EMERGENCY DECLARATION

In May 2021, University of Waterloo declared a climate emergency, recognizing the urgency and importance of acting upon the climate crisis, which emphasized 10 commitments.

Since the declaration, there has been meaningful progress towards these commitments that is worth celebrating. It is also clear that there remains tremendous work to be done. Similar to the challenges noted above, climate considerations do not permeate consistently across all campus decisions, either academically or in operational practices. Where they do arise, systemic barriers or capacity gaps can prevent climate-aligned decisions. And, often, implementation lacks the scale and urgency needed to meet both global needs and Waterloo's own commitments.

One of the commitments in the declaration was to report annually on progress. This report reflects on many of the stated commitments, including where progress is being made and where barriers remain. For clarity on meeting this reporting requirement, the following are a summative list of sample actions that are supporting specific points from the declaration:



10 commitments from the climate emergency declaration

01 MOBILIZING AND ENABLING CLIMATE RESEARCH

› Launch of Waterloo Institute for Sustainable Aeronautics
› Success in Climate Action and Awareness funding
› 4 Waterloo Climate Institute/ Waterloo authors on IPCC sixth assessment report, the most of any Canadian university

02 ENGAGING IN MEANINGFUL PARTNERSHIPS AROUND SUSTAINABILITY AND CLIMATE

› Founding member of University Global Coalition, with 2021 work on global climate network mapping
› Host of Sustainable Development Solutions Network Canada
› Signatory to the UN Framework Convention on Climate Change Race to Zero

03 INTEGRATING SUSTAINABILITY AND CLIMATE IN THE CURRICULUM

› Launch of Climate and Environmental Change program
› Launch of Sustainability and Financial Management program
› Initiation of integration of sustainability within the curriculum project
› Launch of the Living Labs program

04 WORKING TOWARD CARBON NEUTRALITY IN OPERATIONS THROUGH THE SHIFT:NEUTRAL CLIMATE ACTION PLAN

› Preliminary investments in foundational projects
› Decrease of 8.6% in emissions from pandemic shutdowns and weather changes

05 ALIGNING INVESTMENTS WITH CLIMATE RISKS AND OPPORTUNITIES

› Signatory to UN Principles of Responsible Investment
› Development of ESG Policy for investment portfolios
› Commitment in 2021 to measure and reduce carbon intensity of investment portfolios, reaching carbon neutral by 2040

06 ENGAGING EMPLOYEES AND STUDENTS AS AGENTS OF CHANGE

› Launch of Green Labs program
› Continued support and growth of Green Residence and Green Office programs
› Hosting of campaigns and events to provide opportunities for involvement
› Redeveloping the Sustainability Certificate training program for employees
› Supporting the Living Planet @ Campus program in partnership with WWF Canada

07 DEMONSTRATING LEADERSHIP AND SPUR CHANGE WITHIN THE LOCAL COMMUNITY

› Pledging partner for waste and greenhouse gas (GHG) emissions of Sustainable Waterloo Region's Regional Sustainability Initiative
› Founding member of the Region of Waterloo's TravelWise program
› Steward of Energize community decarbonisation simulation and board game resources
› Membership on local advisory boards and committees

08 MAKING SUSTAINABILITY AND CLIMATE ACTION A STRATEGIC LENS FOR ALL UNIVERSITY DECISIONS

› Publication of new building design guidelines and lifecycle costing guidelines
› Integration of climate into Strategic Plan reporting framework

09 APPROACHING CLIMATE ACTION EFFORTS ALONGSIDE CONSIDERATIONS OF EQUITY, DIVERSITY, INCLUSION AND INDIGENIZATION

› Preliminary discussions and collaborations have taken place between the EDI-R, Indigenous Initiatives, Campus Wellness, Accessibility, Sustainability teams

10 REPORTING ANNUALLY ON PROGRESS, AND PROVIDE OPPORTUNITIES FOR COMMUNITY INPUT

› Inclusion in this annual report

ACADEMICS

Teaching and Learning

PROGRESS SNAPSHOT

OBJECTIVE A1: By 2019, ensure undergraduate students from any program of study will have the opportunity to learn about sustainability in their courses

Complete

INDICATORS:

496 Total courses focused on or related to sustainability

688 Total courses with likely connections to UN Sustainable Development Goals

14% Estimated percentage of students graduating from a program with a required sustainability course

OBJECTIVE A2: By 2025, identify and implement flexible strategies for 5 programs of study to more deeply integrate sustainability within the curriculum

Somewhat complete

INDICATORS:

4 New programs of study considering or integrating sustainability topics

OBJECTIVE A3: By 2025, every startup emerging from supporting programs at Waterloo will have access to tools and training to embed sustainability into their emerging business plans and models

Started

INDICATORS:

4 Resources and/or programs supporting integration of sustainability in entrepreneurship

Waterloo has longstanding leadership in environmental and sustainability education across Canada and around the world. The Faculty of Environment has continued to develop leading programming to engage sustainability innovators of the future, as have a variety of programs with collaborations across all six faculties.

As part of its annual reporting and triennial STARS submissions, Waterloo has reviewed academic calendars to identify courses related to key environmental sustainability topic areas. These included energy and climate change, sustainable food systems, land use change and biodiversity, waste and pollution, sustainable transportation, as well as directly on the topic of sustainability and its application.

These efforts have consistently identified nearly 500 courses (of ~5,300 total) across the undergraduate and graduate calendars. In 2021/22, Waterloo extended this assessment to consider all 17 UN Sustainable Development Goals. Almost all previous topics are reflected in the SDGs, though categorized in different ways, but they also integrate social and economic pillars of sustainability, including areas such as health, poverty reduction, decent work, gender and social inequalities, and peace and justice. Over 680 courses with likely connection to specific topics within the SDGs were identified. Hundreds more had potential connections, but there was insufficient information in course descriptions to fully determine these.

This is a promising foundation on which to build. A significant portion of the 500 environmental sustainability courses are within closely connected programs of study, such as Geography, Environment and Business, Environmental Engineering, Biology, and Environment, Resources, and Sustainability, and the majority of such courses are open to the entire campus community. The Sustainability Office calculated that only 14 per cent of students graduated from a program of study where one of these sustainability courses were part of the degree requirements. There are many potential avenues to better identify and measure this curriculum content, since this may not be capturing all activity. Some of this early reflection, however, indicates that a large portion – and likely a majority – of Waterloo students, may have limited exposure to sustainability curriculum.

CASE STUDIES

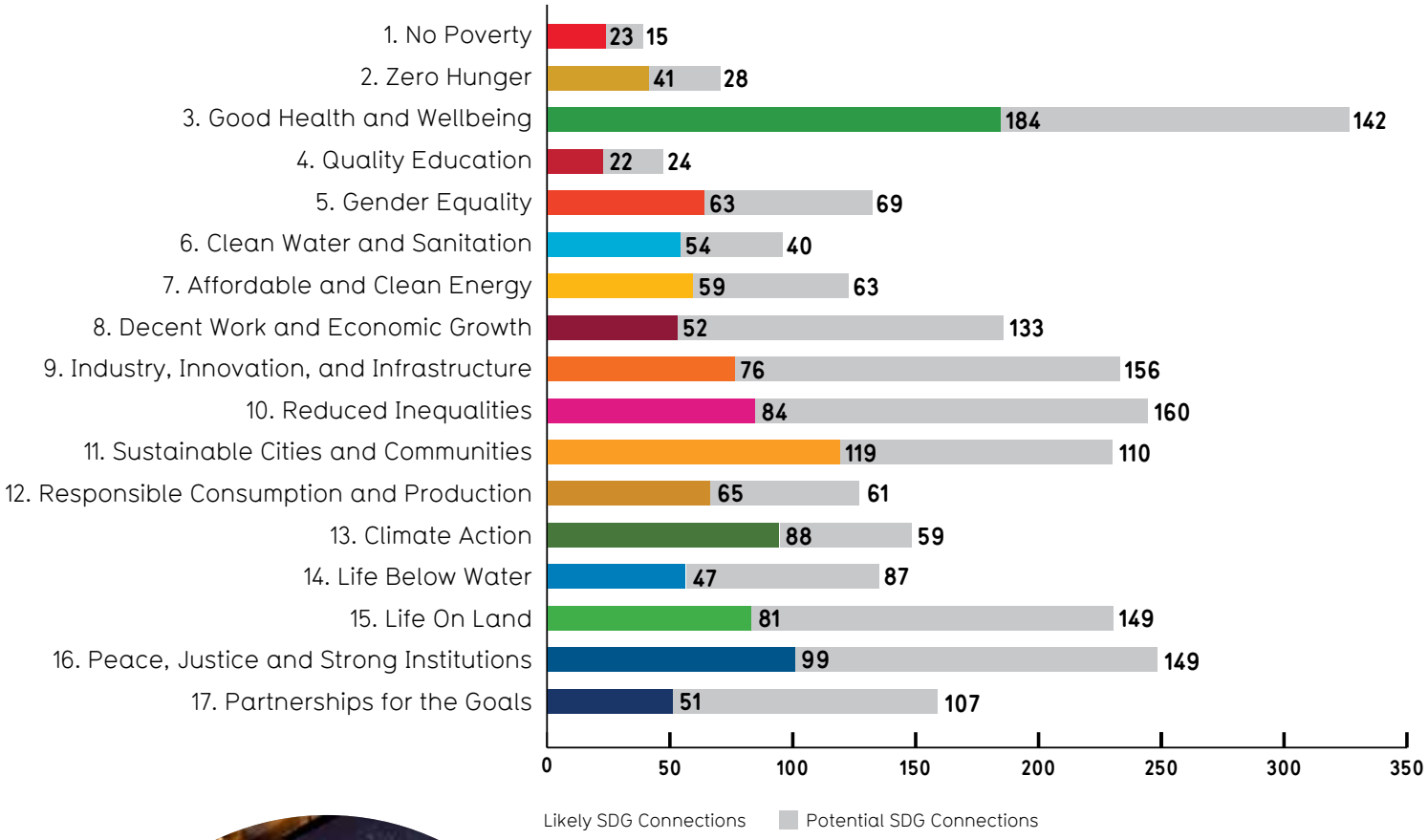
PREPARING TOMORROW'S CLIMATE CHANGE LEADERS, TODAY

As climate change continues to accelerate, critical talent is needed to help transition industry and society to a low-carbon economy and adapt to changes. The new Bachelor of Science in Climate and Environmental Change launched in Fall 2022 to prepare the next generation of climate leaders. Through a combination of biology, chemistry, physics, earth science, and human geography, graduates will hone solutions-oriented approaches to environmental challenges.

