UNIVERSITY OF TORONTO

President's Advisory Committee on the Environment, Climate Change, and Sustainability

2021 ANNUAL REPORT

November 2021

Committee members: John Robinson (Co-Chair), Ron Saporta (Co-Chair), Andrew Arifuzzaman, Aimy Bazylak, Tenley Conway, Marc Couture, Lisa DeMarco, Steve Easterbrook, Alexandria Gill, Amanda Harvey-Sánchez, Hilary Inwood, Nicole Klenk, Jan Mahrt-Smith, Daniella Mallinick, Liat Margolis, Kim McLean, Fiona Miller, Derek Newton, Karen Shim, Shannon Simpson, and Romila Verma

Research Assistants: Sean Cameron, Melody Chan, Jenna Im, Cedric Jiang, Mariam Khan, Ada Tulay, and Ryan Wang

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CECCS Secretariat Staff: Ayako Ariga, Dione Dias and Conchita Ferrao

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UNIVERSITY OF TORONTO

OFFICE OF THE PRESIDENT

Meric S. Gertler, CM, FRSC, FBA, FAcSS
President

A Message from the President

In December 2020, I was delighted to announce an extension to the mandate of the President's Advisory Committee on the Environment, Climate Change, and Sustainability (CECCS) to the end of December 2023. At that time, I also offered congratulations to Professor John Robinson on his reappointment to a second three-year term as Presidential Advisor on the Environment, Climate Change, and Sustainability, and to Mr. Ron Saporta for his appointment as Co-Chair of the Committee.

Since then, the CECCS has adopted a new organizational framework with new cross cutting themes and subcommittees that enhance the Committee's ability to make sustainability a key component of U of T's mission. The Committee has also been strategic in its use of resources by establishing multiple sustainability initiatives and then turning them over to a more permanent U of T home—thereby embedding sustainability in various divisions and offices across the University.

The theme of this year's annual report is the United Nations Sustainable Development Goals (SDGs). As I indicated in my recent announcement to divest from fossil fuel investments and create a climate-positive campus, in light of the increasing urgency of the climate crisis, this is an opportune moment to commit to even more ambitious carbon reduction goals for the University's long-term investments. It is also time to accelerate our action on the SDGs, including but going far beyond SDG 13 for climate action. In the pages that follow, you will see that the Committee's work focuses on innovations concerning all 17 intersecting SDGs.

Please join me in congratulating Committee members on a fourth year of significant achievements.

Sincerely,

Meric S. Gertler
President

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Executive Summary

The President's Advisory Committee on the Environment, Climate Change, and Sustainability (CECCS) was created in 2017. Its goals are: to make sustainability a key component of the University of Toronto (U of T) identity, to achieve local and international leadership in the integration of operational and academic sustainability, and to recognize, share and aggregate good sustainability practices across the university.

This report discusses the accomplishments of CECCS since the last annual report in November 2020. Where appropriate, a broader context with regard to the developments over the last four years is provided. The theme of this report reflects the overall goal of CECCS to integrate the United Nations (UN) Sustainable Development Goals (SDGs) into sustainability activity across U of T.

The CECCS received an extension to the mandate that was supposed to end in December 2020, to now end in December 2023. Along with this three-year extension, Ron Saporta, Chief Operating Officer, Property Services and Sustainability, was added as a Co-Chair to CECCS to reinforce the integration of operational and academic sustainability.

In this new stage, the CECCS undertook a reorganisation of the CECCS framework to better align with the University's areas of interest and expand our reach across the University. Instead of the three subcommittees (Agent of Change, Campus as a Living Lab, and Curriculum Innovation), a new four subcommittee structure was introduced (Teaching & Learning, Research, Operations, Engagement & Partnerships). Four cross-cutting themes were added: Agent of Change, Campus as a Living Lab (CLL), the United Nations (UN) Sustainable Development Goals (SDGs), and Student Leadership.

Subcommittee Chairs were also introduced in order to engage the CECCS members more in the various CECCS activities. The following lists some illustrative activities within each of the four new subcommittees.

- Teaching & Learning - Sustainability Pathways Program, Sustainability Course Inventory, Community-Engaged Learning (CEL) work & CEL course inventory, CLL/CEL project database
- Research - Urban Climate Action Network Project, SDG Institutional Strategic Initiative (ISI), Transdisciplinary co-production workshops, Adams Championship Internship
- Operations - Climate Positive Plan, CLL projects, Scope 3 Emissions (including Air Travel Emissions Mitigation Initiative), Sustainability Offices and Tri-Campus Sustainability Board
- Engagement & Partnerships - International Networks: U7+ & UC3, Adams Sustainability Celebration, Green Will Initiative, Sustainable Buildings Canada Boot Camp

From September 2020 to January 2021, the CECCS launched the inaugural virtual Adams Sustainability Celebration featuring live virtual panels, virtual showcases and a virtual Adams Sustainability Innovation Prize Competition and Sustainability Grants Awards event. Over 500 people joined in this tribute to the growing community of sustainability-minded students, faculty, and staff, made possible by the generous donation of Wendy Adams. The next iteration of the Adams Sustainability Celebration is planned for early 2022.

1. Extension of CECCS Mandate

In December 2020, in response to a proposal from the CECCS, President Gertler announced in a Governing Council meeting that the term of the CECCS, and of the then-Chair's position as Presidential Advisor, have been extended for another three years, and the CECCS budget would be doubled to allow for hiring more staff. The CECCS' mandate will now expire on December 31, 2023, six months after the President's term ends, thus ensuring continuity into the new administration in 2023. This decision and the positive feedback received from the President, Vice-Presidents, and Governing Council are both testament to the achievements of CECCS but also a call for further action.

The President also announced that the Committee would be henceforth co-chaired by Professor John Robinson and Ron Saporta. Professor Robinson is currently the Presidential Advisor on the Environment, Climate Change, and Sustainability and is a faculty member at the Munk School of Global Affairs and Public Policy and the School of the Environment, and Ron Saporta is the Chief Operating Officer, Property Services and Sustainability. The collaborative leadership between the two co-chairs signifies the unique and important connection the Committee has achieved between academic and operational activities.

1.1 New Organizational Framework (2-4-4)

Over the four years of operation since its creation in 2017, the CECCS pursued its goals through three CECCS subcommittees: Campus as a Living Lab (CLL), University as Agent of Change in the Community (AOC), and Curriculum Innovation (CI). The key strategies of these committees were to promote the integration of operational and academic sustainability through 'campus as a living lab' projects (CLL), to develop partnerships on sustainability issues with the various communities internally and outside U of T (AOC), and to make sustainability curriculum opportunities available to students (CI). Across the activities of these subcommittees, the CECCS has identified, facilitated, supported, enabled, and promoted sustainability initiatives across all three campuses. This has been accomplished through leveraging individual campus identities, fostering a sense of common purpose, and bringing together existing sustainability networks and connections at U of T and in the community.

The extension of the CECCS mandate, together with the increase in budget, led to discussion as to the future activities of the CECCS. This in turn led to the new organizational framework described here.

The overall goals of the CECCS remain the same. They are:

- Sustainability as a key component of the U of T identity
- International leadership in operational and academic sustainability
- Enabling and embedding disparate sustainability activities

2 overarching principles

- Regenerative Sustainability looks for net positive ways to increase both human and environmental wellbeing, instead of simply focusing on reducing environmental damage.
- Integration of Operational and Academic Sustainability looks at ways to combine research, teaching, partnerships, and operations.

4 cross-cutting themes

- Campus as a Living Lab (CLL) involves addressing operational sustainability issues by connecting students, faculty, staff, and potentially external partners, on CLL projects. CLL works to create opportunities for students to use the campus as a test bed for sustainability by connecting academic and operational activities.
- University as Agent of Change (AOC) involves building partnerships off-campus with organizations in the public, private, and civil society sectors, and with other universities. Through these partnerships, AOC works to contribute to the societal transitions for sustainable futures.
- United Nations Sustainable Development Goals (SDGs), which CECCS uses (i) to orient our understanding, across all of our activities, of the many dimensions of sustainability across the campus, and (ii) to develop all of our sustainability inventories.
- Student Leadership reflects our view that students are agents of change in the university and in the world after graduation. The CECCS aims to engage students in sustainability governance, research and publications, and living lab projects on and off campus.

4 Subcommittees

- Teaching & Learning (3.1) - The Teaching & Learning Subcommittee has inherited the mandate of the former Curriculum Innovation Subcommittee which was to support the development of sustainability curriculum pathways for every undergraduate student. It also provides guidance on instilling sustainability in community-engaged learning initiatives and student workshops.
- Research (3.2) - The Research Subcommittee aims to support and bring together sustainability researchers into a community of practice and enhance relevant research initiatives.
- Operations (3.3) - The Operations Subcommittee combines most of the former Campus as a Living Lab Subcommittee mandate and that of the Tri-Campus Sustainability Board.
- Engagement & Partnerships (3.4) - The Engagement & Partnerships (E&P) Subcommittee has taken over most of the responsibilities of the former Agent of Change Subcommittee, to promote U of T's local and international sustainability partnerships.

See Figure 1 for a table of ongoing Initiatives and their cross-cutting themes.

Subcommittees	CLL	AOC	SDGs	Student Leadership
Teaching & Learning				
Pathways	xx	x	x	xx
Course inventory			xx	xx
CEL work & CEL inventory	xx	xx	xx	xx
CLL/CEL project database	xx	xx	x	xx
Research				
Urban Climate Action Network (UCAN)		xx	x	
SDG Institutional Strategic Initiative (ISI)			xx	x
Transdisciplinary co-production workshops		xx		x
Adams Championship Interns	x	xx	x	xx
Operations				
Climate Positive Plan	xx	x	x	
CLL projects	xx	x	x	xx
Scope 3 Emissions (including ATEMI)	xx	x	x	
Sustainability Offices and Tri-Campus Sustainability Board	xx			
Engagement & Partnerships				
International Networks: U7+ & University Climate Change Coalition (UC3)		xx	x	
Adams Sustainability Celebration	x	xx	x	x
Green Will Initiative		xx	x	
Sustainable Buildings Canada (SBC) Boot Camp	xx	xx	x	xx
Completed Initiatives				
Business Air Travel Report	xx	x		x

Figure 1 Initiatives by Subcommittee and Cross-Cutting Themes

x = touches on this cross-cutting theme, xx = focuses on this cross-cutting theme

1.2 Membership Renewal

At the time of the mandate extension in December 2020, there were 22 CECCS members. After discussion with the President, a decision has been made to have 10 of the 22 members roll over to serve until December 2021 to ensure a smooth transition, as new members are appointed. The remaining seats were filled through new appointments and two calls for nominations, with a term of 2 years until the end of December 2022. The second call for nominations was for an additional staff representative seat and was issued at the recommendation of two members of the Governing Council. (See Appendix 1 for the two calls for nominations).

The original plan was to have new calls for nominations at the end of 2021 and 2022 so that there would be 50% new members for seats designated for open selection every year. However, given the time required to develop and implement the new organizational framework and hire new staff, in October 2021 the Co-Chairs were granted permission from the President to extend the returning members' term by one year, until December 2022, and the term of new members selected in 2021 to be extended until December 2023.

There will be a last open call for nominations in late 2022 to replace the members who carried on from before the mandate extension. The new members selected in 2022 will serve a one-year term until the end of 2023.

In December 2020, the membership makeup was: 10 faculty members, including the Chair; 2 students; 1 alumna; 4 staff members; and 4 additional subcommittee members, for a total of 21 members.

In July 2021, the new membership was confirmed as: 10 faculty members, including the Co-Chair; 2 students; 1 alumna; and 10 staff members, including the Co-Chair, totalling 23 members. The six additional staff seats are:

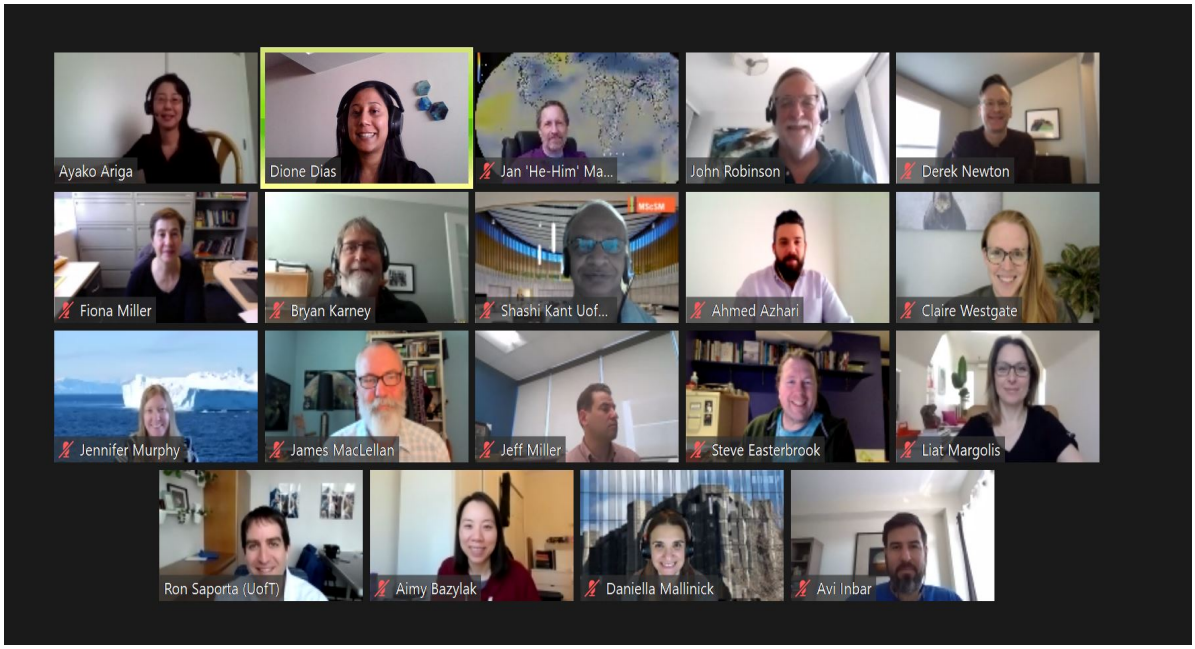
- 1 appointed seat for a representative of the Indigenous community leadership on campus
- 1 appointed seat for a chief administrative officer from one of the divisions on UTSG
- 1 appointed seat for a chief administrative officer from UTM
- 1 appointed seat for a chief administrative officer from UTSC
- 1 appointed seat for the director of the Sustainability Office on UTSG
- 1 open call seat - filled by the communications associate in the Office of the VP & Provost for 2021-23

The net effect of these changes was to strengthen and deepen the staff membership of the committee, permitting a stronger focus on embedding sustainability in both the operational and academic administration activities of the university.