SUMMER SCHOOLING FOR CLIMATE AND WATER

In 2020 and 2021, the University of Waterloo's Water Institute and Waterloo Climate Institute engaged dozens of graduate students in a uniquely designed, three-week virtual water security summer school, "Climate Change and Water Security in Urbanized Watersheds: An Interdisciplinary Perspective". The summer school leveraged the wide-ranging expertise of the University's water and climate change researchers to teach participants about this increasingly complex topic.

Recognizing that topics such as climate change will have cross-cutting impacts across almost all industries and disciplines, it is important to identify relevant and appropriate mechanisms for students to understand how sustainability issues will impact the skills needed for future career success and competency within their respective fields of study. New programming such as the Sustainability Diploma can help to bridge this gap, with flexible options for students in any program of study. Additional conversations are beginning to map frameworks or various pathways for how various degree programs can integrate sustainability in discipline and program-relevant ways.



CASE STUDIES

BRINGING GLOBAL CHALLENGES TO THE CLASSROOM

The capstone Global Engagement Seminar brings together students from across the six faculties and the affiliated colleges to develop greater awareness of contemporary global issues, as well as to work collaboratively on creative solutions. Students work in small-group settings to build collaborative, interdisciplinary, and effective proposals for solving global problems. The program culminates in a high-profile Summit. This offers students the opportunity to showcase their projects and proposals, and topics over the past few years have included the future of nature (2020), the pandemic (2021), and water (2022).

QUICK FACTS

- Waterloo has Canada's oldest, largest, and most programmatically diverse dedicated Faculty of Environment, with a wide range of courses designed for a broad audience
- Interdisciplinary sustainability curricula include the Sustainability Diploma, which can be added to **any** undergraduate degree program, and the Collaborative Water Graduate Program, which is a suite of 22 interdisciplinary graduate programs
- In a campus-wide survey on development of the Environmental Sustainability Strategy, more than 80 per cent of students indicated they wanted to learn more about sustainability while at Waterloo, with a majority from all faculties

CASE STUDIES

EMBEDDING SUSTAINABILITY CHALLENGES IN ARTS FIRST

First year Arts students complete Arts First courses, ARTS 130 and ARTS 140, to meet the Undergraduate Communication Requirement. To create a unique first-year experience for students, Arts First courses foreground practice-based learning and background discipline-specific knowledge. These small classes create a supportive and engaging environment that allows for the building of a genuine community of learners. Recent topics on sustainability include "What a Waste!", "Denial & the Future of Climate Change", and "Solving the Climate Crisis".

ACCELERATING GREEN INNOVATION

In 2021, the Faculty of Environment hired the Green Innovation Program Developer to enhance student learning across the green innovation ecosystem and catalyze an external network of sustainable entrepreneurs. The position directly supports Concept by Velocity's WE Accelerate Innovation Stream as a climate-focused business coach, which has already assisted students to design a start-up focused on creative solutions for energy poverty and home energy efficiency. The position also manages the North American EcoInnovation Network in partnership with the Commission for Environmental Cooperation, a pan-national group of 20 stakeholders, nine Universities, and affiliated innovation hubs across Canada, the United States, and Mexico.

UNDERSTANDING THE MATH OF CLIMATE

Climate science is complex, and is rooted in mathematical and physical properties and models. A new course in Applied Mathematics, AMATH 362, will introduce students to how math is used to investigate and understand climate change. From solar radiation through climate feedbacks, the role of oceans, the Earth's rotation and the geometry of orbit, climate data and variability, and models of human-climate interaction, calculation and computation approaches will help students from a variety of disciplines have an introductory understanding of the mathematical description of the climate.

Research

PROGRESS SNAPSHOT

OBJECTIVE A4: By 2020, celebrate sustainability research as a core thematic strength of Waterloo's reputation and identity

Somewhat complete

INDICATORS:

15% Percent of central news releases and research-focused Waterloo stories highlighting scholarship related to environmental sustainability

OBJECTIVE A5: By 2025, become a world leader for research excellence in five sustainability related themes

Somewhat complete

INDICATORS:

361 Faculty members conducting research advancing the UN Sustainable Development Goals

37 Canada Research Chairs conducting research advancing the UN Sustainable Development Goals (out of 61)

OBJECTIVE A6: By 2025, establish Waterloo as a "go-to" hub for knowledge and expertise on sustainability challenges

Mostly complete

INDICATORS:

53rd Overall ranking in THE Impact Ranking globally

11th Overall ranking in THE Global Impact Ranking within Canada

81 Number of countries from which research collaborators jointly published with UW researchers on topics related to the UN SDGs

OBJECTIVE A7: By 2018, implement three new sustainability-related projects annually on campus using faculty and student expertise; by 2025, implement at least eight new projects annually

Complete '18

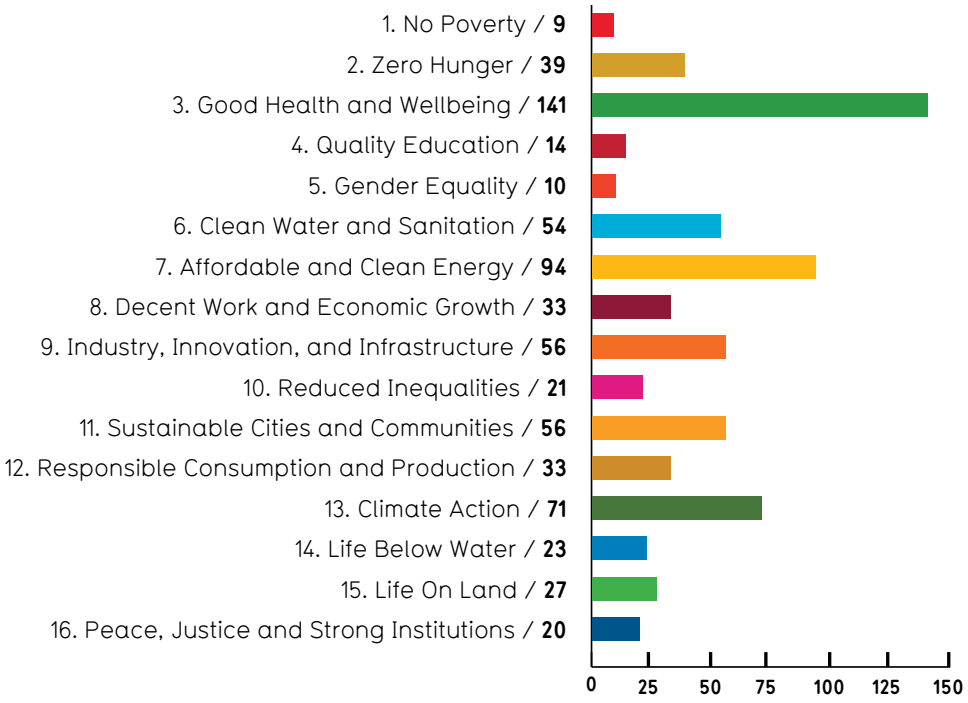
Somewhat complete '25

INDICATORS:

6 Living Lab projects completed or underway during 2021/22

Waterloo has developed numerous research strengths related to sustainability, with over 360 faculty members across the campus conducting research related to at least one of the UN SDGs.

Figure 2: Number of Researchers with SDG Publications (2016-20)



Over the past year, researchers have explored sustainability topics through both discovery and applied research approaches, including:

- *Food security challenges;*
- *Climate change impacts on public health delivery and maternal healthcare;*
- *Community climate adaptation;*
- *Climate risk and resilience in the insurance industry;*
- *Economic and political connections to climate policy and resource extraction issues;*
- *Effective tools to communicate and build support for social and scientific problems like climate change;*
- *Building sustainable energy technologies;*
- *Fabricating new materials with reduced environmental footprint and greater durability and circular design;*
- *Mathematical modelling of complex relationships between climate change and social conflict;*
- *Sustainably managing complex watersheds and aquatic ecosystems.*

This year, the Sustainability Office worked with the Library to better align its approach for measuring SDG-related research with emerging benchmarks and enable comparison across campuses over time. Previously, estimates of the extent and focus of environmental sustainability and SDG-related research were extracted from public faculty biographies on relevant department webpages. This year, Waterloo used the Elsevier data sets and keyword search strings to identify publications related to the SDGs with affiliation to Waterloo's faculty members. To be included, a researcher had to have at least three publications on any single SDG between 2016-2020. This has certain limitations, including multiple publications across different SDGs, research that is active but not yet published, and applied research that may have translated into a non-academic output. It is, however, an emerging standard and removes the subjective analysis required to interpret faculty biographies.

Key clusters of environmental strength include those connected to climate change, energy, water, and materials sciences, as well as sustainable cities. These closely align with many of Waterloo's research institutes on each topic.

There remains substantial potential for tremendous societal impact through Waterloo's research. There are continued efforts to more strongly collaborate among sustainability-related research institutes, to launch new sustainability research clusters such as the Waterloo Institute for Sustainable Aeronautics, and to mobilize seed funding for certain topic areas.

CASE STUDIES

SEEDING INNOVATIVE WATER RESEARCH

The Water Institute has taken steps over the past year to mobilize seed funding to spur water-related innovative research. This includes launching another round of its Seed Grants, which have been active since 2014, inaugural WI/WIN seed grants to stimulate interdisciplinary collaboration, as well as a new Water Innovation Challenge in partnership with BlackBerry. All three initiatives will support cutting-edge research on new ways to sustainably manage vital water resources.