See Appendix 2 for the 2021 full membership list.

All members will serve on at least one of four subcommittees. The full Committee and the four Subcommittees meet at least once per semester. (See Appendix 3 for the list of CECCS and

subcommittee meetings held in 2020-21). The subcommittee chairs have been chosen from the 23 committee members and appointed by the Co-Chairs.



CECCS Committee Meeting, Winter 2021

1.3 Secretariat Expansion

In December 2020, CECCS received approval from President Gertler to double the staff in the Secretariat in order to further the work of CECCS. After careful thought and consideration, it was decided that a Director and Administrative Coordinator would be added to the Secretariat.

The Administrative Coordinator position helps build more administrative processes into the Committee, alleviating the Project Managers of the more administrative tasks and allowing them to work on project-related work. Conchita Ferrao was hired for this position in September 2021.

The Director position allows for more strategic oversight of the Committee by working with the Co-Chairs to build a more coordinated strategic vision, alleviates some of the tasks from the Co-Chairs, and provides management support to the Project Managers and Administrative Coordinator. The search for the new Director is ongoing.

With the introduction of Ron Saporta as the Co-Chair, there has been more alignment and sharing of resources across sustainability at the St. George Campus, resulting in the co-location of the CECCS Secretariat close to the St. George Sustainability Office.

1.4 Goals Renewal Discussion

In late October 2021, the CECCS Secretariat and the four Subcommittee chairs met in a half-day strategizing retreat to: i) discuss CECCS goals, and ii) prioritize existing activities and the significant new opportunities and proposals that have come forward.

The overall goals for CECCS set in 2018 were:

- Sustainability a key component of U of T identity; and
- International leadership in operational and academic sustainability.

It was agreed that these goals should more explicitly address U of T's role as an anchor institution in the community.
Further, it was recognized that it was important to recognize, share, and aggregate the many innovative sustainability practices across three campuses, beyond those initiated or directly supported by CECCS. The CECCS should act as a vehicle for aggregation of sustainability activities across the University and help to mobilize that knowledge.

The result of this discussion was the following new set of goals for CECCS (new text in bold):

- Sustainability a key component of U of T identity.
- **Local and** International leadership in operational and academic sustainability; and
- **Recognition, sharing and aggregation of good sustainability practices across the university**.

The 2018 CECCS goals included goals for the three subcommittees (Campus as a Living Lab, Agent of Change, and Curriculum Innovation). As noted above the new organizational framework has four cross-cutting themes (Campus as a Living Lab, Agent of Change, SDGs, and Student Leadership). It was agreed that goals should be identified for the cross-cutting themes, but not for the subcommittees, so that each subcommittee would develop initiatives to address the cross-cutting theme goals as they applied to the activities of that subcommittee.

Proposed goals for the cross-cutting themes will be further refined and proposed to the CECCS membership for comments.

2. Overall Activities

2.1 UN SDGs as the Theme of 2021 Report

The CECCS' definition of the scope of sustainability is guided and motivated by the UN SDGs, which also provide the basis for all our inventories. The SDGs framework is widely accepted and shows the undeniable breadth and interconnectedness of sustainability issues.

Some prominent examples of CECCS' work in SDGs include the Adams Sustainability Celebration Event series, sustainability inventories, SDGs @ U of T Event, SDGs Institutional Strategic Initiative, Staff Workshop around SDGs, U of T's participation in the U7+ Alliance, and the Times Higher Education Impact Ranking submission support. Many of these initiatives are detailed later in this report in sections 2.3, 2.5, 3.2, and 3.4, respectively. There is a longer list of CECCS' initiatives that are guided by the SDGs agenda such as the sustainability curricular pathways (3.1.1), community engaged learning work (3.1.3), ten university comparison research project under the Adams Sustainability Championship Interns program (3.2.5), Student Agent of Change Workshop (3.3.1), Climate Positive Plan (3.3.3), Scope 3 Emissions plans (3.3.3), and participation in the University Climate Change Coalition (3.4.2).

The global COVID-19 pandemic has reinforced the shortcomings with social justice and equity, from access to healthcare, quality education, decent work and economic growth, sustainable cities and communities, and climate action, to name a few of the SDGs we strive to achieve. The pandemic has prompted us to think and do a lot more for community impact through embracing the human well-being aspects of sustainability and addressing the interconnectedness of the SDGs. From grassroots services to advising the regulatory bodies on equitable access to healthcare and education and partnering with the City of Toronto on emissions reduction targets to research, the CECCS and its members worked closely with many parts of U of T to incorporate the SDGs into the University's various activities.

We have selected the SDGs to be one of the cross-cutting themes for everything we do and for the theme of this annual report. This is a huge opportunity as well as a challenge, as the scope of SDGs is so large and interconnected; it challenges us to explore how we best reflect the framework in our institution. What the SDGs mean on an institutional level at U of T is an evolving discussion.

2.2 Embedding

The CECCS is set up as a free-standing, pan-university committee with no budgetary ties to any specific unit within the University. The Committee's formal accountability is to the President, although there is a shared understanding of the accountability to the broader U of T community as well. There is also an annual reporting to the Governing Council, which by nature is reporting to the community as the Governing Council is the representative body of the whole U of T community.

A key role for CECCS is to build a collective and inclusive narrative about sustainability for the institution. A collective narrative signifies that sustainability is a priority and involves all members of the U of T community. An Inclusive narrative represents the importance of everyone playing a role in sustainability. Creating a collective and inclusive narrative involves widening the scope of sustainability, in other words, 'what counts as sustainability'. By adopting the SDGs framework to define our understanding of sustainability and embracing its breadth, related fields previously excluded from the traditional scope of sustainability are included and have widened opportunities for industry, societal, and government stakeholders to partner with U of T.

The CECCS is not a permanent office but a committee, with its members serving as volunteers to provide direction and guidance on its strategies and activities. Our mandate is to institutionalize and instil sustainability in all facets of the University's life, from teaching and learning to research, to operations, and partnerships with the community. The CECCS therefore assumes an enabling role of conceptualizing initiatives/kickstarting the process, and then handing over the delivery in order to embed sustainability across the wide array of offices, functions, and activities at the University, instead of owning and executing programs on its own. The details of those initiatives that would not have started without CECCS but will be continued by other units are included in Section 2, "Subcommittee Activities," of this report. In addition, The CECCS will identify, support and celebrate sustainability activities initiated at U of T by other individuals, units, or Divisions. Examples are the ambitious sustainability plans developed at OISE and UTM (see case studies #1 and #2).

As of November 2021, CECCS has engaged all 9 Vice-Presidential offices (see Figure 2) and 9 of 18 divisions in initiatives to promote and coordinate sustainability.

CECCS Connections

CECCS Members

CECCS Subcommittee Members

Chancellor
Dr. Rose M. Patten

Chair of the Governing Council
Brian Lawson
Vice-Chair of the Governing Council
Janet Ecker

Secretary of the Governing Council
Sheree Drummond

President
Meric Gertler

Chief of Government Relations
Andrew Thomson

Director of Government Liaison
Forest Parlee

Senior Policy Advisor
Alexander Irving

Projects Coordinator
Munira Tayabali

Chief Strategy Officer
Nadina Jamison

Director, Strategic Research
Tony Gray

Assistant Vice-President, Office of the President & Chief of Protocol
Bryn MacPherson

Special Projects Officer
Susan Mazza

Manager, Correspondence Unit
Susanne Miskimmin

Admin Coordinator
Rheema Farrell

Chief Financial Officer
Trevor Rodgers

Controller and Director Financial Services
Pierre Piché

Director, Procurement Services
Renata Faverin

Senior Procurement Analyst & Project Lead
Lisa Myre

Vice President, Advancement
David Palmer

Assistant Vice-President, University Development
Gillian Morrison

Director, International Advancement
Jacob Wesolowski

Assistant Vice-President, Divisional Relations
Chantelle Courtney

Director, Major Gifts
Glenn Best

Program Manager, Major Gifts
Kerry Gauer

Associate Director, Major Gifts
Ylber Kusari

Vice-President, Communications
David Estok

Executive Director, Communications Strategy and Stakeholder Relations
Jane Stirling

Interim Director Communications Strategy & Planning
Christine Bezruki

Vice-President, Human Resources & Equity
Kelly Hannah-Moffat

Executive Director, Inclusion, Equity & Diversity
Karima Hashmani

Director, Indigenous Initiatives
Shannon Simpson

Vice-President, Operations & Real Estate Partnerships
Scott Mabury

Chief Operations Officer, Facilities & Service
Ron Saporta

Director, Sustainability and Energy Management
Marc Couture

Manager, Senior Utilities Reduction
Vic Cassano

Senior Manager
Scott Hendershot

Manager Senior Utilities Reduction
Larry Yang

Project Manager, Sustainability Office
Jennifer Puskar

Project Manager, Sustainability Office
Chelsea Dalton

Project Coordinator, Sustainability Office
Kayla LaChance

Chief of University Planning, Design & Construction
TBD

Assistant Vice-President, University Planning
Christine Burke

Managing Director, University Planning
David Sasaki

Senior Planning Associate
Michal Kuznair

Senior Planner
Adam Trotter

Chief Information Officer
Bo Wandshneider

Director, Online Learning Strategies
Laurie Harrison

Director, Academic and Collaborative Technologies
Avi Hyman

Assist Vice-President,Ancillary Services
Anne McDonald

Executive Director, Food & Beverage & Campus Events
Colin Porter

Vice-President & Provost
Cheryl Regehr

Dean, Faculty of Arts & Science
Melanie Woodin

Chief Administrative Office
Kim McLean

Vice-President, Research and Innovation, and Strategic Initiatives
Edward (Ted) Sargent

Associate Vice-President, and Vice-Provost Strategic Initiatives
Christine Allen

Assistant Vice-President, Innovation, Partnerships, and Entrepreneurship
Derek Newton

Managing Director, UTE
Jon French

Program & Business Services Coordinator
Melanie Langemeyer

Associate Vice-President, Research & Innovation
Leah Cowen

Director, Centre for Research & Innovation
Vinita Haroun

CRIS Collaborative Programs Off
Krystyna Kongats

Director, Strategic Engagement
Stephannie Roy

Manager Cross Divisional Initiatives Development
Kenneth Meiklejohn

Director, Research Strategy & Excellencet
Simon Pratt

Interim Vice-President, International
Joseph Wong

Executive Director, Int. Partnerships
Gwenyth Burrows

Director, International Relations,
Vanessa Laufer

International Officer
Julia Kulik

Vice-President, and Principal, UTM
Alexandra Gillespie

Chief Administrative Officer UTM
TBC

Executive Director, Facilities, Management, Planning
Tammy Cook

Director, Utilities & Sustainability
Ahmed Azhari

Senior Energy Engineer
Ali El-Sayed

Sustainability Manager, Strategic Initiatives
Beverley Ayeni

Vice-President, and Principal, UTSC
Wisdom Tettey

Chief Administrative Officer UTSC
Andrew Arifuzzaman

Director, Facilities Management
Jeffrey Miller

Manager Energy Management & Design
Deepal Patel

Manager, Sustainability
Patricia Escobar

Coordinator, StuLife&Sustainability Programs
Nadine Leone

Vice Principal Academic & Dean Professoriate Tn-Stream, UTSC
William Gough

Vice-Provost, Academic Programs, and Innovations in Undergraduate Education
Susan McCahan

Director, Academic Programs, Planning & Quality Assurance
Daniella Mallinick

Coordinator, Academic Change
Jennifer Francisco

Communications Associate
Karen Shim

Director, Office of the Vice-Provost, Innovations in Undergraduate Education
Julian Weinrib

Vice-Provost, Student
Sandy Welsh

Executive Director, Student Life Programs & Services
Heather Kelly

Director, Student Engagement
Adam Kuhn

Lead, Systems & Data Management
Nilton Gaspar

Assistant Director, Experiential Learning & CCP
Jennifer Esmail

Academic Initiative Lead Coordinator
Heather Hermant

Executive Director, Student Experience
David Newman

Manager, Strategic Initiatives
Kimberly Elias

Executive Director, Enrolment Services & University Registrar
Richard Levin

Director, Financial Aid
Donna Wall

Manager of University Awards
Loraine Au Tham

List of CECCS Connections by Division

Green = CECCS or subcommittee members

Purple = CECCS emeritus members

Blue = CECCS connections

Faculty of Applied Science & Engineering

- **D. Grant Allen**, Chair, Department of Chemical Engineering and Applied Chemistry
- **Aimy Bazylak**, Department of Mechanical & Industrial Engineering
- **Timothy Bender**, Department of Chemical Engineering and Applied Chemistry
- **Sharon Brown**, Assistant Director, Cross-Disciplinary Programs
- **Mel Duhamel**, Research Associate, Department of Civil & Mineral Engineering
- **Tamer El-Diraby**, Department of Civil & Mineral Engineering
- **Bryan Karney**, Associate Dean, Cross-Disciplinary Programs
- **Heather MacLean**, Department of Civil & Mineral Engineering
- **Eric Miller**, Department of Civil & Mineral Engineering and Director, U of T Transportation Research Institute
- **Marianne Touchie**, Department of Civil & Mineral Engineering

John H. Daniels Faculty of Architecture, Landscape, and Design

- **Petros Babasikas,** Director, HBA Architectural Studies Program
- **Hans Ibelings**
- **Alstan Jakubiec**, Daniels Faculty of Architecture, Landscape and Design / The School of the Environment
- **Robert Levit**, Associate Dean Academics
- **Liat Margolis**, Associate Dean Research
- **Andrea McGee**, Registrar

Faculty of Arts and Science

- **Ariana Bradford**, Executive Director, Munk School of Global Affairs & Public Policy
- **Heather Bruce**, Global Internships Coordinator, Munk School of Global Affairs & Public Policy
- **Kiran Champatsingh**, Communications Officer, School of the Environment
- **Michael Classen**, Coordinator, Certificate in Sustainability, School of the Environment
- **Jessica D'eon**, Undergraduate Associate Director, School of the Environment
- **Steve Easterbrook**, Director, School of the Environment
- **Paolo Granata**, St. Michael's College
- **Martha Harris**, Assistant Director, Governance & Curriculum
- **Tamara Jones**, Associate Director, Enrolment Service and Records,
- **Helena Juenger**, Student Placement Coordinator, Department of Germanic Languages & Literatures
- **Kim McLean**, Chief Administrative Officer
- **Andrea Muehlbach**, Department of Anthropology
- **Jennifer Murphy**, Department of Chemistry
- **John Robinson**, Presidential Advisor on the Environment, Climate Change, and Sustainability
- **Stephen Scharper**, Director of Sustainability, Trinity College / School of the Environment
- **Stefan Soldovieri**, Chair, Department of Germanic Languages & Literatures
- **Nicole Spiegelaar**, School of the Environment

- **Romila Verma**, School of the Environment
- **Clare Wiseman**, School of the Environment

Ontario Institute for Studies in Education

- **Hilary Inwood**, Coordinator, Sustainability & Climate Action Network
- **David Montemurro**, Associate Director, Master of Teaching Program
- **Jennifer Sumner**, Assistant Professor, Adult Education and Community Development Program
- **Jenaya Webb**, Public Services & Research Librarian, OISE Library
- **Fikile Nxumalo**, Assistant Professor, Dept. of Curriculum, Teaching & Learning
- **Elisabeth Rees-Jonstone**, Executive Director, Continuing & Professional Learning

Rotman School of Management

- **Kenneth Corts**, Vice-Dean, Research, Strategy & Resources
- **Jan Mahrt-Smith,** Academic Director, Full-Time MBA Program and cross-appointed to the School for the Environment
- **Rod Lohin**, Executive Director, Michael Lee-Chin Family Institute for Corporate Citizenship, and Senior Lecturer
- **Anita McGahan,** Rotman School of Management and the Munk School of Global Affairs & Public Policy

Faculty of Music

- **Farzaneh Hemmasi**, Department of Music and School of Cities

Dalla Lana School of Public Health

- **Paula Braitstein,** Epidemiology Division / Centre for Global Health
- **Lissa Ceolin,** Occupational & Environmental Health Division
- **Erica Di Ruggiero**, Center for Global Health / SDGs ISI Co-Chair
- **Fiona Miller**, Chair in Health Management Strategies, Institute of Health Policy, Management and Evaluation
- **Sarah Patton**, Research Officer, Centre for Sustainable Health Systems, Institute of Health Policy, Management and Evaluation
- **Nicole Simms**, Managing Director, Centre for Sustainable Health Systems, Institute of Health Policy, Management and Evaluation
- **Helen Valkanas,** Research Officer, Centre for Sustainable Health Systems, Institute of Health Policy, Management and Evaluation

University of Toronto Mississauga

- **Diana Aldaz**, Sustainability Projects & Engagement Coordinator, Master of Science in Sustainability Management Program, Institute for Management & Innovation
- **Tenley Conway**, Associate Chair, Research, ENV Management Program advisor, Geography, Geomatics and Environment
- **Monika Havelka**, ENV Program director and ENV Science Program advisor, Geography, Geomatics and Environment
- **Shashi Kant**, Director, Master of Science in Sustainability Management Program, Institute for Management & Innovation
- **Michael Liut**, Department of Mathematical and Computational Sciences
- **Barbara Murck**, Geography, Geomatics and Environment
- **Claire Westgate**, Placement & Employer Relations Officer, Master of Science in Sustainability Management

Program, Institute for Management & Innovation

University of Toronto Scarborough

- **Marc Cadotte**, Department of Biological Sciences/ SDGs ISI Co-Chair
- **Nicole Klenk**, Department of Physical and Environmental Science
- **Jim MacLellan**, Director, Environmental Studies Program, Department of Physical and Environmental Science
- **Ana Martinez**, Department of Physical & Environmental Sciences

No contacts yet

School of Continuing Studies
Faculty of Dentistry
Faculty of Information
Faculty of Kinesiology and Physical Education
Faculty of Law
Faculty of Medicine
Lawrence S. Bloomberg Faculty of Nursing
Factor-Inwentash Faculty of Social Work

Case Study #1 - OISE's Sustainability and Climate Action Plan

By Dr. Hilary Inwood, Lecturer, OISE

As the centre of educational studies at the University of Toronto, the Ontario Institute for Studies in Education (OISE) has been working to better develop Environmental & Sustainability Education (ESE) since 2008. The establishment of its ESE Initiative brought faculty, staff and students together who shared an interest in addressing climate change through educational programming, research and advocacy. What began as a few extracurricular ESE events each term quickly grew into course workshops, a student club, a leadership certificate program, and a digital hub. At the same time, improvements were being made to OISE's 1960s building to align with this work, installing low flow toilets and motion sensor lights, to help conserve water and energy. In the main staircase a walking art gallery grew into a dozen environmental art installations that encourage people to walk the stairs (rather than take the elevators) to support health and well-being and energy conservation. An educational garden of native plants was added in 2013, as a way to improve biodiversity in the heart of the city. These developments initiated conversations with other groups at the university, including U of T's Sustainability Office, and attracted educational partners from across the GTA, including Evergreen, Foodshare, and most importantly, the EcoSchools Program at the Toronto District School Board.

The IPCC reports and the global climate strikes in the fall of 2019 brought a heightened urgency to entrench this work into all aspects of OISE's work and operations, recognizing that education is central to the cultural shifts needed for more sustainable forms of living. Working in conjunction with Dr. John Robinson and the CECCS, OISE began to investigate ways to address the climate crisis within the purview of its work. This resulted in its own Climate Action Summit in January 2020 to engage faculty, staff and students in consultation, and then in OISE's Sustainability & Climate Action Plan in 2021, the first of its kind for a faculty of education in Canada. With attention to what OISE does best, three of the strands of the plan home in on *Curriculum & Teaching*, *Research*, and *Community Engagement & Outreach*. Two more, *Governance & Institutional Supports*, and *Facilities & Services*, aim to ensure that sustainability and climate action become integral components of OISE's work. Many of the actions and strategies of this Plan aim to support and embed CECCS' priorities in the Institute.

As one of the largest faculties of education in North America, OISE is well-positioned to support and mobilize the education sector in addressing the UN's Sustainable Development Goals (SDGs). A Climate Action Advisory Committee has been put in place that made a Climate Emergency Declaration last April. Courses, twenty+ co-curricular events and a conference on ESE are being delivered annually for all interested in learning more about a wide range of ESE-related topics, including nature-based learning, ecojustice, and climate change education. Collaborative programs are in place with the School of the Environment, and a new Co-Curricular Designation in Sustainability is available for OISE students. OISE's Natural Curiosity project continues to support learning about environmental inquiry through an Indigenous lens, reminding us of the centrality of Indigenous knowledge in this work. And the collaboration with the TDSB EcoSchool's program continues to flourish, bringing teachers and student teachers together to enact ESE in K-12 schools. Moving forward, this work will continue to grow as part of OISE's commitment to both individual and collective wellbeing, to the SDG's and to the development of a more just, equitable and sustainable world.

Photo Credit: Hilary Inwood

New living wall on the cover is now installed in the lobby of the OISE building.

Case Study #2 - UTM's Sustainability Strategic Plan

By Beverley Ayeni, Sustainability Manager, Strategic Initiatives, Utilities & Sustainability Division, Facilities Management & Planning, UTM

UTM's Sustainability Office, with the guidance and oversight of PSAC, is leading the implementation of the Plan. The Plan will function as a living document, with PSAC re-evaluating the plan annually to ensure its continued validity and viability. An annual report will be made publicly available online noting achievements, providing status updates, and highlighting lessons learned.

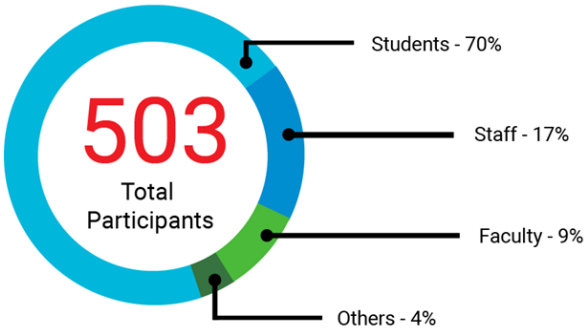
UTM's Sustainability Strategic Plan can be viewed here: Fostering a Culture of Sustainability 2030.
The University of Toronto Mississauga (UTM) recently released its first Sustainability Strategic Plan. Developed through a year-long visioning effort with the Principal's Sustainability Advisory Committee (PSAC), the Plan identifies ambitions, goals, and targets for embedding sustainability in UTM's five pillars of sustainability: academics and curriculum, research, campus engagement, civic engagement, and human resources & infrastructure. Passionate staff, faculty, and students participated in focus groups, visioning sessions, a survey, and a town hall to determine 26 goals and 102 targets for the 10-year action plan.

To assist in the creation of the Plan, UTM also relied on the Sustainability Tracking, Assessment, and Rating System (STARS). STARS is a highly-rated benchmarking tool for higher education institutions and provides a framework for understanding sustainability programs, initiatives, and practices at one's institution. UTM used STARS to systematically measure its current sustainability performance, creating a baseline for its short and long-term goals in the Plan. This comprehensive exercise earned UTM a STARS silver rating achieving a score of 60.05.

2.3 Adams Sustainability Celebration

2.3.1 2020-2021

The inaugural Adams Sustainability Celebration took place from September 2020 to January 2021. Due to the COVID-19 pandemic, the plans for a Sustainability Day shifted into an online 5-month series.



The Adams Sustainability Celebration is helping to build a community with top-of-mind sustainability awareness. Over 500 U of T community members were involved with this Celebration as participants, panellists, exhibitors, and organizers. CECCS concluded the Celebration on January 21, 2021 with a prize competition and award ceremony.

The theme for the 2020-2021 Celebration was engagement. Funding has been received by CECCS to host two additional annual celebrations in 2021 and 2022. The focus of the subsequent celebrations will be on inspiration and leadership in sustainability.

Live Panel Sessions

From October to January, there were six live panel sessions being hosted on a variety of topics. Sessions lasted between 60-90 minutes and were delivered through a custom-designed virtual portal, facilitating a social experience for attendees and a connection and natural rhythm between sessions. Attendees asked questions and shared opinions using in-built chat functionality, creating a platform for engaged community discourse on relevant sustainability topics at U of T. The six live panel sessions were:

- The SDGs Paradigm at U of T: An Exploration of SDGs Embedding in Courses and Activities

The United Nations' 17 Sustainable Development Goals (SDGs) were adopted in 2015 as a global framework to achieve prosperity for people and the planet by 2030. The SDGs reflect sustainability in a holistic manner, calling for action on abolishing poverty, achieving gender equality, and combating the climate crisis. This new decade rings in a sense of urgency for the SDGs as their progress is currently not in line with 2030.

At U of T, actors and organizations from both academic and operational sides have adopted the SDGs to pursue important sustainability work in the social, humanitarian, environmental, and economic realms. This panel, which featured champions of SDGs embedding on campus, provided an insightful and in-depth exploration of how various initiatives have advanced U of T's commitment to the world's arguably most ambitious set of goals. Pertinent topics included past and current work, such as the creation of an SDG-based course inventory, a new university ranking system according to SDGs, and the advancement of SDG design-thinking through community engagement work. The panel also delved into new initiatives, such as the ambitious "17 Tables" events that featured 17 round tables of U of T researchers according to their SDG of focus, and OISE's Climate Action Plan to reduce its carbon footprint and work towards a sustainability mindset.

Panellists:

- Kimberley Slater – PhD Candidate in the Department of Geography, Moderator
- Hilary Inwood – Lecturer and Lead, Environmental & Sustainability Education, Dept. of Curriculum, Teaching and Learning, Ontario Institute for Studies in Education (OISE), UTSG
- John Robinson – Professor, Munk School of Global Affairs & Public Policy and the School of the Environment, UTSG
- Joseph Wong – Interim Vice-President, International, Ralph and Roz Halbert Professor of Innovation at the Munk School of Global Affairs, and Professor, Department of Political Science, UTSG
- Paolo Granata – Assistant Professor, Book and Media Studies, St. Michael's College, UTSG
- Simon Pratt – Director, Policy & Analysis, Planning & Budget Office, UTSG

- Getting to Carbon Neutrality at St. George Campus

Sustainability and environmental stewardship are embedded in the fabric of our operations at U of T as we take action to meet the challenges of climate change. U of T has been working towards aggressively reducing its greenhouse gas emissions. In this session, Ron Saporta, Chief Operating Officer at U of T, and Marc Couture, Director of Energy & Sustainability reviewed U of T's sustainability goals, the Low Carbon Action Plan, and the proposed Utilities Master Plan to achieve carbon neutrality by 2050.