QUICK FACTS

› Waterloo has six University research institutes with significant sustainability focuses or research streams:

1. Waterloo Climate Institute
2. Waterloo Institute for Sustainable Energy
3. Water Institute
4. Waterloo Institute for Sustainable Aeronautics
5. Waterloo Institute for Nanotechnology
6. Waterloo Centre for Automotive Research

› Four researchers from Waterloo Climate Institute were lead or contributing authors on the Intergovernmental Panel on Climate Change's Sixth Assessment work, the most of any Canadian university

› Researchers from all six faculties participate in and contribute to interdisciplinary efforts to understand sustainability challenges and develop innovative solutions

CASE STUDIES

CATALYZING CLIMATE ACTION AND AWARENESS

Several researchers from Waterloo's Faculty of Environment received funding through Environment and Climate Change Canada's Climate Action and Awareness Fund. In total, six major projects were approved for funding of $15.5M, representing over one-quarter of the projects funded across Canada. Topics include measuring and monitoring city-level GHG emissions, measuring the climate benefits of peatlands and lowlands, assessing the climate impacts of residential developments, and research to support policies and decision-making for direct air capture technology in Canada.

TAKING OFF ON SUSTAINABLE AERONAUTICS

In 2021, the University launched the Waterloo Institute for Sustainable Aeronautics (WISA) as the world's leading hub for sustainable aviation and aerospace research, technology, and education. The centre is led by the Faculty of Environment and has participation from all six faculties in cutting-edge research to tackle a growing and difficult-to-decarbonize sector of the global economy. The Institute is also working on development of a related collaborative graduate program.

BUILDING COLLABORATIONS FOR SUSTAINABLE NANOTECH

The Waterloo Institute for Nanotechnology (WIN) seamlessly merges its research activities with the UN SDGs. In 2020/21, through its Interdisciplinary Research Funding program, it tackled key challenges related to climate change, reduction of global waste, and biodiversity loss. In parallel, it organized the International Workshop on Nanotechnology for a Sustainable Future in November 2020, with the Netherlands as the partner country. It catalyzed the launch of the International Network for Sustainable Nanotechnology (N4SNano) with UCLA, MESA+, and Sydney Nano as founding partners and JST, Japan as a supporting member.

LIVING LAB SNAPSHOT

With a campus and community that is the size of a small city, Waterloo's own sustainability transformations present an incredible teaching and research tool. How can the campus leverage its ongoing shift to decarbonize and to embed circular and regenerative practices into a learning tool across disciplines? How can Waterloo leverage the considerable knowledge across its students and faculty to support these transitions?

The Sustainability Living Lab (SLL) was launched in late 2021 to link academic expertise and capacity with these operational needs. Building on a long history of using the campus as a living lab back to the early 1990s, the new iteration will more tightly link operational sustainability initiatives to the University's academic mission.

Early projects facilitated through the SLL in late 2021/early 2022 include:

› A SEED masters group project exploring various engagement and communication opportunities for the Sustainability Office

› Two Planning project teams that conducted geospatial analysis and best practice research on employee transportation patterns to feed into a Transportation Demand Management plan

› A Knowledge Integration class project to design a public service announcement for sustainable food systems on campus and waste management

› An Engineering capstone project looking at net zero plans for the UWP Courts

› EDGE student projects looking at zero-emissions landscaping equipment and naturalized landscaping communications

VALUING WATERSHEDS

Researchers from Waterloo are leading the Valuing Canada's Water Resources and Aquatic Ecosystem Services program, the largest coordinated water valuation research program in Canada. It aims to develop, test, and apply reliable and robust state-of-the-art valuation methods and techniques for aquatic ecosystem services in different water policy contexts across the Canadian landscape. The program will advance understanding of the value of water in Canada by developing best practice guidelines, providing new empirical evidence, and advancing new policy-relevant decision-support tools.

TRACING THE PATTERNS OF LIFE ON A CHANGING PLANET

Researchers from the Faculty of Math are among a prominent global collaborative team utilizing DNA barcoding to support biodiversity science and understand the complex web of life on earth. The project will contribute to mitigating the ongoing biodiversity crisis and mass extinction by completing detailed inventories of all species, their interactions, and global bio-surveillance under changing ecosystems.

CONTROLLING INVASIVE SPECIES

Researchers from Biology are working with the Town of Saugeen Shores to help manage invasive species through the Fairy Lake ecology project. Common Carp and Curly-leaf Pondweed are choking out other species in the lake ecosystem. The research team will conduct a biological assessment of the lake and explore remedial actions to control the invasive species.

DECARBONIZING GLOBAL STEEL

Globally, steel production is a large source of greenhouse gas emissions, and is notoriously difficult to decarbonize. A new collaboration between researchers from the University of Waterloo and Strathclyde University in Scotland is aiming to tackle this by exploring the role hydrogen can play in decarbonizing the steel industry.

OPERATIONS

Climate Change and Energy

PROGRESS SNAPSHOT

OBJECTIVE 01: By 2019, develop a long-term Climate and Energy Action Plan to achieve carbon neutrality by 2050, with interim milestones for 2025 and 2035; achieve a 17.5 per cent reduction in GHG emissions by 2025 from a 2015 baseline

Complete '19

Somewhat complete '25

INDICATORS:

COMPLETE	Development of *Shift*:Neutral Climate Action Plan
7/46	Actions from *Shift*: Neutral completed
-8.6%	Change in emissions from 2015 (Scope 1 & 2)
36,637	Tonnes of GHG emissions (Scope 1 and 2)
37,341	Tonnes of GHG emissions (Scope 1, 2, and select Scope 3)

OBJECTIVE 02: Implement cost-effective and practical strategies to reduce or minimize growth in energy use on campus

Started

INDICATORS:

388	(NekWh/m^2) Weather-normalized energy intensity*
-6.4%	Change in energy intensity from 2015

*Energy intensities are presented in raw/unadjusted terms through 2010-14, and since then normalized to 2015 heating degree days

Supporting UN SDGs:

Waterloo's Scope 1 and 2 (direct and electricity) emissions have decreased by approximately 8.6 per cent since 2015, as shown in Figure 3, reflecting progress of approximately 50% toward the 2025 target. This is assumed to be due to significant decreases in campus occupancy throughout the pandemic, which was experienced in 2020 and much of 2021. 2020 and 2021 also saw milder winter seasons compared to the average, reducing heating needs. Corrections to Waterloo's gas billing throughout 2020, which had previously relied on estimates from utility providers during that year, show a measurable and material reduction based on actual readings.

Some increases in energy consumption and related emissions are expected as Waterloo increases occupancy and a resumes greater range of activities throughout 2022. However, the continued drop in emissions in 2021, despite some occupancy increases, is encouraging. Plant Operations also began repairs to several steam traps throughout 2021, which may have contributed to the sustained decrease.

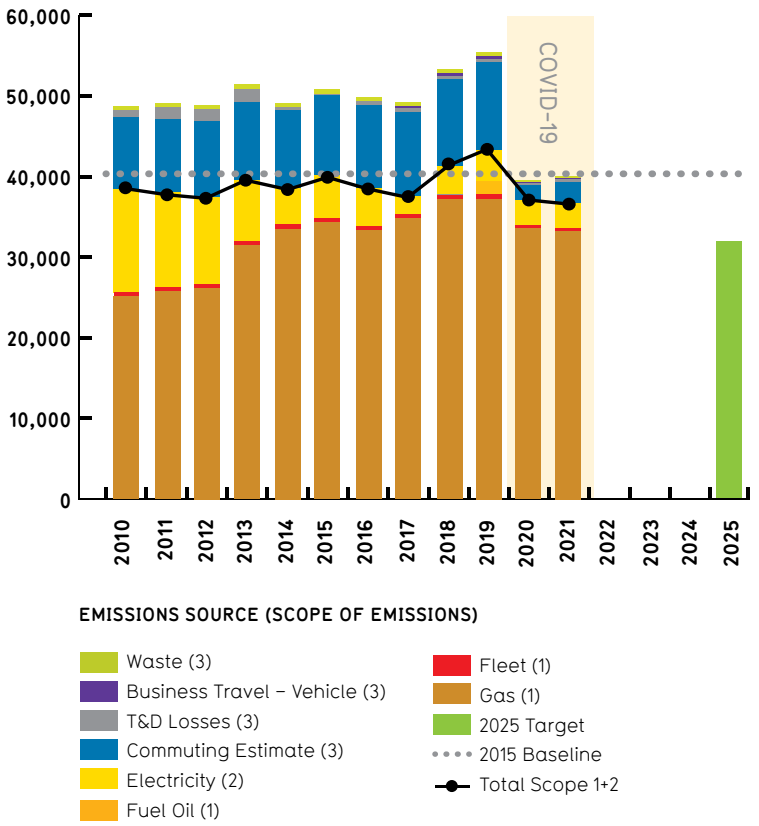
In late 2021, budget approval was confirmed for several foundational projects, illustrated below. Waterloo also sought external funding for more ambitious deep energy retrofit projects and will continue to do so going forward. However, it is imperative to scale investment in energy and carbon reduction projects to meet both 2025 and longer-term goals, and to align these investments with campus capital planning and renewal needs.

Waterloo is moving too slowly on emissions reductions to reach the 2025 target. The necessary level of resources and capacity have not been mobilized.