Panellists:

- Adriana Dossena – Project Coordinator, Sustainability Office, UTSG
- Jennifer Puskar – Project Coordinator, Sustainability Office, UTSG
- Marc Couture – Director, Sustainability Operations and Services, UTSG
- Ron Saporta – Chief Operating Officer, Property Services & Sustainability, UTSG

- Post-COVID Travel and CECCS' Business Air Travel Report

The Covid-19 pandemic has resulted in a surge of online activity and reduction, and in most cases, elimination, of air travel for business. CECCS created a three part Air Travel Report in early 2020 as the beginning of a discussion around business air travel at U of T. The three areas of focus were: quantifying business air travel, reducing air travel through virtual conferences and other means, and mitigating air travel emissions through a bespoke initiative. This session discussed the Air Travel Report that was submitted to President Gertler in Spring 2020 and spoke broadly about the changing

landscape of travel in a post-COVID landscape, including resources and support for delivering engaging virtual events.

Panellists:

- Garrett Morgan – Doctoral student, Department of Geography and Planning, Moderator
- Andrea Muehlebach – Associate Professor, Anthropology, UTM
- Eric Miller – Professor, Department of Civil and Mineral Engineering, FASE, UTSG
- Vinita Haroun – Director for the Centre for Research & Innovation Support, UTSG
- Ron Saporta – Chief Operating Officer, Property Services & Sustainability, UTSG
- John Robinson – Professor, Munk School of Global Affairs

- UTM's Sustainability Strategic Plan: Fostering a Culture of Sustainability

Sustainability is one of the five priorities of UTM's current academic plan. The Sustainability Pathways Working Group (SPWG) appointed by the Dean recommended, in September 2018, UTM should strive to become a global leader in sustainability by fostering a culture of sustainability. In Fall 2019, the Principal, UTM, constituted the Principal's Sustainability Advisory Committee (PSAC) to develop the Sustainability Strategic Plan, as recommended by the SPWG, to achieve its vision to become a global leader in sustainability.

The PSAC has passionate members of faculty, students, staff and community, and organized many focus groups, townhalls, and visioning sessions with members of the UTM to identify its ambitions, goals and targets for each of the five pillars of the plan – academic programs and curriculum, research, campus engagement, civic engagement, and human resources and infrastructure. The plan is organized around 26 goals which are aligned with the United Nations Sustainable Development Goals (UN SDGs) and the Sustainability Tracking, Assessment & Rating System (STARS 2.2) of the Association for the Advancement of Sustainability in Higher Education (AASHE).

This panel discussed sustainability being one of the priorities of UTM's academic plan, its vision of fostering a culture of sustainability, the process of developing the strategic plan, key features of the strategic plan, and steps for successful implementation.

Panellists:

- Shashi Kant – Professor, Institute for Management & Innovation, UTM, Moderator
- Amrita Danière – Professor, University of Toronto, Mississauga
- Beverley Ayeni – Sustainability Manager, Strategic Initiatives, UTM
- Saher Fazilat – Chief Administrative Officer, UTM

- Investing to Address Climate Change: In Conversation with President Gertler

Earlier this year, the University of Toronto and more than a dozen Canadian universities signed a landmark charter that aims to tackle climate change through a commitment to responsible investing practices. U of T and McGill University initiated the charter, and more than a dozen other universities have joined the effort. It calls on universities to, among other things: incorporate environmental, social and governance (ESG) factors into investment practices; regularly measure the carbon footprints of investment portfolios and set meaningful targets to reduce them over time; and engage with companies to encourage them to reduce emissions.

Joining forces with other universities to address climate change through the charter is just the latest in a series of steps taken by U of T since the release of President Gertler's 14-point plan to take action on climate change in 2016.

This session featured a discussion with President Gertler on the newly created "Investing to Address Climate Change" charter**.**

Panellists:

- Dr. Meric Gertler, President, U of T
- (Interviewer) Lisa DeMarco, Senior Partner, DeMarco Allen LLP

- UTSC's Sustainability Initiatives: 2020 and Beyond

The University of Toronto's Scarborough (UTSC) campus has a long history and commitment to issues related to the environment, as well as social equity and inclusion, and this is now at the forefront of our priorities as a campus as part of our recently released Strategic Plan.

In the spring of 2019, eight working groups of students, staff, and faculty consulted with more than 1,100 people from inside and outside our campus, reviewed extensive data and other documents, discussed and debated ideas and ultimately, presented their findings. Through this inclusive process, we made a commitment to champion sustainable livelihoods, cultures, and ecosystems of local and global relevance and resonance in a manner that gives pride of place to Indigenous initiatives and expresses our collective values of equity, diversity, inclusion and accountable stewardship.

In developing our Strategic Plan, it became evident that 'sustainability' was the focus of numerous and diverse individuals and groups across the campus. To capture this diversity, we are currently creating an inventory and map of activities, programs, research, and academic networks as a basis for all future initiatives and programs at the campus. We are building on our legacy, while looking to the future.

During this session, our panellists connected-the-dots between what is envisioned for the campus in our Strategic Plan, and what our mapping exercise has revealed, including any feedback we may receive from our community.

Panellists:

- James MacLellan – Environmental Studies Program Director, UTSC
- Jeffrey Miller – Manager, Sustainability Office, UTSC

Showcases

Throughout the five-month celebration, there were ten virtual showcases available for attendees to visit. These showcases are virtual booths showcasing different aspects of sustainability activities at U of T. They were a strong uniting force to collect U of T's many initiatives at the student, faculty, and administrative levels in one place to highlight their impact. The virtual showcases were:

- Adams Sustainability Champions Internship
- International Networks
- U of T School of the Environment
- Sustainability Inventories at U of T
- The Sustainability Lab at the Faculty of Applied Science and Engineering
- Solar Fuels Group at the University of Toronto
- UTM Sustainability Office
- UTSC Sustainability Office
- UTSG Sustainability Office
- Rotman Commerce Sustainable Business (RCSB)

Adams Sustainability Innovation Competition

The Celebration provided a total of $55,500 in grant and prize money to support sustainability initiatives at U of T. Through the Adams Sustainability Innovation prize competition, the Celebration offered $25,500 in prizes to recognize, reward, and accelerate the U of T's most innovative sustainability ideas submitted by students. This was the second time this competition ran. In the first year, the sustainability prize competition was organized by the Innovations & Partnerships Office.

The winners of the 2021 Adams Sustainability Innovation Competition were:

- 1st Place Winner ($10,000) – ALT TEX

ALT TEX

ALT TEX is a Toronto-based biomaterials startup, creating biodegradable and carbon neutral textiles re-engineered from food waste. ALT TEX's highly scalable solution offers polyester-like performance, enabling brands to offer sustainable solutions without sacrificing quality. Learn more at: https://thealttex.com/

- 2nd Place Winner ($7,500)– HOPE Pet Food

HOPE FOOD FOR GOOD

HOPE is a meat-free sustainable pet food. Their innovative formulas go beyond plants and include ingredients across the tree of life such as insects, algae, and yeast. They are guided by science and kindness to provide exceptional nutrition without breaking the planet. Learn more at: https://hopepetfood.ca/

- 3rd Place Winner ($5,000)– Polaris.AI

Polaris AI promotes a better public transit experience for everyone. It is an AI-powered engine that enables transit agencies to identify and communicate service delays efficiently, thus allowing riders to plan their trips more accurately.

Runner-up Winners ($1,000 each):

- Yayra-Si Youth Foundation

Yayra-Si Youth Foundation (YSYF)'s Banana Fiber Bags, which are manufactured almost entirely from naturally abundant banana and plantain fibers, are a sustainable alternative to plastic bags in Ghana. These products will reduce plastic waste and fatal flooding, economically empower women in rural communities, and increase public environmental health awareness. Learn more at: https://ysyf.org/

- IOBO

IOBO is building the most efficient supply network for drinking water by making bottles smarter through proprietary technology. IOBO-enabled containers provide reliable and accurate data that dramatically reduces operational costs for water companies. Learn more at: https://www.io-bo.com/

- Fyyne

Fyyne is a mobile-first platform that allows beauty artists to run their businesses more effectively and efficiently. They use their proprietary technology to connect relevant artists with customers and simplify the entire booking process from discovery to payment. Learn more at: https://www.instagram.com/fyynehq/

Adams Sustainability Student and Faculty Grants

In addition to the Innovation Prize, there were grant opportunities for students and faculty. A total of $30,000 was awarded for advancing sustainability in courses and across campus. Faculty had the opportunity to fund original ways to incorporate sustainability in their courses, and students had the opportunity to apply this grant towards making a sustainability plan between September 2020 and August 2021.

The recipients of the 2021 Adams Sustainability Student Grants were:

- SDG Student Hub at U of T

Sustainable Development Goals or SDG student hub's mission is to raise awareness and implement solutions around the UN Sustainable Development Goals. Their work is guided by three pillars: education, community, and solutions.

The SDG student hub at U of T used their grant funding to spread out educational events throughout the year that expose hub members to specific SDGs, as well as non-governmental organizations (NGOs) and companies working to implement them. They held a case competition in March that works with a local NGO, intending to implement the winning solution to a community problem that drives impact and change in the community.

They are further developing a career development program that connects students to professionals through talks and networking events. Finally, their work also includes developing the first student journal at U of T that is focused solely on sustainability.

Learn more at: https://www.facebook.com/sdgstudenthub.uoft/

- UTMSU Equity Team

UTMSU Equity Team seeks to address food insecurity on campus. They used their grant funding to develop a seed library at the UTM campus which offers community members access to free indoor-friendly seed gardening materials, rentable equipment, and educational workshops. The aim was to challenge the social stigma of food insecurity and foster motivation in our community to help support food insecure Canadians.

- Kat Dervenis

Kat Dervenis is a first year MA student in Human Geography at the University of Toronto St. George whose research interests relate to environmental justice, social movements, and food sovereignty. She has a variety of experience working in the food justice world and supports grassroots community organizing around this issue.

Kat will be using her grant funding to support urban agriculture at U of T. She proposes that container gardening can be done in students' homes, thus supporting accessibility, local food production, and mental health and wellbeing, especially in the context of COVID-19. She piloted an at-home container garden kit for students in need and individuals who are facing food insecurity. This kit included soil, seeds, an instruction document, and ways to reach out to students using listservs. At the end of the summer, when students had made progress on growing produce at home,

they had the opportunity to report on their food production experience, allowing for peer learning and ways to optimize the process in the future.

The recipients of the 2021 Adams Sustainability Faculty Grants were:

- Professor Hans Ibelings, John H. Daniels Faculty of Architecture, Landscape and Design

Professor Hans Ibelings is a professor at the John H. Daniels Faculty of Architecture, Landscape and Design. He used his funding from the Adams Sustainability Faculty Grant for research assistance to revisit conventional highlights of modern architecture post-1945. He examined these topics through the lens of sustainability and climate change in the hope that it will lead to a new understanding of how global warming is deeply connected to all building activities.

- Professor Michael Liut, Department of Mathematical and Computational Sciences at the University of Toronto Mississauga

Professor Michael Liut is an Assistant Professor in the Department of Mathematical and Computational Sciences at the University of Toronto Mississauga. He used his funding to promote sustainable thinking amongst computer science students. He will be adding sustainability concepts over several components of his database course, which aims to impact all three campuses at U of T. He will be introducing the first edition of any type of sustainability concept to the computer science curriculum and hopes that it will be the first of many to transform more in-depth thinking about sustainability in the field.

- Professor Fiona Miller, Institute of Health Policy, Management and Evaluation at the Dalla Lana School of Public Health

Professor Fiona Miller is a Professor of Health Policy and Chair of Health Management Strategies at the Institute of Health Policy, Management, and Evaluation. Alongside two PhD students in the department, Victoria Haldane and Anna Cooper Reed, Professor Miller has worked to create a course on sustainable health care.

Now, with the Adams Sustainability Faculty Grant, Professor Miller and her colleagues hope to engage with other programs within their faculty to pilot some of their learning. They hope to further co-develop materials and find opportunities to embed sustainable health systems and sustainable healthcare imperatives into curricula throughout their faculty to take the conversation forward.

2.3.2 2021-2022 Adams Sustainability Celebration

The goal for the 2021-2022 Adams Sustainability Celebration is to build on the foundation from the first year, with the possibility of having a hybrid event series. The plans for the second Adams Sustainability Celebration are underway with the majority of the offerings to be in the Winter 2022 semester.

2.4 Communications

2.4.1 Sustainability Strategy and Communication Reports

A sustainability communications strategy is being created by the U of T Communications (UTC). Feedback from the CECCS Secretariat was given in early 2021 for a draft strategy.

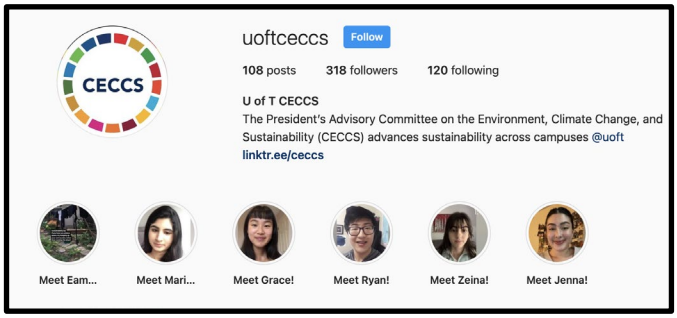
UTC has recently created a report to demonstrate how sustainability has been showcased in the media since November 2020. This report consisted of owned and earned media, social media, and communications plans. Some highlights include 71 stories published by U of T News and 61 stories successfully pitched to external media outlets. See Appendix 4 for the full communications report on environment, climate change, and sustainability created by U of T Communications.