QUICK FACTS

- 8.6 per cent decrease in emissions compared to 2015 base year reflects progress of approximately 50% toward the 2025 target
- >90 per cent of Scope 1+2 emissions are from gas for heating space and water, although electricity emissions are climbing due to provincial shifts toward more gas-fired generation
- $1.2M in energy projects and foundational support were committed in 2021/22
- Air travel and commuting were estimated for 2018 and 2019 but are absent for 2020 and 2021. Tracking will resume in 2022 based on more representative activity levels
- Historical emission factors were updated for both electricity and gas
- Waterloo's new building guidelines prioritize deep energy efficiency and net-zero ready design

Figure 3: Total Emissions (t CO_2-e)



To ensure accountability, transparency, and holism of carbon accounting, the Greenhouse Gas Protocol defines emissions as follows:

Scope 1 – Emissions directly from the university

Scope 2 – Indirect emissions from energy

Scope 3 – Indirect emissions from upstream or downstream supply chain or services

Scope 3 can include many sources of emissions. Other material emissions sources which are not presently quantified but are being explored further include:

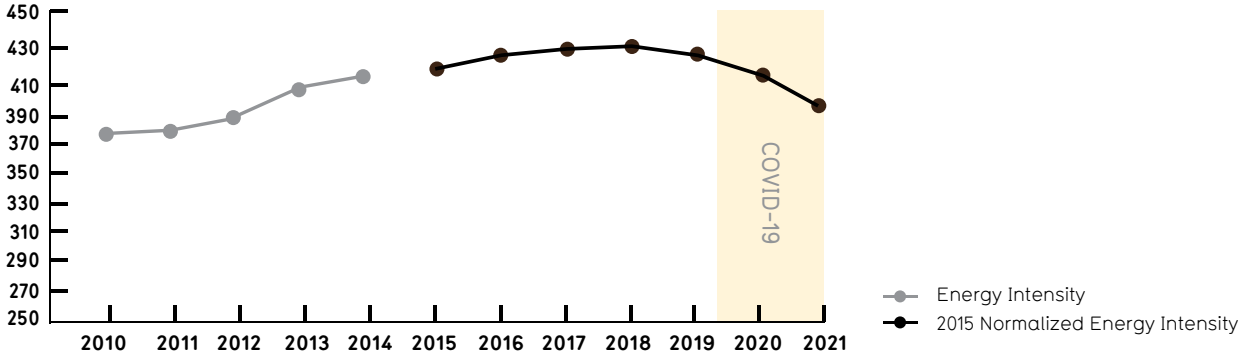
› Emissions from air travel for University activities

› Emissions from the supply chain for food purchased and sold on campus

› Emissions from the supply chain for products and commodities used and sold on campus (paper, IT, furniture, etc.)

› Emissions that are embodied in construction materials (steel, concrete, glass, etc.)

Figure 4: Energy Intensity (Normalized ekWh/m²)*



*Energy intensities are presented in raw/unadjusted terms through 2010–14, and since then normalized to 2015 heating degree days

CASE STUDIES

ENABLING BETTER BUILDING DATA

With a large and diversified portfolio of buildings, information about building-level energy consumption is critical for benchmarking, performance management, user engagement, and project design. In 2021, Plant Operations initiated a front-end system as a backbone to collect building-specific utility metering. A pilot project is connecting a subset of buildings to the front-end system throughout 2022 to provide historical and real-time energy consumption information.

STUDYING DISTRICT ENERGY OPPORTUNITIES

In 2020 and 2021, Waterloo completed an energy audit of all buildings on campus. This is being complemented with an assessment of options for decarbonisation of Waterloo's district energy system, which supplies about 75 per cent of Waterloo's total energy to buildings within and around Ring Road. The study will explore technologies, conceptual arrangements, and phasing of options to replace gas-consuming steam boilers over the long-term.

REPAIRING STEAM TRAPS

Steam traps help capture condensate throughout Waterloo's district heating system and recirculate the condensate without leaking steam. Many of these are not functioning properly across the campus, and in 2021, Plant Operations began retrofitting some of the failed traps to improve district system efficiency. The project will continue over 2022/2023.

MAKING A SHIFT TO LAPTOPS

Throughout the pandemic, many departments across campus began shifting away from desktop purchases and toward laptops. In addition to the portability and flexibility benefits of laptops, there can be substantial associated energy savings, since laptops often use less energy, can run off battery during peak energy demand times, and eliminate the need to run multiple computers simultaneously to enable remote desktop access. This transition has been fully embraced within IST and is well underway across many faculty computing offices and academic support units.

Waste

Supporting UN SDGs:

PROGRESS SNAPSHOT

OBJECTIVE 03: By 2025, achieve a 60 per cent diversion rate; by 2035, become a zero-waste campus (90 per cent diversion rate)

Started

INDICATORS:

35.8%
Waste diverted from landfill

1,701
Tonnes of waste sent to landfill

Waterloo currently diverts 35.8 per cent of its generated waste from landfill. Through multiple waste reduction, recycling, and reuse programs, Waterloo has a large variety of options for reducing and managing waste from regular operations, which has led to gradual diversion rate increases over time prior to the pandemic. The significant increase in 2021 brings the diversion rate ahead of pre-pandemic levels as programs and services resumed activity.

This is an encouraging trajectory, and major effort will now need to be placed on optimizing and fully utilizing existing programs. For example, Plant Operations' Custodial team has invested significantly in standardizing user-friendly and more informative waste receptacles. These are driving an impact, but there are still higher than expected levels of contamination of recycling and organics streams due to poor sorting. The vast majority of waste sent to landfill could be diverted through an existing recycling or organics program. While educational efforts can and will accelerate, it is critical to also target more directly the root causes of waste, such as through procurement efforts and offering more simply designed products that are easily recyclable, or ideally reusable, across campus services and activities.

Waterloo will also need to address growing regulatory risks and requirements related to waste management, including expanding producer responsibilities for self-branded and generated materials, pending requirements for phase-outs of single-use items, and requirements to meet organics capture and diversion targets.

QUICK FACTS

- +6.4 per cent increase to the diversion rate in 2021; if replicated year-over-year, Waterloo would reach its 2025 target
- >25 formal waste diversion streams or programs are active across campus
- 70–80 per cent of what is discarded in garbage could be recycled, according to waste audits

Figure 5: Diversion Rate (%) and Landfill Weight (t)

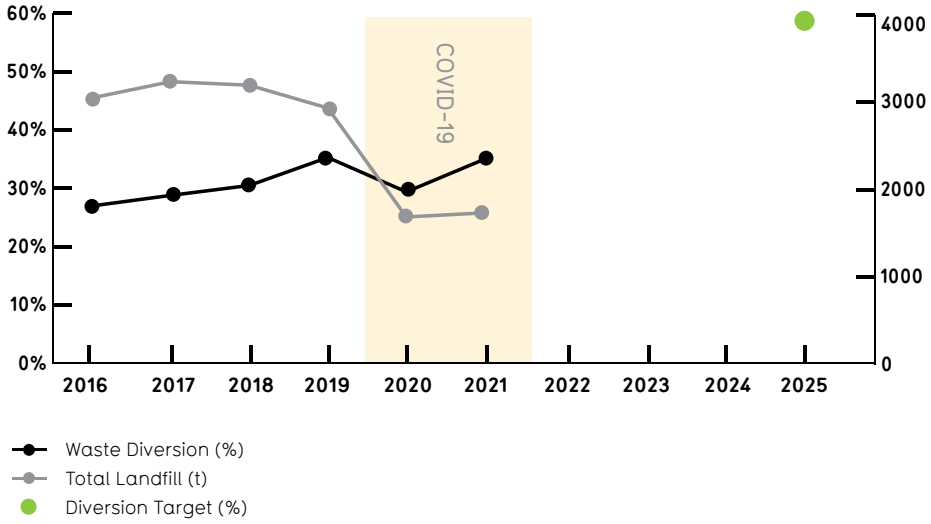
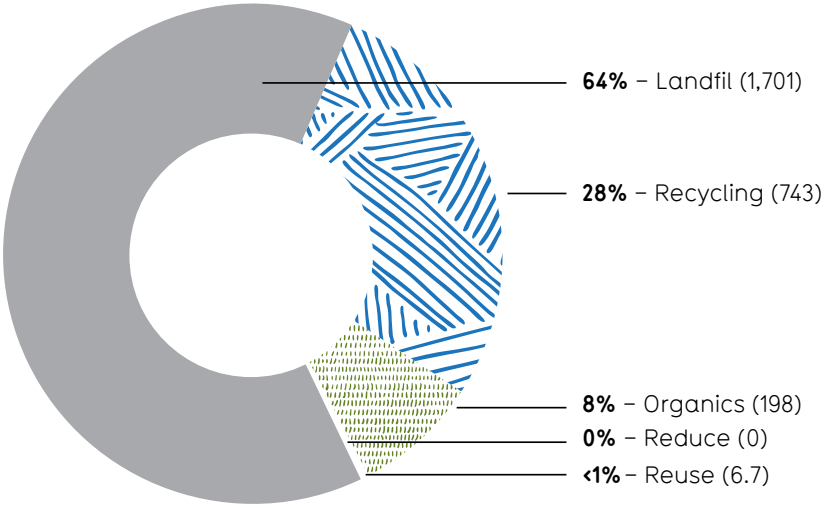


Figure 6: 2021 Waste Composition (tonnes in brackets)



CASE STUDIES

CAPTURING PPE WASTE

In late 2021, Environmental Services launched the first Personal Protective Equipment (PPE) recycling program, initiating drop-off boxes for masks, gloves, gowns and more across some of Waterloo's clinical services areas. The pilot is intended to expand to more areas of the campus over the coming years.

SORTING AT YOUR FINGERTIPS

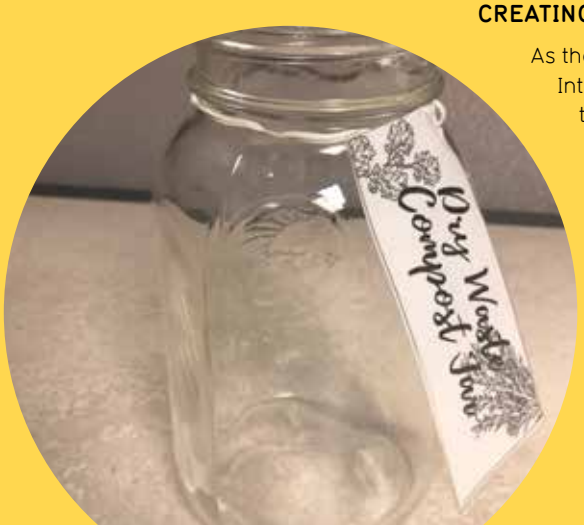
Ever wondered whether a certain item can be composted or recycled? Now there is an app for that! Visit the Shift Zero waste sorting app on the Android and Apple stores, or visit the web version, to search for various items and the app will identify the proper disposal instructions. Making sure items are sorted into the correct stream is critical to make recycling and composting possible. Plus, the in-app game will test your sorting smarts to see if you can correctly identify how to dispose of common items.

CLOSING THE LOOP ON CLOTHING

WUSA launched the Thrift Store in early 2022, creating a new space for students to buy and return gently used clothing. The store will help manage the large amounts of clothing that are often left behind from move-outs, while providing incoming and existing students with access to affordable clothing options. Check out the store in the basement of the SLC.

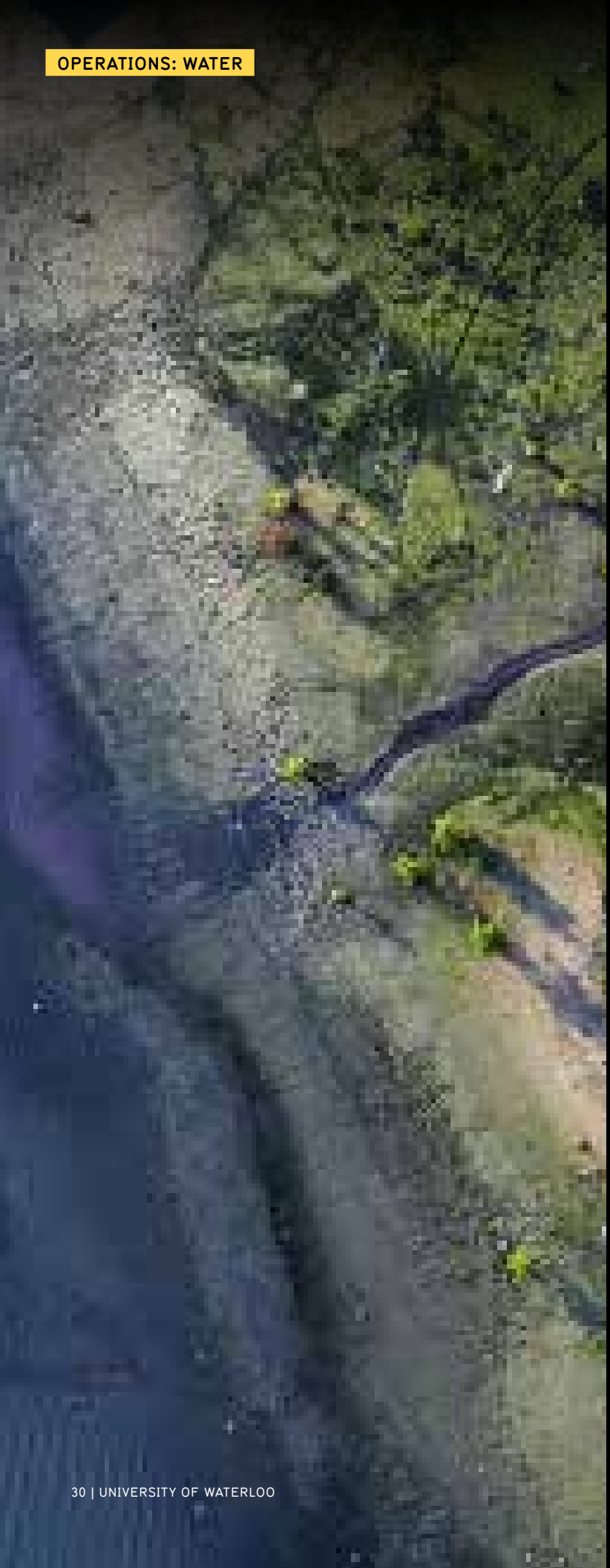
RECOVERING MOVE-OUT WASTE

Students often leave behind many items in good condition when they move out of Residences. Resuming momentum from before the pandemic, Campus Housing launched a wildly successful program in April 2022 to recover a large portion of these materials that would otherwise go to landfill. Collection included clothing, electronics, household items, non-perishable food, and books, totalling over 13,500 lbs. This will continue in the years to come!



CREATING A ZERO WASTE OFFICE

As the team returned to on-campus work, the Work Integrated Learning Programs office reinstated their zero-waste office practices, which use compost jars at each desk in place of garbage cans. Their newsletter has continued to play a key role in highlighting important topics such as the impact of waste reduction and will begin to be shared more broadly in Spring 2022, reaching over 300 employees.



Water

Supporting UN SDGs:

PROGRESS SNAPSHOT

OBJECTIVE 04: By 2025, reduce water intensity by 5 per cent per square metre from a 2015 baseline

Complete (tentative)

INDICATORS:

33% Reduction in water use intensity since 2015

0.55 Metres cubed water use per square metre

OBJECTIVE 05: By 2025, expand the deployment of stormwater management technologies to targeted areas

Mostly complete

INDICATORS:

4 New stormwater management features on campus

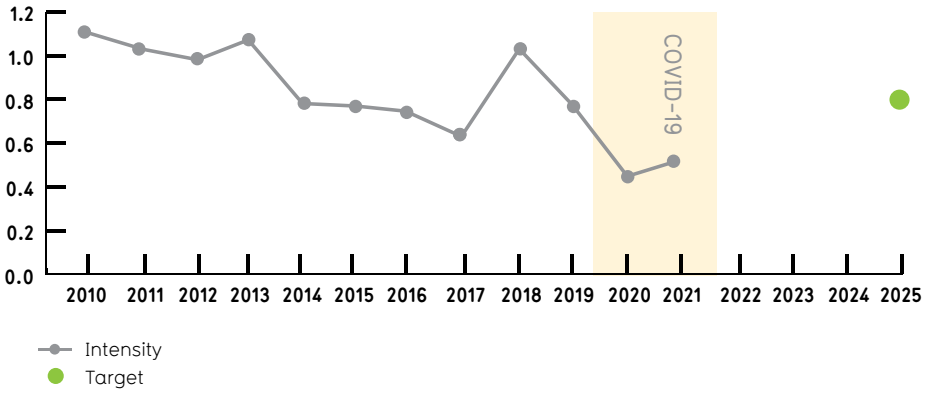
15 Stormwater features implemented on campus

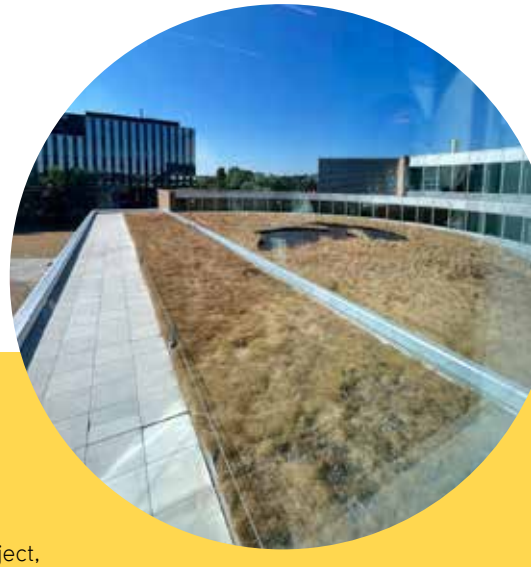
The University's water footprint continued to be much lower than before COVID-19, in both absolute terms and in terms of intensity. The campus has exceeded its target by a wide margin, although some consumption is likely to increase throughout 2022 and 2023 with increased occupancy. New projects underway will likely make it possible for Waterloo to continue to maintain its target going forward.

QUICK FACTS

- 5 green roofs and/or rooftop gardens
- 3 permeable pavement installation sites
- 5 stormwater ponds and 1 rainwater cistern
- >1,500 showerheads and >3,500 faucets scheduled for replacement with low-flow fixtures

Figure 7: Water Intensity (m^3 per m^2 of space)





CASE STUDIES

TURNING DOWN THE TAP

In early 2022, Waterloo initiated a project to install faucet aerators on most sinks across campus and retrofit showerheads in Campus Housing to lower-flow fixtures. These will reduce water consumption for most sinks and showers by 30-40 per cent, saving water and energy to heat water.

GREENING THE VIEW AT THE SLC EXPANSION

As part of the SLC-PAC expansion project, completed in 2021, a green roof was added above the food court. The roof provides a space for wildflowers and grasses that ca be habitats for pollinators, helps absorb rainwater to limit runoff, and provides a greener view from the newly redesigned adjacent study and workspaces.

Transportation

Supporting UN SDGs:

PROGRESS SNAPSHOT

OBJECTIVE 06: By 2025, increase to 90 per cent the proportion of sustainable commuting trips from a 2016 baseline of 85 per cent

Complete (tentative)

INDICATORS:

93% Combined student and employee trips* to campus using a sustainable mode

98% Student trips* by walking, cycling, carpooling, transit, or online learning

90% Employee commuting trips* by walking, cycling, carpooling, transit, or telework

OBJECTIVE 07: By 2020, increase electric and alternative-fuel vehicle use on campus

Complete (tentative)

INDICATORS:

2.5% Of vehicles used to commute to campus are electric or plug-in hybrid electric

OBJECTIVE 08: By 2025, reduce fossil fuel consumption across the campus fleet by 25 per cent from a 2015 baseline

Complete (tentative)

INDICATORS:

29% Reduction in fleet fuel use since 2015

154,726 Litres fuel consumption

*Significant upward shifts expected post-pandemic

Transportation is relevant to the University of Waterloo in 3 distinct ways:

1. *Commute: students and employees commute to and from the campus*
2. *Travel: campus community members travel for research, conferences, exchanges, and other University business*
3. *Fleet: Waterloo's owns and operates a fleet of over 130 vehicles*

These contribute to Waterloo's carbon footprint, with commuting and business travel each estimated to generate over 10,000 t CO2-e annually, as well as shaping both campus and community spaces and social fabric.

Through the pandemic, travel restrictions and remote work/learning environments reduced all three dimensions, far exceeding established targets for commuting and fleet. As shown below for sustainable commuting, the major increase observed in 2020 was due to remote working and learning. It is expected that commuting and business travel emissions will rebound without further action and support, though digital transformations have opened new possibilities that were not thought possible only a few years ago. Waterloo will update its commuting data in Fall 2022 and is working to improve the data collection accuracy for business travel impacts as well as develop recommendations for strategies to reduce emissions from business travel.