2.4.2 Website Revamp

The President's sustainability website launched in 2019 with a portion of that website allocated for the CECCS webpages. We are undergoing a website refresh of content and structure in order for the website to be more user-friendly.

2.4.3 Social Media

Led by the CECCS student Research Assistants and Interns, CECCS has been active on Twitter and Instagram. There are plans to expand this to LinkedIn to engage more with the Committee members and past students. Facebook was utilised to promote the Adams Sustainability Celebration but has not been expanded for general CECCS content.



2.4 4 Co-Chairs Presentations

Both Co-Chairs have been spreading the work of the CECCS by giving presentations to various groups, on campus, locally, and globally, to share our experience, activities, and structure, to demonstrate our place as leaders in sustainability. See Appendix 8 for a list of these presentations.

2.5 Additional Resources

2.5.1 List of Inventories

CECCS publishes and updates the following inventories on an annual basis as a resource for anyone interested in tri-campus sustainability activities at U of T:

- Sustainability Course Inventory (See 3.1.2)
- Sustainability-Oriented Community Engaged Learning Course Inventory (See 3.1.4)
- Sustainability-Related Student Group Inventory (See 3.3.4)
- Sustainability-Related Graduate Program Inventory (See 3.2.5)
- Sustainability-Related Graduate Thesis Inventories (Masters) (See 3.2.5)
- Sustainability-Related Graduate Thesis Inventories (PhD) (See 3.2.5)
- Sustainability-Related Research Unit Inventory (See 3.2.5)

Subcommittee Activities

3. Subcommittee Activities

3.1 Teaching & Learning

The Teaching & Learning Subcommittee has inherited the mandate of the former Curriculum Innovation Subcommittee which was to support the development of sustainability curriculum pathways for every undergraduate student. It also provides guidance on instilling sustainability in community-engaged learning initiatives and student workshops. The Subcommittee is chaired by Professor Liat Margolis, Associate Dean, Research, and Director, Green Roof Innovation Testing Laboratory, Faculty of Architecture, Landscape, and Design.

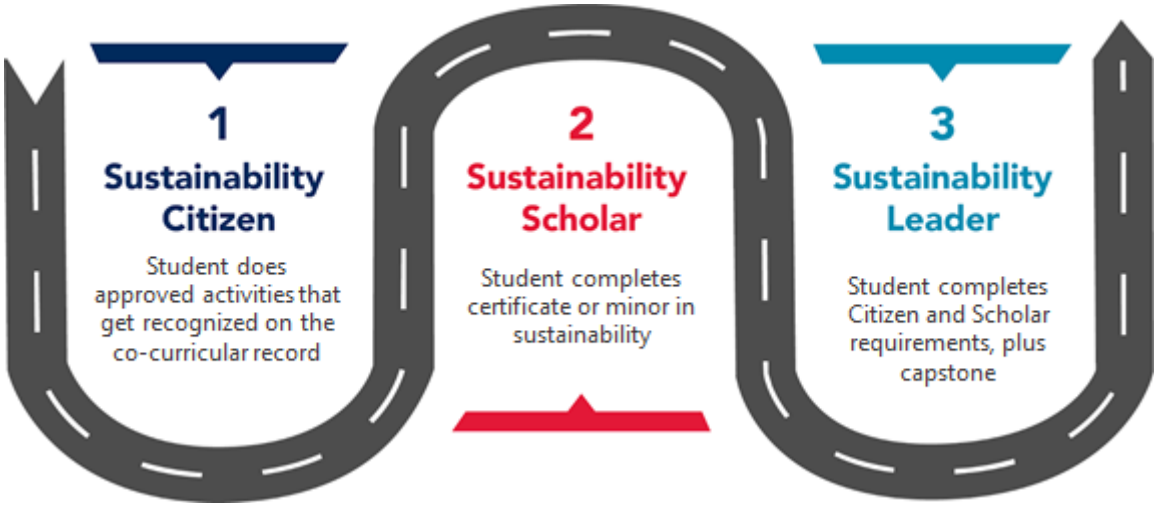
3.1.1 Sustainability Pathways Program

U of T Sustainability Pathways are clusters of courses and co-curricular activities with a common theme of sustainability that allow students to explore sustainability from various disciplinary, methodological, and practical perspectives. We aim to develop and offer these curricular and co-curricular pathways to all undergraduate students to provide each student with the opportunity to incorporate sustainability learning into their program, regardless of the degree program they are in, and to develop cross-cutting interdisciplinary skills.

With the sustainability curricular pathways at its core, U of T has developed a three-tiered Sustainability U Framework:

> **Sustainability Citizen** – Student completes a certain number of approved sustainability-oriented co-curricular activities
>
> **Sustainability Scholar** – Student completes a Certificate or Minor in sustainability
>
> **Sustainability Leader** – Student completes Citizen and Scholar requirements, and adds an experiential learning capstone activity

The Framework is to encourage students to incorporate sustainability learning in their curricular and extracurricular activities on a voluntary basis. Recognitions are made on their transcripts (for Sustainability Scholar), Co-Curricular Record (for Sustainability Citizen), or both (Sustainability Leader).



Sustainability Scholar

The Sustainability Scholar program has been underway across five divisions led by current or former CECCS members:

- Daniels Faculty of Architecture, Landscape and Design - under the leadership of Professor Liat Margolis, CECCS member and Associate Dean, Research, the Certificate in Sustainability of the Built Environment as part of U of T's new Sustainability Scholar (aka Curricular Pathways) program launched in September 2020 and now led by Petros Babasikas, Director of the Bachelor of Arts in Architectural Studies.
- Faculty of Applied Science & Engineering - Professor Bryan Karney, former CECCS member and Associate Dean, Cross-Disciplinary Programs, led the redesignation of two Minor programs - Sustainable Energy Minor and Environmental Engineering Minor - as their Sustainability Scholar programs, effective September 2020.
- Faculty of Arts & Science (FAS) - the new Certificate in Sustainability is housed at the School of the Environment and open to all FAS undergraduate students as of September 2021. The School has created a new teaching stream faculty position associated with the Certificate, and appointed Professor Michael Classens into this position as program coordinator.
- University of Toronto Scarborough - their Certificate in Sustainability program has been approved for launch in September 2021. The program development was spearheaded by Professor Jim MacLellan, former CECCS member. The certificate is administered by the Department of Physical & Environmental Sciences. See Case Study #3 below for more context of its development.
- University of Toronto Mississauga is developing a Certificate program to launch in 2022.

The curriculum guiding principles that have proven effective across the five divisions are: voluntary participation; wide accessibility; and rewarding various levels of engagement.

We expect to expand the Sustainability Scholar program to other divisions and graduate students.

Sustainability Citizen

The Sustainability Citizen Program allows students to receive official recognition for their sustainability related extracurricular activities. The Program is being run in partnership with the Sustainability Offices at UTSG, UTM, UTSC - who will validate the activities of students from their respective campuses - and is scheduled for a tentative launch in 2022. As part of the Program, students must complete an “Introduction to Sustainability” module as well as a reflection module. The rest of the Program will consist of a list of activities offered by different student groups and departments at U of T, which are broken up into various categories. Students can choose between activities to customize the experience as they wish, as long as they complete the number of required activities for each category. The Program will be facilitated on CLNx, an online platform most students are familiar with, which will allow us to link the Program to other department calendars.

Sustainability Leader

Once the first two tiers are in place, we plan to develop the third tier, the Sustainability Leader program, which will give recognition to the students who complete the Scholar and Citizen Programs plus an added capstone or event development experience.

Case Study #3 - UTSC Sustainability Certificate

Provided by: Professor James MacLellan, Department of Physical & Environmental Sciences, UTSC

As part of a suite of ongoing CECCS inspired initiatives at Scarborough Campus, we are pleased to announce our new Sustainability Certificate. Learning outcomes build awareness of, and skill development associated with, global\local sustainability challenges and their explanatory socio-economic and scientific framings within an action-oriented framing. Students without an environmental component within their degree programs now have access to a flexible, recognized, and educational designation that is consistent with professional trends in the workplace. By exposing this broader, diverse range of students to 'sustainability', the collective awareness of students, and by extension the campus, is elevated.

The Certificate represents a major step forward in environmental programming at the Scarborough Campus, but it also supports the broader goals of mainstreaming sustainability as outlined in the UTSC Strategic Plan. In a reflexive twist, the Offices of the Dean, the Registrar, and the Chief Administrator turned the Certificate planning process into an opportunity to further develop\extend the campus's analytical capabilities. Using various analytical tools, our team sought to provide a platform for the analysis\monitoring of the Sustainability Certificate.

Novel techniques essentially track how courses have historically been utilized to obtain degrees. Through this process, our team was able to show how individual courses cascade up through the campus ecosystem towards specific degree programs and departments. This not only facilitates program forecasting and monitoring but helps identify the core campus competencies associated with the concept of sustainability. When merged with an analysis of UTSC research patterns, we have been able to directly inform event planning on campus, as is evident in the successful UTSC "17 Rooms" event held on October 27th, 2021, which was attended by over 100 participants.

Case Study #4 - School of the Environment: new institutional status, research clusters, and Masters' degree

By Professor Steve Easterbrook, Director, School of the Environment

The School of the Environment was approved for a major change in status by the University of Toronto Governing Council from July 1, 2021, which now allows the School to hire its own faculty members. Additionally, it will give the School more autonomy as it grows. In the past, the School was only able to hire tenure-stream faculty by partnering with other departments, with the School holding a maximum of 49% of each professor's position.

This status change will enable the School to develop as an international leader in interdisciplinary environmental research and teaching, and to address the growing urgency of global environmental crises and the demand from our students that Universities play a leadership role in responding to these crises. In the coming year, the School will advertise for the first two of these new faculty positions, in the areas of Communicating Climate Change and the Sustainability Transition.

The School now has a new mandate to develop and lead new trans-disciplinary research initiatives with a new research strategy built around three research clusters: (1) Interpreting Global Environmental Change, which will bring together scientific, social, and cultural understandings of the climate change crisis and our responses to it; (2) Planetary Health, which will develop an interdisciplinary and holistic understanding of the relationships between a healthy environment, healthy ecosystems, and a healthy human population; and (3) The Technology-Society Nexus, which will study how our changing relationship with technology and infrastructure can be both the source of environmental problems and a source of innovation for sustainability solutions.

These two changes also coincide with the launch of the School's new Master of Environment and Sustainability, which will be accepting its first cohort of students in 2022, and the School's new Certificate in Sustainability, which is open to all undergraduate students in the Faculty of Arts & Science

Case Study #5 - ENV461 and Trinity One Inspiration

By Professor Stephen Scharper, Director of Sustainability, Trinity College

Noah Foster was a student in the first offering of the TRN 140Y and TRN 141Y in the 2018 & 2019 academic year, which continue to be taught by Profs. Stephen Bede Scharper and Nicole Spiegelaar, who now serve as Director and Associate Director, respectively, of the Trinity College's Integrated Sustainability Initiative. These two first-year courses constitute The Butterfield Environment & Sustainability stream, created in close consultation with the University of Toronto's School of the Environment, and which adopts a deeply interdisciplinary approach involving the arts, sciences, social sciences as well as practical experiential opportunities.

Trinity's Integrated Sustainability Initiative, made possible through the generous support of Joannah and Brian Lawson, and the Butterfield Environment & Sustainability stream, created through the generous support of George and Martha Butterfield, are concerned with not only information but also *formation* and *transformation*.

The hope of these initiatives is to assist students to not only become well-grounded in sundry precepts and parameters of sustainability, but also to be "calmly on fire" about sustainability, and to become empowered, centered, and compelling sustainability advocates.

In light of Noah Foster's trajectory, it seems some of these hopes are being realized.

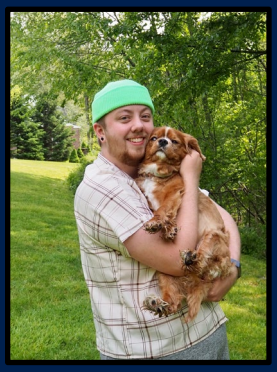


Photo Credit: Noah Foster

By Noah Foster, 4th-year student in the Environmental Studies, Women & Gender Studies, and Indigenous Studies, Trinity College

In my first year of university, I was part of the Butterfield and Environment and Sustainability Stream program taught by Professor Stephen Scharper and Professor Nicole Spiegelaar within the Margaret MacMillan Trinity One Program. During one of Professor Scharper's classes, we paid a visit to the ENV461 UofT as a Living Lab class taught Professor Robinson and heard a lecture on regenerative sustainability. This lecture sparked an interest in me, and it made me excited for what was to come in the next four years of my education. From that point onward, I knew I wanted to be a part of Professor Robinson's class once I reached my fourth year of university. Now, three years later, I am, in fact, a student in the ENV461 class working to distribute a survey assessing student, staff, and faculty sustainability literacy and behavior. It felt like a surreal moment as I watched Professor Scharper zoom into our lecture with his new Trinity One students, remembering when I had been one of them. I sat now, three years older, in the place of the students I longed to be, doing work that felt far beyond my abilities as a first year.
This was an incredible opportunity to reflect on my time in university and environmental studies to see how much I've grown. Despite the tribulations of university, I managed to find my way back to Professor Robinson's class and become one of the students I looked up to during my first year. Such a full-circle moment is so special, and I wanted to share this with other students who are just discovering the studies they are passionate about.