Waterloo's fleet has been underutilized for the past two years, with decreases in fuel consumption in 2021 exceeding Waterloo's target. This is expected to rebound slightly, though new efforts to encourage electric vehicle (EV) adoption can help to maintain more of the current progress, as well as insulate against rising fuel prices.

QUICK FACTS

- Waterloo has 18 EV charging stations, with 15 added in 2021/22
- Discounted transit passes are available for all students and employees
- Emergency ride home program is available for employees using sustainable transportation
- Carpool/bikepool software is available through the TravelWise program
- 3 new electric light-duty fleet vehicles were added in 2022, with significant growth potential

Figure 8: Sustainable Trips to Campus (% of Total)*

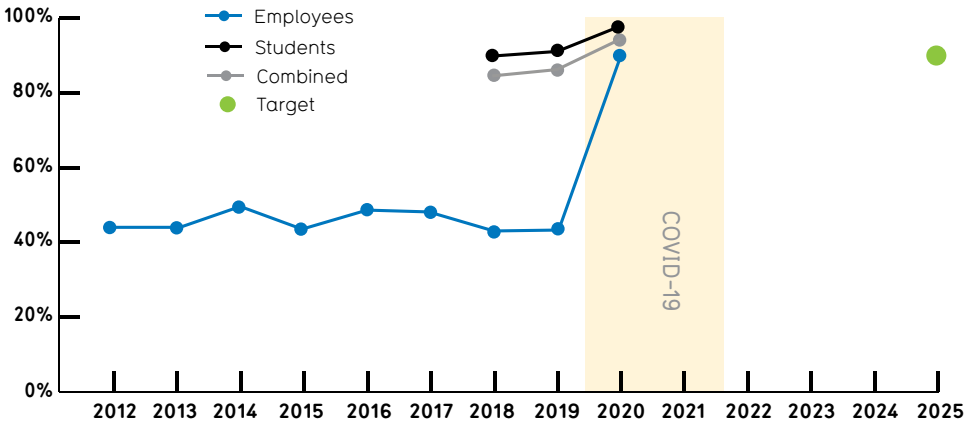
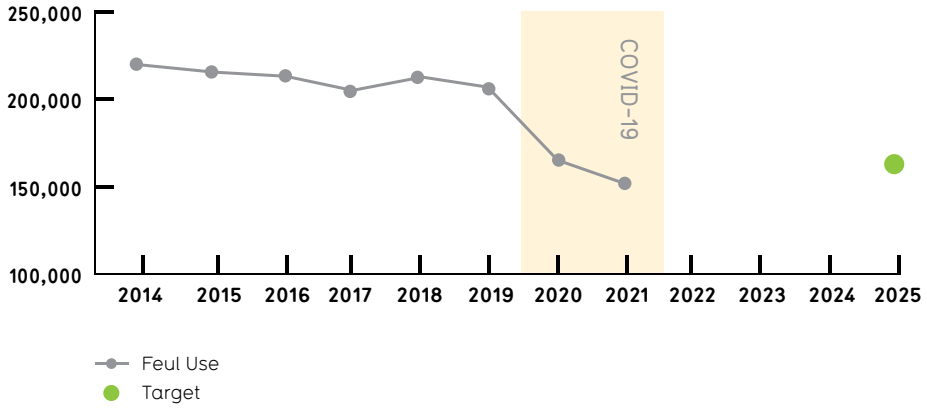


Figure 9: Fleet Fuel Use (L)



*"Trips" is used generically to refer to how students and employees move to a place of work or study from their place of residence. This includes, for example, trips from students living in residences as they travel to academic buildings, as well as "avoided trips" from remote learning or work-from-home activity.

CASE STUDIES

CHARGING THE FUTURE

Waterloo completed in 2021/22 a major expansion of its electric vehicle charging infrastructure, adding 15 new Level 2 stations across campus for commuters and fleet vehicles. The stations require a valid Waterloo parking permit and utilize the FLO network. The project was made possible thanks to funding from the NRCAN Zero Emissions Vehicle Infrastructure Program.

IDENTIFYING ELECTRIC POTENTIAL

In 2021/22, a joint project between the Sustainability Office and Plant Operations piloted telematics sensors on 15 fleet vehicles to determine their suitability to be replaced with an electric model over time. 100 per cent of the vehicles proved to be functionally suitable for electrification with a currently available EV model, with many of them financially beneficial or breakeven to the owning department when considering incentives.

INCENTIVIZING ZERO EMISSIONS VEHICLES

In early 2022, Waterloo launched a new internal subsidy for purchasing EVs within the campus fleet. Any department seeking to replace an existing vehicle with an electric model can qualify for up to $10,000 to offset initial purchase price increases, while recovering costs in the long run. To date, the incentive has supported three light-duty electric vehicles in the Grounds maintenance division.

Grounds

Supporting UN SDGs:

PROGRESS SNAPSHOT

OBJECTIVE 09: By 2025, all University grounds will be maintained according to sustainable landscaping standards, and plans developed for remediation and preservation of specific natural areas of concern

Mostly complete

INDICATORS:

TBC Per cent compliance with sustainable landscaping standard forthcoming

100% Grounds managed to integrated pest management principles

Waterloo manages over 1,200 acres of property, with a mix of natural areas, semi-natural areas, farmland, and managed turf/lawns. Under the leadership of the Grounds Services team, Waterloo has had longstanding practices to utilize integrated pest management principles since the late 1990s, which restrict usage of pesticides and fertilizers in blanket applications, and target/escalate usage only when necessary for safety or environmental reasons (i.e. sports fields or invasive species).

Throughout 2021 and 2022, Waterloo has made substantial planning progress in several areas. It has developed a Salt Reduction Workplan and drafted a unified standard for stewardship and care of its lands, linking many of the historical achievements and practices together, as well as defining proposed continuous improvement measures.

QUICK FACTS

- Waterloo has >1,200 acres of managed grounds and a 270 acre Environmental Reserve
- Integrated pest management principles for reduced pesticides/fertilizers have been applied since the 1990s

CASE STUDIES

STANDARDIZING LAND CARE

Waterloo's land care practices have evolved flexibly over time, responding to stakeholder feedback and changing regulatory demands, but they lack an organizing standard and framework. Throughout 2021 and 2022, the Sustainability Office and Grounds Services completed an initial draft of a unified standard that, while being a living document, would more transparently and holistically guide decision-making and operational practice. It includes categories such as soil and vegetation management, fertilizers and pesticides, biodiversity, water management, snow and ice management, equipment, and communication and engagement. Stakeholder and community consultations and approvals will take place throughout 2022.

GROWING THE CAMPUS ECOMAP

Aligned with the emerging land care standard, a student and instructor team worked to develop an initial platform and categorization framework for developing species inventories across campus throughout 2021. The new Campus Ecomap is a Sustainability Living Lab resource that will enable a wide range of data sets about species identification and geographical area identification to be consolidated into a more central database. This will help monitor campus biodiversity for plant and wildlife over time.

REDUCING SALT APPLICATION

Over the past year, Waterloo has worked with the Region of Waterloo to develop a salt reduction workplan as a new requirement under the Clean Water Act and local Sourcewater Protection Plan, for parts of the campus nearest to water wells. This will require increased monitoring, shifted practices, and continuous management to both reduce salt application and minimize its absorption within the watershed. As an early initiative, Grounds will be piloting a brining machine to reduce salt pellet application on walkways, with funding from the Sustainability Action Fund.

Food

Supporting UN SDGs:

PROGRESS SNAPSHOT

OBJECTIVE 010: By 2025, 40 per cent of all Food Services food and beverage purchases are produced on-site, locally, or are third-party certified for sustainability

Mostly complete

INDICATORS:

25% Of all food and beverage purchases are local, produced on-site, or third-party certified for sustainability

OBJECTIVE 011: By 2018, achieve and maintain a Fair Trade Campus designation

Complete

INDICATORS:

COMPLETE Fair Trade Campus designation received May 2019

OBJECTIVE 012: By 2020, deliver multifaceted programming to grow student and employee awareness about healthy and sustainable food choices

Complete

INDICATORS:

19 Projects or initiatives to increase food health and sustainability awareness

Many food and dining locations across campus remained closed or had limited availability throughout 2021 due to pandemic restrictions. Nonetheless, Food Services continued to support integration of local food into menus across the University, as well as source sustainably certified seafood, coffee, tea, and chocolate. A decrease in overall percentage of local and sustainably sourced food was driven by pandemic changes and is likely to reverse going forward.

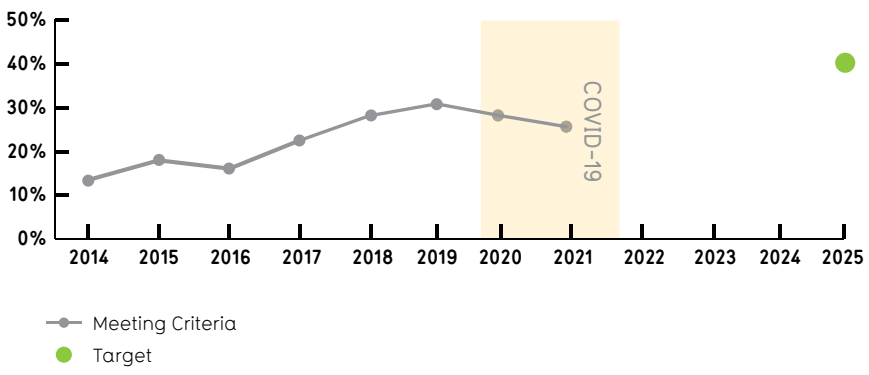
Food Services has also continued to expand plant-based options across the campus, with almost half of all meals served in residences typically being vegan or vegetarian. Tracking has been put in place to help measure plant-based options, and approximately 30 per cent of all food sourcing in 2021 was plant-based, by dollar value.