Case Study #6 - UTM: Certificate of Completion in Global Sustainability

By Professor Shashi Kant, Master of Science in Sustainability Management Program Director, Institute for Management and Innovation
and Diana Aldaz, Sustainability Projects & Engagement Coordinator, Master of Science in Sustainability Management Program, Institute for Management & Innovation

In September 2021, the Institute for Management & Innovation (IMI), UTM started the Certificate of Completion in Global Sustainability. The Certificate will make global sustainability education accessible to all undergraduate students at UTM, regardless of their degree program, and at no additional cost to students. Students who are not completing an environmental or natural resources program will gain foundational knowledge and skills in global sustainability, while students currently in sustainability-minded programs will find that the certificate complements their academic work by enhancing critical, integrative, and systems thinking to address global sustainability issues. The certificate is an optional not-for-credit offering that is awarded solely based on successful completion of six (three required and three elective) modules in global sustainability offered by IMI. The Certificate of Completion will be available to any currently enrolled UTM undergraduate student who has completed a minimum 4.0 credits.

Each module will be approximately 10 hours in length and include a set of workshops, group discussions, analyses of real-life sustainability problems/issues, and exploration of diverse approaches to potential solutions. Successful completion of a module will require attendance and active participation in all 10 hours of the module. UTM students can register to these modules through the UTM Certificate of Completion in Global Sustainability Quercus shell, which is available to all actively registered UTM undergraduate students who have completed 4.0 credits. In Winter 2022, sessions will be conducted via Zoom and module materials will be shared via Quercus. Upon completion of Certificate of Completion requirements, students will apply to IMI for their Certificate of Completion. The Director of IMI will issue a Certificate of Completion in Global Sustainability once the requirements have been verified.

Registration is now open to all UTM students and the first module will commence on January 18, 2022. For the pilot year, the modules that are currently being offered are Sustainable Consumption, Systems Thinking and Global Sustainability, Waste Management Systems, Sustainable Food Systems, and Inter-disciplinary Perspectives on Global Sustainability.

For more information on the Certificate of Completion please visit: https://uoft.me/global-sustainability

CERTIFICATE OF COMPLETION IN
GLOBAL SUSTAINABILITY

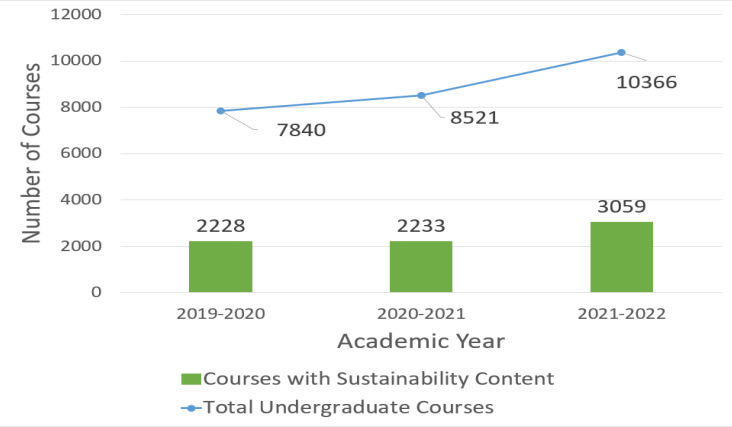
3.1.2 Sustainability Undergraduate Course Inventory

True to the adage "What gets measured gets managed," the first step the CECCS took when it was founded in 2017 was to take a full inventory of undergraduate courses with sustainability components in order to understand the landscape of sustainability education at U of T and make this information available to students and instructors. Taking stock of current courses with sustainability content was a crucial step in demonstrating how much sustainability activity is currently ongoing, providing a basis for future research and teaching, and developing a community of practice.

A search was performed using SDG-related keywords (See Appendix 5) in the course titles and descriptions from the list provided by the Provost's Office and supplemented by the Course Finder administration.

The search results were then manually reviewed for quality assurance by the CECCS. This catalogue was then made public to create pathways for students interested in studying sustainability, culminating in the Sustainability Pathways Program (also known as the Sustainability U Framework) detailed in 3.1.1.

Chart X shows a growing trend both in the total number of undergraduate courses offered and the number of courses with sustainability content, since the CECCS started tracking these courses. The 2021 Sustainability Course Inventory, published on the U of T Sustainability website, showed 3,059 (or 29.5%) courses with sustainability orientation out of 10,366 courses offered. The breakdown by division is as follows.



University Divisions	Unique Sustainability Courses	% of Total Courses	% of Undergraduate Students	Number of Sustainability Courses per Student (Divisional)
ARTSCI- UTSG	1433	47	39	0.056
USTC	675	22	18	0.058
UTM	640	21	20	0.049
APSE	152	5	8	0.030
FALD	35	1	1	0.036
KPE	49	2	2	0.050
MUSIC	26	1	1	0.046
INFO	6	0	0	0.15
PHARM	43	1	2	0.042
Total	**3059**	**100**	**91***	**0.047**

*The following divisions were not included in the table as they had no courses in the inventory: Dentistry, Law, Medicine, Nursing, OISE, Woodsworth Certificate, Transitional Year Program

The breakdown by SDG is as follows.

SDG Group	Number of Courses	% of Total Courses
1. No Poverty	89	3
2. Zero Hunger	166	5
3. Good Health and Well-Being	488	16
4. Quality Education	220	7
5. Gender Equality	764	25
6. Clean Water and Sanitation	87	3
7. Affordable and Clean Energy	103	3
8. Decent Work and Economic Growth	265	9
9. Industry, Innovation, and Infrastructure	412	13
10. Reduced Inequalities	265	9
11. Sustainable Cities and Communities	368	12
12. Responsible Consumption and Production	250	8
13. Climate Action	592	19
14. Life Below Water	195	6
15. Life on Land	298	10
16. Peace, Justice, and Strong Institutions	650	21

3.1.3 Community-Engaged Learning Work

University as Agent of Change and Student Leadership are two of the cross-cutting themes of the CECCS and are evident in the Committee's support of the University community to work more actively with private, public, and civil society sector partners on sustainability issues, with a particular focus on student engagement. The CECCS has continued its focused efforts on increasing sustainability in community-engaged learning (CEL) courses at the University. Students learn their part or position in the world through applied projects in these CEL courses. As sustainability is thought to be an ethos or a way to think and be in the world, CEL is a way to build these mature thinkers.

In May 2019, the CECCS jointly hosted a Sustainability CEL Workshop with the Centre for Community Partnerships (CCP). The active discussion topics included the importance of moving away from the notion of sending 'expert students' and into adopting a co-production of knowledge mode, attempting to leverage student learning and integrate it into the community.

In March 2021, a follow-up workshop was held as part of CCP's CEL Instructors Community of Practice Gathering series. The participants again discussed the value of CEL experience and delved into the discussion on CEL course design and building an interdisciplinary and participatory community of practice that shares knowledge and learnings.

CECCS continues to work with CCP to further build a community of practice in this area.

3.1.4 CEL Course Inventory

The CEL Course Inventory is created from the Sustainability Course Inventory by running the following CEL keywords in the course titles and descriptions in the SDG-based Course Inventory.

*placement, *community, *experiential, *internship, *partner, *client, *service, *capstone, *office, and *professional

The 2021 CEL Course Inventory includes 93 sustainability oriented CEL courses. The purpose of this inventory is to increase the visibility of sustainability courses that foster community engagement and partnerships.

3.1.5 Campus As a Living Lab and Community Engaged Learning Project Database

The SDG-based Campus as a Living Lab (CLL) and CEL Project Database currently showcases 207 on and off campus student projects at U of T. As there have been many CLL and CEL projects over the years, this is not an exhaustive list. Project reports can be downloaded to allow new work to build on previous projects. The challenge for CLL initiatives has been focused on how to unearth and compile records that are kept mostly at a departmental level.

3.1.6 Campus as a Living Lab for Sustainability Courses

The Campus as a Living Lab course (ENV461 and ENV1103 - The U of T Campus as a Living Lab for Sustainability), offered through the School of the Environment in the Faculty of Arts and Science, embodies the CLL principles and offers students the opportunity to undertake group projects on real-world sustainability topics that are proposed by operational and academic staff at U of T. This year the Campus as a Living Lab for Sustainability Course was split into undergraduate and graduate courses in advance of the new Masters of Environment and Sustainability. John Robinson is teaching the undergraduate course, and Alstan Jakubiec is teaching the graduate course. The projects for 2021 are below.

ENV 461

- Sustainability literacy and attitudes survey for STARS at UTSG
- Transportation/mobility survey for STARS
- Scope 3 quantification
- SDG KPIs in the built environment
- Sustainability Policy for Food Services at St. George campus
- CaGBC Net Zero vs. TGS v4 (2022) comparative analysis

ENV 1103

- UTM - A meta-biodiversity plan studying existing plans and the challenges UTM faces
- UTSC - Carbon sequestration accounting for landscape management / design and invasive species management

3.2 Research

The former structure of three subcommittees did not have a sustainability research support function. In order to address the gap, the Research Subcommittee has been added to the new structure as the fourth Subcommittee of the CECCS. It aims to support and bring together sustainability researchers into a community of practice and enhance relevant research initiatives. The Research Subcommittee Chair is Professor Fiona Miller, Chair in Health Management Strategies, Institute of Health Policy, Management and Evaluation, Dalla Lana School of Public Health.

3.2.1 Urban Climate Action Network (UCAN)

The Urban Climate Action Network (UCAN) is an initiative within the University Climate Change Coalition (UC3), a coalition of 23 research intensive universities in North America. UCAN is committed to climate action and cross-sector collaboration by creating university-city collaboratives aimed at helping cities achieve their already existing climate targets. As of now, six UC3 universities

have agreed to join UCAN: U of T, UBC, U Arizona, U Michigan, Rutgers U, and Drexel U.

To create the U of T node of UCAN, Professor John Robinson, Co-Chair of the CECCS, has started discussions with the Environment and Energy Division of the City (the co-managers, with The Atmospheric Fund of Toronto (TAF), of the City climate plan) about a formal partnership between U of T and the City, which will include a strong focus on living lab activities.

3.2.2 SDGs @ U of T Event

The SDGs @ U of T event, held in early December 2020, was a precursor to the SDG ISI. It saw more than 120 participants assigned to one of 17 virtual "rooms" and another 100 participants to one of six cross-cutting themes "rooms," where they were invited to generate ideas on how to advance the SDGs at the university and beyond. The U of T event was inspired by the 17 Rooms Initiative launched by the Brookings Institution and the Rockefeller Foundation to facilitate innovative ideas from various sectors for advancing the SDGs. President Gertler acknowledged the participants in his video message, "The Sustainable Development Goals are not only a set of commitments, but a powerful framework that explicitly acknowledges the interrelationship between all 17 goals." One of the common recurring themes of discussion emphasized that collaboration is already happening, but interconnectedness between different disciplines, divisions, and communities is necessary, which U of T as an anchor institution has to lead and undertake.

See Appendix 7 for the report of the event.

3.2.3 SDG Institutional Strategic Initiative (ISI)

Institutional Strategic Initiatives (ISIs) are cross-divisional, interdisciplinary research networks supported by the Office of the Vice-President, Research & Innovation. As a result of the SDGs @ U of T event that the CECCS co-hosted in December 2020, an SDG focused ISI was launched to build on existing research initiatives, form new interdisciplinary and global partnerships, and produce a map for advancing the SDGs at U of T. Professor Robinson sits on the Steering Committee that will define the formal vision of the interdisciplinary research and education network to advance the SDGs at U of T, develop relationships and secure broad support (including funding) from external partners and all three U of T campuses, and develop and submit a proposal by April 2022 for an ISI award to fund the initiative on a longer term.

3.2.4 Transdisciplinary Co-Production Workshops

We will work with the Centre for Research & Innovation Support (CRIS) and the Centre for Community Partnerships (CCP) to design a training workshop series for early-career faculty members, postdoctoral fellows, and PhD students on community engaged research - how to conduct transdisciplinary research based on reciprocal relationships with non-academic partners. CRIS and CCP are best positioned to support junior researchers in leveraging community engagement for transdisciplinary research and facilitating better knowledge co-production. Consequently, CECCS will be exploring a complementary and 'enabling' role to instil sustainability in their workshop design.

3.2.5 Adams Champions Internship

Made possible by a generous donation from our donor Wendy Adams, the Adams Sustainability Champions Internship gave undergraduate students the opportunity to conduct research work in sustainability topics relating to post-secondary education. Our 2019 cohort of interns helped the CECCS create a comparative framework to look at sustainability governance and activities to evaluate sustainability integration at various universities around the world. They examined the domains of teaching and curriculum, research, operations, and community engagement. In the summer of 2019, two students were able to travel to Utrecht University in the Netherlands and the University of Edinburgh in Scotland for this work. (See Appendix 9 for "A CECCS White Paper")

Due to COVID-19, international in-person visits were not possible in 2020, but the Adams Sustainability Summer interns continued their work remotely. In Summer 2020, seven interns joined our internship program to look at eight additional universities: University of Toronto and University of British Columbia in Canada, Arizona State and MIT in the United-States, University of São Paulo in Brazil, University of Cape Town in South Africa, University of Hong Kong, and Monash University in Australia.

The 2021 cohort is synthesizing the work of the interns into a journal paper focusing on sustainability governance issues across the 10 universities with suggestions on what might be fruitfully adopted to achieve transformative institutional change on sustainability issues at U of T and beyond.

See Appendix 6 for the draft 10-university comparison paper. It will be circulated to colleagues at the other nine universities for their comments and inclusion as authors before being submitted to a journal.

3.2.6 Research-Related Resources

Graduate Program Inventory

The Graduate Programs Inventory gathers information about graduate and PhD programs offered by U of T which have sustainability-related content or focus. The inventory contains programs identified from the comprehensive professional graduate programs list on the School of Graduate Studies website and has been prepared by conducting a keyword search based on the SDGs in the program titles and descriptions. The 2021 Graduate Programs inventory includes 119 of a total of 171 programs/areas of study (70%). For degree and diploma programs (including dual degree), 94 of 131 programs (72%) had sustainability-related content. For collaborative specialization programs, 25 of 40 programs (63%) had sustainability related content. The search results were manually reviewed for accuracy with some limitations due to the lack of detailed program descriptions on the source website. This search did not look at combined degree programs.

Graduate Theses Inventories (Master's & PhD)

The Sustainability Graduate Thesis Inventories gather information about all Master's and Doctoral theses with sustainability content at U of T since 2009. The Master's Thesis Inventory includes 1,797 sustainability-oriented theses, representing approximately 22% of 8,260 Master's theses since 2009. The Doctoral Thesis Inventory includes 1,921 sustainability-oriented theses, representing approximately 20% of 9,627 doctoral theses. These inventories serve to increase the visibility and accessibility of sustainability-related scholarly work at the U of t community.

The SDG-related keywords, also used to update the Sustainability Undergraduate Course Inventory, were searched in the titles and abstracts of theses. Since 2009, the School of Graduate Studies (SGS) requires Doctoral and Masters graduates to submit a thesis to TSpace, a free research repository hosted by the U of T Libraries to disseminate and preserve the scholarly record of U of T faculty and graduate student research. Thesis metadata was exported by a TSpace administrator and shared with the CECCS. The search results were then manually reviewed for quality assurance by the CECCS. Any output deemed irrelevant to the particular SDG based on the abstract has been removed. The following information was documented in the inventory: Author, Advisor/Supervisor, Title, Department, Date Issued, Abstract, Degree, Subject and the SDG(s) to which the thesis is related.

Sustainability Research Unit Inventory

The Sustainability Research Unit Inventory is designed to categorize U of T's research activity by mapping its research centres/institutes ("research units") to the relevant SDGs by keyword, and serve as a tool which researchers at or outside of U of T may access if they are looking to collaborate with other research units or affiliated researchers across disciplines on multi-, inter- and/or transdisciplinary projects. The inventory also serves to increase the visibility of such research units, making it more accessible for faculty, students, and researchers to add sustainability content to their work. Not including academic departments, Extra-Departmental Unit (EDU):A's and EDU:B's[1], the

[1] EDU: A is a multidisciplinary, multi-divisional or multi-departmental unit designed to foster research and teaching in a well-established and well-defined area of academic study and scholarship • May hold primary academic appointments (e.g.majority budgetary appointments of 51% or more) • Offers degree programs

inventory includes 133 sustainability-oriented research units, representing approximately 86% of all 154 Academic Units at U of T as of August 2021.

The source file is the full list of Academic Units (Departments & EDUs) maintained by and made available on the website of the Office of the Vice-Provost, Academic Programs. The CECCS team identified the website of each research unit and looked for sections in the website labelled "About," "Research," or "Research Highlights." An SDG-keyword search was conducted on the page(s) that gave a comprehensive idea of the contributions/aspirations of the research unit. A manual review was conducted on all keyword matches for direct relevance of the SDG with which the keyword is associated. The inventory includes the unit names, affiliated academic units, other units involved, websites searched, and the associated SDGs.

3.3 Operations

The Operations Subcommittee combines most of the former Campus as a Living Lab Subcommittee mandate and that of the Tri-Campus Sustainability Board. The Tri-Campus Sustainability Board was a committee created in 2007 to bring together those working on operational sustainability. As its mandate now overlaps strongly with that of the newly created Operations Subcommittee, it was decided to fold the Tri-Campus Sustainability Board into the Operations Subcommittee by inviting some of the key members of the Board to the Subcommittee. The Operations Subcommittee brings together students, faculty members, staff, and external partners as applicable, to collaborate on sustainability projects with operational and academic activities. It also works on staff training initiatives and tri-campus operational collaboration and coordination. As this is a new subcommittee with CECCS there aren't many completed initiatives to mention, but there are plans. The Operations Subcommittee Chair is Marc Couture, Director, Sustainability and Energy Management at UTSG.

3.3.1 Student Agent of Change Workshop

The purpose of these workshop/s are to provide very applied training to equip students with the skills, tools, and knowledge to become an effective Agent of Change for sustainability in their place of employment after graduation. A literature review to inform our efforts in creating these workshops is in progress, and we recognize the opportunities to integrate this workshop into either or both of the Adams Sustainability Celebration and the Sustainability Citizen program.

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where the number and research strength of faculty is appropriate • May administer research funds • The Director is appointed under the University's Policy on Appointment of Academic Administrators
EDU: B is a multidisciplinary, multi-divisional or multi-departmental unit designed to foster research and teaching in a new or highly specialized area of academic study and scholarship • May not hold primary academic appointments (e.g. can only make minority budgetary appointments of 49% or less) • Offers degree programs where the number and research strength of faculty is appropriate • May administer research funds • The Director is appointed under the University's Policy on Appointment of Academic Administrators
Source: U of T Guidelines for Extra-Departmental Units

3.3.2 Staff Workshops around SDGs

We are working with the Equity, Diversity & Inclusion portfolio within the Office of the VP, People Strategy, Equity, and Culture to create an SDG workshop for staff and faculty. We are also looking at the current professional development courses in the various departments that offer staff/faculty workshops to add the relevant SDG(s) to each course to increase awareness and incorporate SDG(s) into their respective workplace.

3.3.3 Aligning efforts on a Tri-campus Level

Currently the sustainability operations at U of T is being undertaken on a campus level, without much collaboration and coordination with each other. One of the objectives of the Operations subcommittee will be to gain tri-campus alignment on sustainability operations, starting with the following three initiatives.

A successful example of a tri-campus commitment is the new energy modelling and utility performance standard released in July 2020. This standard ensures we perform well beyond others such as the Toronto Green Standard (TGS), through advanced energy, carbon, wellbeing, and sustainability performance, and sets performance targets for both new construction as well as major retrofits.

Climate Positive Plan

The St. George campus released their Climate Positive Plan this fall (see case study #7 below). The Plan represents a major step forward for carbon mitigation on the St George campus. It showcases the path to climate positive, or negative emissions, by the year 2050. A key component of this plan is the St. George Campus Carbon and Energy Master Plan, which describes how U of T will design and build the utility infrastructure to significantly reduce the operating carbon footprint – a critical first step on the path to becoming a climate positive campus by 2050. This plan is currently only for the St. George campus, but discussions are ongoing about alignment with the management plans of the other two campuses.

Scope 3 Emissions

While Scope 1 and 2 emissions (greenhouse gas emissions from direct sources) are directly addressed at U of T, scope 3 emissions (emissions from indirect sources) are not as well catalogued[2]. The first step in working on our Scope 3 emissions will be coming up with a tri-campus definition for what we will include in our operational definition of Scope 3 emissions, and then create a tri-campus plan for how to measure these emissions. A campus as a living lab project is working on this in the Fall semester.

Key Performance Indicators (KPIs)

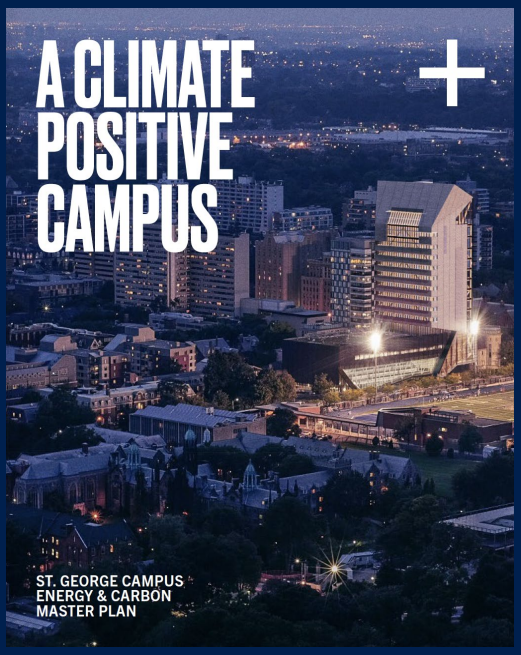
As part of the efforts to align the operations of the three campuses on operational sustainability, the three Sustainability Offices will be looking into the Association for Advancement in Sustainability in

[2] A Business Air Travel report was created in a CLL course in 2020 where emissions from business air travel were estimated.

Higher Education (AASHE) Sustainability Tracking, Assessment & Rating System (STARS) in two 'campus as a living lab' projects this Fall. One project will be on surveying the university community on sustainability literacy and culture, and the other project will be on transportation and mobility. UTM has already completed STARS and received STARS Silver rating in 2021. The Times Higher Ed (THE) Impact Rankings could also be a metric used to align the three campuses on operations. More work will be done to see what possible alignments there are on this front.

Case Study #7 - Climate Positive Plan

By Marc Couture, Director - Sustainability & Energy Management, UTSG



In recognition that climate change remains one of the most pressing challenges of our time, the University of Toronto St. George campus has committed to becoming climate positive (net negative emissions) by 2050. Our downtown Toronto campus—U of T's largest and oldest campus—makes up over 80% of the University of Toronto's operational carbon footprint. Our impact on the institutional footprint and our key role in the urban community calls for going beyond net zero carbon emissions to become climate positive by 2050. This means not only reducing the operating emissions under our control, but also mitigating additional carbon emissions to go beyond carbon neutral.

Our first step towards becoming climate positive is to invest in transformational infrastructure renewal as part of our 30-year carbon and energy campus master plan. We're moving towards renewed, resilient and reliable utility infrastructure that will enable our campus to operate and thrive without disruption and mitigate the impacts of growth of our carbon footprint. Our 2050 plan follows the release of U of T's tri-campus Low-Carbon Action Plan (2019-2024), which focuses on U of T's 2030 reduction target, and will position the institution to accelerate carbon reductions towards 2050.
View the plan: https://climatepositive.utoronto.ca/

Case Study #8 - Campus as a Living Lab for Sustainability at UTSC

By Patricia Escobar, Sustainability Manager, Sustainability Office, UTSC

During the Fall 2021 semester, students from Alstan Jakubiec's ENV1103 Campus as a Living Lab course gathered for a tour of the University of Toronto Scarborough (UTSC) Campus. The UTSC Sustainability Office is one of the course's clients and has presented the students with a complex, real-world topic to research. The students have been asked to explore the opportunities to optimize carbon sequestration from existing and new planned green spaces while considering the hindrances of managing invasive species that are a significant challenge to control. Leading the students on their tour was UTSC Grounds Operations Supervisor, Mark Nielson, Menilek Beyene, a PhD student at UTSC's Cadotte Urban Biodiversity & Ecosystem Services (CUBES) Lab, and Patricia Escobar, the UTSC Sustainability Manager.

Using the campus as a classroom, Mark showed the students example specimens of different invasive species on campus, explaining their impacts and how they are practically managed. While walking through the UTSC Valley Land Trail, Mark and Menilek continued to point out different plant species and Menilek spoke to his knowledge on forest systems and carbon sequestration from trees and other plant species.

Real world problems are complicated and solving them usually requires interdisciplinary collaboration. The research and findings from this course deliverable will provide the Sustainability Office with helpful information that may be used in future decision making or operations activities.

Through the UTSC Sustainability Office's participation in the Campus as a Living Labs course, valuable connections are being formed with U of T staff, faculty and students tackling similar problems. Most importantly, it is a fulfilling experience to work with students on realistic problems that contribute to an engaging experiential learning environment.

More questions or feedback on sustainability on campus at UTSC, please contact the UTSC Sustainability Office at sustainability.utsc@utoronto.ca.

Students from ENV1103 are pictured walking with Alstan Jakubiec, Mark Nielson, UTSC Grounds Operations Supervisor, and PhD student, Menilek Beyene, on the UTSC Valley Land Trail. *Photo Credit: Patricia Escobar*

Case Study #9 - Supply chain diversification: Introducing social procurement at U of T

By Renata Faverin, Director, Procurement Services and Lisa Myre, Senior Project Lead

Social procurement is about providing equal opportunities to diverse suppliers by building an inclusive supply chain to help suppliers from under-represented, equity-deserving communities prosper.

The goal is to advance equal procurement opportunities to businesses owned by Black, Indigenous people, LGBTQ, people of colour, women, people with disabilities, youth, seniors and new Canadians, among others.

By leveraging institutional purchasing power in support of this social imperative, significant benefits can be achieved:

- Foster an inclusive economy, reduce poverty and create employment opportunities that enrich the community.
- Expand the supplier pool, provide greater variety of products and services, stimulate innovation, encourage competition and enhance internal value.
- Stimulate the local economy by reducing poverty and maximize the return on investment through taxpayers' dollars.
- Contribute to United Nations Sustainable Development Goals 1, 3, 8, 11.

High level implementation plan

In 2018, the province of Ontario provided funding to the MaRS Discovery District to investigate barriers to implementing a social procurement program within the higher education sector. We worked with MaRS and Ryerson University to create the Buying with Impact: Social Enterprise Procurement Playbook, and adopted the MaRS framework to implement applicable recommendations in a phased approach to:

- Suit the institutional operating model where procurement decision-making is decentralized to faculties, divisions and departments.
- Leverage available resources and budget.
- Gauge U of T community uptake, monitor and evaluate.