Even though the pandemic limited connections, Food Services continued to build education around sustainable food, launching in March 2022 a plant-based tasting challenge for over 150 students, titled "I can't believe it's a plant-based entrée!"

QUICK FACTS

- Waterloo has been designated as a Fair Trade Campus, ensuring that all University and student-run food outlets provide fair trade coffee, tea, and chocolate. Fair trade supports better wages for farmers, investments in farming communities, and environmental protection
- Food Services hosts Farm Markets during harvest season, to connect students and employees with fresh local produce
- The Farm to Campus Fresh program highlights locally sourced options across campus menus
- Vegan and vegetarian options are available across all residence dining halls

Figure 10: Food Purchases Meeting Target Criteria (% of Total)



Procurement

Supporting UN SDGs:

PROGRESS SNAPSHOT

OBJECTIVE 013: By 2020, evaluate life cycle cost and require sustainability disclosure from suppliers for all purchasing decisions over $100,000

Complete

INDICATORS:

COMPLETE
Development of guidelines is underway

16 Major suppliers participated in pilot sustainability disclosure process

OBJECTIVE 014: By 2018, establish baseline data and targets to improve the percent of campus-wide purchases that meet third-party standards for paper, electronic equipment, and cleaning supplies

Mostly complete

INDICATORS:

93.5% Of all paper purchases have FSC certification and/or recycled content

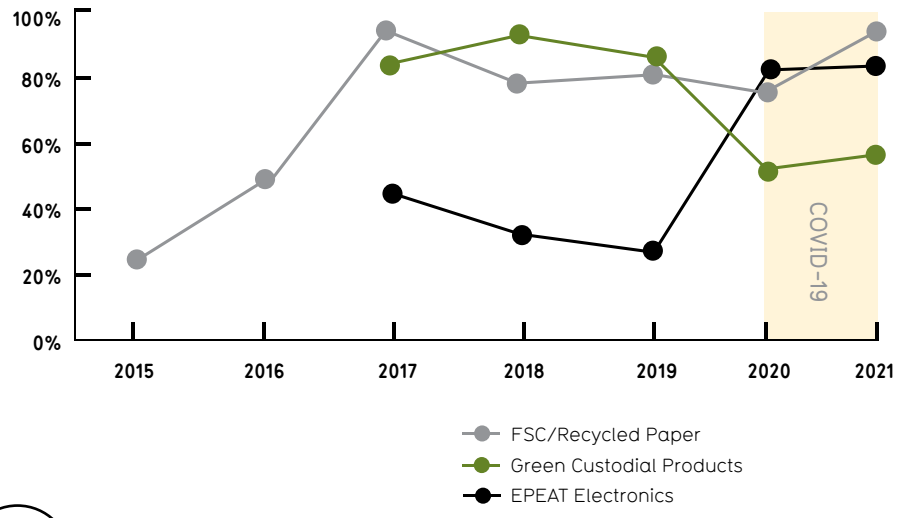
84.4% Of all major electronics purchased are certified to EPEAT Bronze or higher

54.5% Of all janitorial cleaning and paper products have an environmental certification

Sustainable procurement is multifaceted and requires tailored approaches for each purchasing decision. Considerations related to procurement include the quality and durability of products, circularity in design, lifecycle costs to power and operate, and the social and environmental policies and practices of vendors in Waterloo's supply chain.

In 2021, Waterloo completed its lifecycle costing guideline and calculation template, creating a system for evaluating the long-term costs of purchasing decisions, beyond the purchase price, with an emphasis on energy-consuming products. The campus continued to track purchases of products with credible Eco Labels in key product categories, as shown in **Figure 11**. 2020 and 2021 saw a major increase in sustainably-certified IT equipment, while there were major decreases in sustainably-certified cleaning chemicals. Waterloo also implemented a disclosure framework for new vendors to the campus to understand the sustainability of its supply chain.

Figure 11: Purchases Meeting Sustainability Criteria (% of Total)



In each of these areas, there are important opportunities and considerable gaps. Processes must be strengthened to improve accuracy and completeness of collected information, centralized policies and guidelines should be updated to align with best practices, and staff must be given the resources and decision-making authority to prioritize sustainable options.

CASE STUDIES

DISCLOSING SUPPLY CHAIN SUSTAINABILITY

As part of its supply chain disclosure framework, Waterloo asked recent vendors to provide information on their corporate policies and practices related to sustainability in the following areas:

1. Corporate targets for waste, emissions, and supply chain management
2. Climate action planning
3. Sustainability/CSR reporting
4. Environmental policies
5. Staff support
6. Signatory/participant in voluntary initiatives

The rollout had limited initial participation, due to a mix of staffing constraints and pandemic challenges, leading to responses from only 14% of vendors. Of those who participated, a small portion showed promising progress. Less than 20% of respondents had a climate action plan or targets, few had sustainability reports, and less than half provided credible environmental policies. Efforts for 2022 will prioritize improving the response rate to improve the representativeness of the data and exploring options to support vendors to be more ambitious in their corporate actions.

SUPPORTING GREEN IT

Throughout 2021, Information Services and Technology and the Sustainability Office completed a joint project to better integrate sustainability considerations in IT procurement and operational decisions. This led to the standardization of EPEAT certification for the Desktop Rollover and mobile phone programs, exploration of practices to better manage and more efficiently use existing equipment, development of a website with information on Sustainable Technology, presentations to multiple campus groups to build support for related efforts, and re-launch of the Green IT group to continue pan-University efforts.

ENGAGEMENT

Communications

Supporting UN SDGs:

PROGRESS SNAPSHOT

OBJECTIVE E1: By 2020, Waterloo broadly distributes timely and audience-relevant information about sustainability initiatives and opportunities within the campus community

Mostly complete

INDICATORS:

26,400	Visitors on the sustainability website
9,000	Sustainability report views and downloads
28,300	Engagements on social media channels
3,900	Total followers on social media channels
4	Campus-wide engagement campaigns

QUICK FACTS

- Waterloo hosts Waste Week, Bike Month, Earth Month, and Eco-Summit campaigns to create opportunities for engagement, education, and advocacy
- Central communications are available through the Sustainability Office Instagram, Twitter, and LinkedIn channels, and through a monthly Newsletter
- The Sustainability website hosts centralized information on campus sustainability resources, services, and commitments/progress

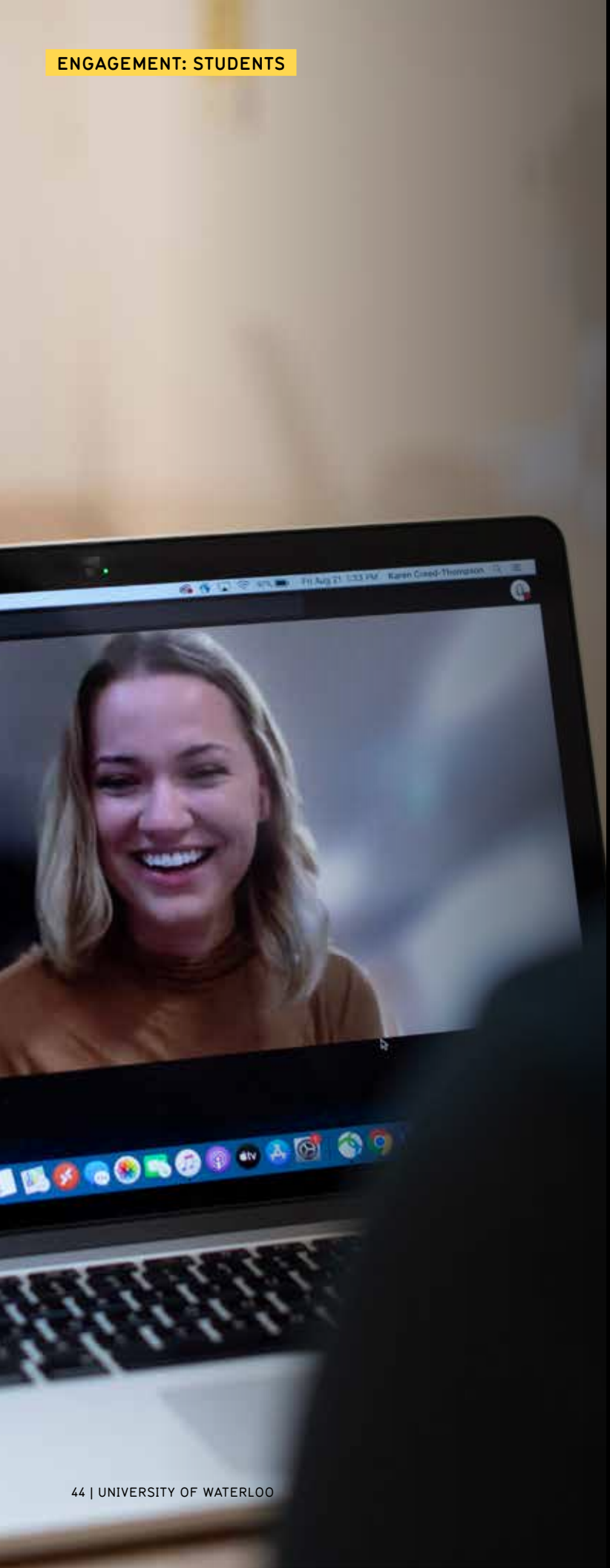
CASE STUDIES

VOLUNTEERING FOR GREEN

In May 2022, the Sustainability Office launched the Green Volunteer program. This program supports the Waterloo community in championing sustainability on campus. The program currently has 20 volunteers that support events, booths and campaigns hosted by the Sustainability Office. The goal of the program is to further embed sustainability into the campus culture by highlighting tools and resources in the community.

COPING WHEN THE WORLD IS ON FIRE

Feeling angry about the lack of action on sustainability? Maybe you have been impacted by climate change personally? Or perhaps you're sad or worried about the future? Navigating these feelings of eco-grief or eco-anxiety was the topic of conversation for a panel event hosted collaboratively by Campus Wellness and the Sustainability Office as part of Thrive 2021. The event brought together diverse student perspectives, as well as professional insight from Counseling Services, to talk about the validity of these feelings and tangible strategies to manage them. An ongoing series of eco-anxiety open conversations will take place throughout 2022.



Students

PROGRESS SNAPSHOT

OBJECTIVE E2: By 2020, additional programming is developed for incoming students during orientation and in residences to encourage sustainable living on campus

Mostly complete

INDICATORS:

TBC Percent of first year students reached by sustainability programs

OBJECTIVE E3: By 2018, establish a sustainability leaders program in partnership with students from residences, clubs and societies, student government, and for students in off-campus housings

Complete

INDICATORS:

7 distinct pathways for student leadership, including through Green Residence program, Living Planet @ Campus, Student Groups, O-Week coordinators, SDG Student Hub, and formal advisory committees

Student engagement is a major focus of Waterloo's outreach activities. There are numerous opportunities for students to get involved in campus sustainability, from clubs to Sustainability Office programs, advisory committees to the newly formed WUSA Student Sustainability Committee and the longstanding Impact Alliance network.

Students continued to utilize these programs throughout 2021, though participation was more challenging with restrictions on in-person activity. With campus engagement returning, it is critical to create new opportunities to reach those not already interested in sustainability and support sustainable living skills and behaviours, especially for incoming students. Efforts related to orientation and residence programming will play a role in such efforts.

QUICK FACTS

- Waterloo has over 14 student clubs connected to sustainability
- The WUSA Sustainability Commissioner and Sustainability Committee create opportunities for student advocacy
- The Green Residence Program creates tangible opportunities for peer leadership in Campus Housing
- The Living Planet @ Campus program provides an opportunity for student learning
- Students have dedicated positions on the President's Advisory Committee on Environmental Sustainability

CASE STUDIES

SUPPORTING YOUTH IN ACTION

In March 2022, the Sustainability Office hosted the Youth In Action event, in collaboration with the University of Guelph and University Guelph-Humber. The event provided students with an opportunity to network with organizations in Canada who support youth leadership in sustainability. The event sparked many discussions and allowed students to actively become engaged with participating organizations. The Sustainability Office will continue to lead future Youth In Action events along with partnering institutions.

CONNECTING FOR CLIMATE

Waterloo Climate Institute collaborated with five global universities across four continents to launch Climate Connect, a program to promote international networking across student and academic career stages. The program provides opportunities to learn about diverse perspectives on sustainability and experiences of the climate crisis, and responses to it, across regions. The first cohort had 10 students participate alongside 5 facilitators from Waterloo.

BUILDING SUPPORT ACROSS FACULTIES

The WUSA Sustainability Project launched the Student Sustainability Committee (SSC) in early 2022. Chaired by the Sustainability Commissioner, the SSC is composed of undergraduate students from every faculty on campus. The SSC seeks to break down silos of sustainability activism and centralize sustainability as a core value within the student body. SSC hosted a town hall, faculty-specific career fairs, green lab projects, and more. The SSC continues to make sustainability more accessible and relevant to every Waterloo student.

LIVING GREEN IN RESIDENCE

In 2021, the Green Residence program shifted its focus to support professional development for Ambassadors, given pandemic restrictions. Students within the program completed a customized professional development training series and took action to support sustainable living in residences. As in-person activities resumed in early 2022, Ambassadors hosted a Use and Reuse event that allowed students to swap gently used items for items they will find more use for. Effort for 2022/23 will include growing and strengthening the program to promote sustainable living in residences.

DESIGNING THE WARRIOR HOME

The Warrior Home student design team at Waterloo received $50,000 and advanced to the next stage of the Solar Decatholon Build Challenge, a contest sponsored by the U.S. Department of Energy to design and build energy efficient houses. The 50-student team has secured $155,000 from a variety of sources and will be working on the home design and construction through spring of 2023. The team placed second in the finals of the competition in 2021.

Employees

PROGRESS SNAPSHOT

OBJECTIVE E4: By 2025, increase from 5% to 25% the proportion of university departments that are Green Office

Mostly complete

INDICATORS:

18% University departments achieving at least Green Office Bronze

4 Certified Green Labs

~6% Participation in Sustainability Certificate

QUICK FACTS

- 30 departments have received a certification for the Green Office or Green Labs programs
- Waterloo offers the Sustainability Certificate for departments and individuals to build a foundation of sustainability competence and knowledge across employees

CASE STUDIES

REVISING THE SUSTAINABILITY CERTIFICATE

In 2022, the Sustainability Office updated the structure and delivery of the Sustainability Certificate. This two-session course highlights key themes and challenges in environmental sustainability, and outlines solutions employees can integrate into their role at Waterloo. The Certificate is available independently and for departments seeking an experience tailored to their team. Additional courses are available for employees looking to learn more about climate change and energy, sustainable travel, waste, sustainable food, and biodiversity.

PILOTING GREEN LABS

Labs are hubs of teaching and research activity on campus. They are also major consumers of energy, water, and chemicals, and can generate substantial waste. The Sustainability piloted the Green Labs program in 2021 to provide an opportunity for teaching and research labs to take concrete actions to reduce their footprint. With four tiers of certification and a flexible approach to account for the unique equipment and activities for each lab, the program engaged four pilot labs over the past year, all of whom reached Level 2 in the framework!

Congratulations to the following labs:

› Ecology Lab
› Plant Ecology Lab
› Quantum-Nano Fabrication and Characterization Facility (QNFC)
› Velocity

GREEN OFFICE SNAPSHOT

Waterloo's Green Office program continued to engage employees at academic and non-academic offices across campus. By providing a common scorecard to brainstorm and track action, a network of ambassadors to build best practices, and resources to support implementation, the program is building a bottom-up culture of sustainability.

Certified departments include, as of August 2022 (brackets for # of points):

GREENOFFICE PLATINUM CERTIFIED

Green Office Platinum
Centre for Teaching Excellence (134)
Centre for Extended Learning (127)
Dean of Environment (126)

GREENOFFICE GOLD CERTIFIED

Green Office Gold
Plant Operations – Design (107)
Work-Integrated Learning Programs (117)

GREENOFFICE SILVER CERTIFIED

Green Office Silver
Dean of Engineering (96)
Dean of Health (86)
Economics (73)
Office of the President (76)
Print & Retail Solutions (77)
Recreation & Leisure Studies (83)
Registrar's Office (96)
Renison English Language Institute (82)
School of Environment, Resources & Sustainability (96)
St. Jerome's University College (94)
Student Success Office (83)
Water Institute (79)

GREENOFFICE BRONZE CERTIFIED

Green Office Bronze
Centre for Career Action (56)
Civil & Environmental Engineering (52)
Finance (69)
Institutional Analysis & Planning (55)
Office of Research (63)
Plant Operations –Environmental Services (59)
Political Science (66)
Social Development Studies, Renison (68)

Community

PROGRESS SNAPSHOT

OBJECTIVE E4: By 2020, Waterloo is recognized as a sustainability leader in Waterloo Region

Complete

INDICATORS:

4 Local sustainability awards since 2016

16 Local non-academic community partnerships, memberships, board roles, or advisory involvement related to sustainability since 2016

ADVANCING THE SDGS TOGETHER

TOGETHER | ENSEMBLE

In March 2022, Sustainable Development Solutions Network (SDSN) Canada, hosted at Waterloo, launched an all of society conference to advance action on the UN Sustainable Development Goals. The Together | Ensemble conference brought together researchers, civil society, government, and industry leaders for in-depth discussions about the SDGs in the Canadian context, connected work happening across the country, new opportunities and partnerships for impact, and effective research and policy mobilization work. The conference was supported by the Government of Canada's SDGs funding program.

MAPPING GLOBAL CLIMATE NETWORKS

As part of its membership in the University Global Coalition (UGC), Waterloo teamed up with University at Buffalo and University Carlos III at Madrid to analyse the characteristics of global climate change networks among the higher education sector. The study found over 30 national, regional, or international climate-related networks with substantive postsecondary involvement or leadership, covering everything from education to policy advocacy to campus action to research. The project team mapped these networks visually and provided recommendations for networks and individual campuses to consider overlap, gap areas, and global inclusivity when deciding to launch or join climate networks.

GOVERNANCE AND BENCHMARKING

PROGRESS SNAPSHOT

OBJECTIVE G1: By 2025, achieve and maintain a STARS Gold designation through the Association for the Advancement of Sustainability in Higher Education

Somewhat complete

INDICATORS:

SILVER STARS Silver Designation earned in November 2018

FORMAL POLICIES, MEMBERSHIPS, PRACTICES, AND COMMITMENTS

The following are a list of key internal and external guidelines and commitments made by the University of Waterloo to support its sustainability efforts.

Internal:

› Adoption of Responsible Investment Advisory Group recommendations for carbon reduction measures and climate change considerations in investment activity (2021)
› Lifecycle costing guideline (2021)
› Net Neutral New Building Guideline (2021)
› Adoption of Responsible Investment Working Group recommendations for integration of ESG considerations in investment decisions (2018)
› Policy 53: Environmental Sustainability (2017)
› Environmental Sustainability Strategy (2017)
› Waste and recycling standard (2017)
› Centralized office printers defaulted to double-sided printing
› Campus Master Plan includes sustainability aspects as defining features of campus development (2009)
› High efficiency lighting retrofits mandated during renovations
› Eliminated use of chemical pesticides (1998)

External:

› Signatory to UN Race to Zero (new 2021)
› Member of the Regional Sustainability Initiative, managed by Sustainable Waterloo Region, and Bronze Pledging Partner for waste (2017) and climate change (2021)
› Founding Member of University Global Coalition (2020)
› Signatory to Investing in Climate Change Charter (2020)
› Signatory to UN PRI (2020)
› Member and host institution for Sustainable Development Solutions Network Canada (2018)
› Signatory to 2017 Council of Ontario Universities commitment to design a roadmap to a low-carbon campus (2017)
› Member of the Association for the Advancement of Sustainability in Higher Education (2015)
› Member of TravelWise, managed by the Region of Waterloo and Sustainable Waterloo Region (2012)
› Signatory to Council of Ontario Universities Pledge, Ontario Universities, Committed to a Greener World (2009)

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