The following steps have been completed to identify suitable suppliers and making these available to our internal buyers:

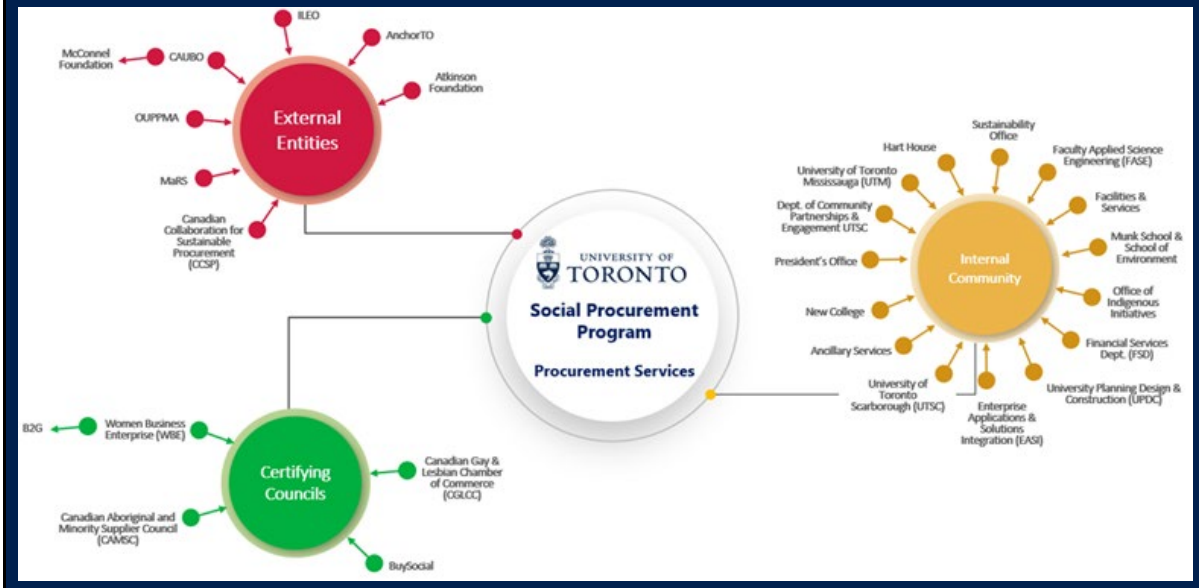
- Created a project team from procurement offices across our three campuses.
- Identified multi-stakeholder advisory board.
- Partnered with two of the major supplier certification councils – Women Business Enterprises (WBE) Canada (click here for recent WBE media release about our partnership), and the Canadian Aboriginal and Minority Supplier Council (CAMSC) to access their list of certified diverse suppliers.
- Leveraged WBE supplier portal technology to create the U of T Diverse Supplier Registration Portal.
- Identified pilot users (Facilities and Services, Faculty of Applied Science and Engineering, and Hart House) to test the tool and solicit quotes from eligible diverse suppliers.

The pillars of the MaRS social procurement framework that have informed the U of T Social Procurement Framework involve:

- Changing the narrative by changing the way procurement is perceived.
- Changing the network by broadening the range of suppliers who provide goods and services to the university.
- Changing the system by structuring procurement processes, procedures and templates that enable participation by diverse suppliers.

Although not formally announced, the U of T social procurement program has generated both internal and external interest and our network continues to grow.

Social Procurement Network….and Growing!



For more information on the Social Procurement Program, contact Renata Faverin or Lisa Myre.

Case Study #10 - Sustainable Change Programs

By Chelsea Dalton, Project Manager, Sustainability Office, UTSG

The Sustainability Office is on a mission to further engage the UofT community, and to this end UTSG is set to launch their Sustainable Change Programs in late Fall 2021, with a program launch at UTSC and UTM taking place in early 2022. The initial suite consists of 5 programs (Residences, Offices, Events, Labs, and Courses) and will educate, empower, and certify those who act towards a more sustainable future.

The Sustainable Change Programs were developed after reviewing and benchmarking best practices at peer institutions and consulting with a wide range of stakeholders to ensure that we offer best-in-class programs.

Program participants can log on to a web portal and complete a self-assessment form. Once the form is reviewed by the Sustainability Office, participants will receive a certification that, depending on their overall score, could be Bronze, Silver, Gold, or Platinum (or a simple "certified" for Courses). Certified participants will receive a certificate, badge (or ribbon for individual participants), and best practices they can use to improve their score in the future.

Offices and Residences can also be certified on different scales – ranging from individuals all the way up to an entire dorm or office.

In addition, an online leader board will show program participant scores, creating an atmosphere of friendly competition amongst students, staff, and faculty.

The program is envisioned to evolve over time, challenging all participants to continually improve their efforts and change their behaviour to create a more sustainable University of Toronto.

For more information or to get certified, visit Sustainable Change Programs or email sustainablechange@utoronto.ca.

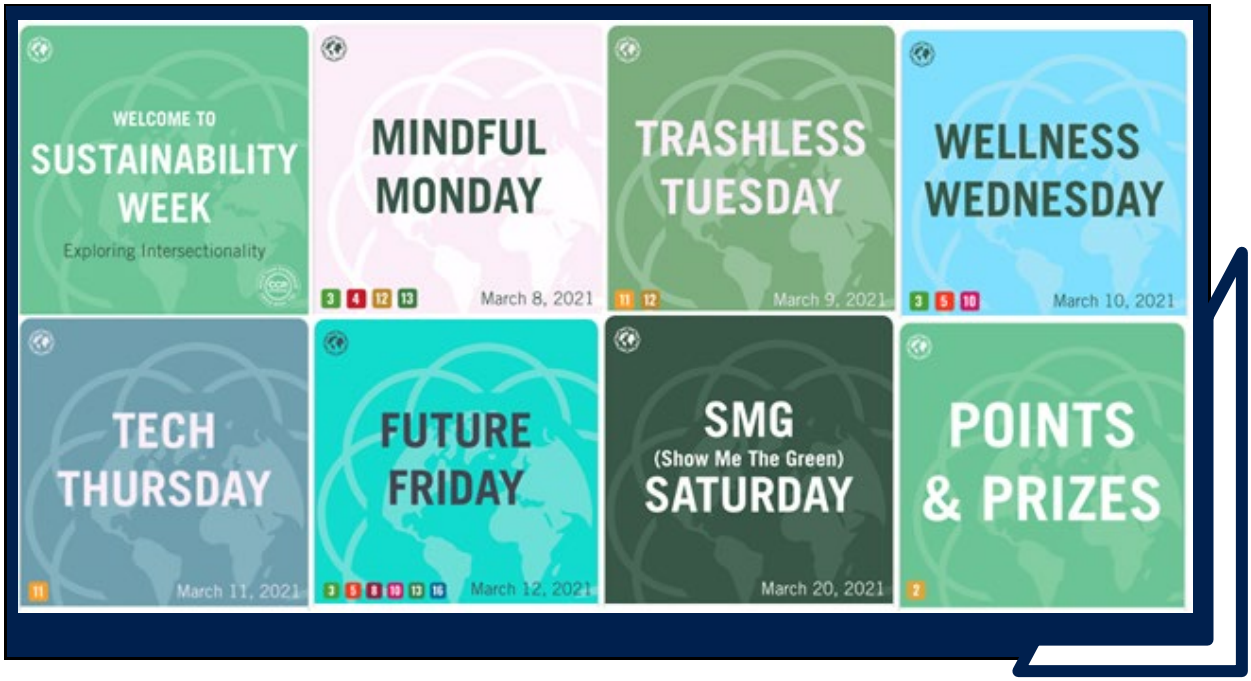
Case Study #11 - UTM: Sustainability Week

By Shashi Kant, Master of Science in Sustainability Management Program Director, Institute for Management and Innovation
and Diana Aldaz, Sustainability Projects & Engagement Coordinator, Master of Science in Sustainability Management Program, Institute for Management & Innovation

In March 2020, students from the Master of Science in Sustainability Management (MScSM) program had the idea to bring an engagement opportunity to the University of Toronto Mississauga (UTM) campus. Together with other student groups, UTM's first Sustainability Week was organized. The purpose of this initiative was to bring sustainability awareness topics to the UTM community, including students, faculty, and staff. Students' participation was overwhelming throughout the week, with over 40 events run by students.

In 2021, Sustainability Week was moved online. Despite the pandemic, the mission to celebrate sustainability initiatives at UTM and to build meaningful connections among the campus community to work towards a sustainable future continued. The theme for this year was *Exploring Intersectionality in Sustainability*, looking at how sustainability intersects not only with the environment, but all aspects of life. The programming is also aligned with the UN Sustainable Development Goals (SDG), linking each daily theme to the respective SDG. A virtual portal was created where students had access to live events, workshops, competitions, and webinars. Both the 2020 and 2021 offerings provided students with an opportunity to achieve the Co-Curricular Record (CCR) recognition. In person, students could either volunteer or attend certain events to apply for CCR. Online, students had to attend various "live"/synchronous virtual sessions to apply. A new element that was introduced in the 2021 programming was *Points and Prizes*, where we partnered with the UTM Student Union and the UTM Food Centre to encourage engagement among students. For each activity that students participated via the portal, points were collected and translated into funds to support the UTM Food Centre, supporting programming and SDG 2. Moving forward, both the online portal and in-person components will be offered for UTM Sustainability Week.

For more information on Sustainability Week, please visit:
https://www.acadiate.com//ee/utmsustainabilityweek/Lobby?show=schwk&item=1of3&page=1&acadtoken=4c8fe404&showcase=1806941620



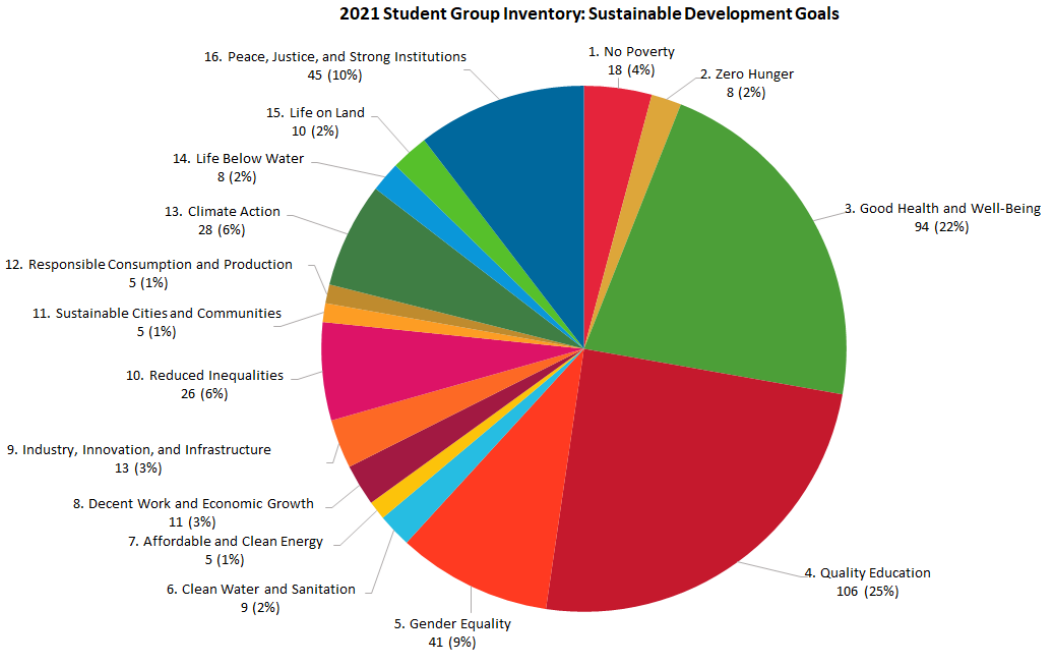
3.3.4 Student Group Inventory

There has been a rapid growth in the total number of University of Toronto student groups incorporating Sustainable Development Goals into their objectives over the past two years.

The 2021 (2020-2021) Student Group Inventory is the 3rd edition of this inventory completed by CECCS. This list includes student groups, clubs, societies, unions, and associations at all three U of T campuses and affiliated colleges with mandates that align with the United Nations (UN) Sustainable Development Goals (SDGs). The groups were identified through student group networks, searches from the U of T ULife website, U of T Environmental Research Network (UTERN), and other university associated websites and networks. The 2021 inventory was compiled by first using a set of Python programs, where organization names and descriptions were matched to a set of keywords related to each SDG. The identified organizations and keywords were then manually screened to ensure relevance to the UN Sustainable Development Goals.

The resultant list is sortable by Club Name, Campus Association, Areas of Interest, Keywords, and SDGs Covered. The associated Club Description, URL (to the ULife or UTERN registry), Primary Contact, Club Email, Club Website, and social media links (Twitter, Facebook, and Instagram) were also documented.

The 2021 Student Group Inventory, published on the U of T Sustainability website, shows 242 (or roughly 30%) student groups across the University's three campuses and affiliated colleges that have integrated the UN SDGs into their mandates out of over 800 student groups. This number is up from 67 groups in 2018-2019, and 130 groups in 2019-2020 - a 250% increase in two years.
The breakdown of Sustainable Development Goals across these student groups is as follows.



3.4 Engagement & Partnerships

The Engagement & Partnerships (E&P) Subcommittee has taken over most of the responsibilities of the former Agent of Change Subcommittee, to promote U of T's local and international sustainability partnerships. The E&P Subcommittee Chair is Derek Newton, Assistant Vice-President, Innovation, Partnerships and Entrepreneurship at the Innovations & Partnerships Office (IPO).

3.4.1 U7+ Alliance

The **U7+ Alliance**, founded in 2019 in advance of the G7 Summit in France, is a unique international partnership that brings together 50+ leading universities, including universities in each of the G7 nations as well as in Africa to tackle the most pressing global challenges of the day. At the inaugural U7+ Alliance summit, the presidents of member universities collectively made commitments in 5 key areas, each of which speaks to the "inherent responsibility of being a world-class university today." One of those areas ("Principle 3") is climate and energy transitions, or more broadly, addressing environmental and sustainability issues.

As stated in Principle 3, the U7+ recognizes that universities have a major role to play in addressing environmental issues and challenges to sustainability such as climate change, biodiversity, and energy transition. This includes leading by example on the respective campuses of U7+ members. The participating universities in Principle 3 have committed to work together on two specific actions:

- Action 1 (access to sustainability courses) is co-championed by U of T, Paris Sciences et Lettres (PSL), and the University of Edinburgh (UoE),

- Action 2 (GHG emissions reduction and energy efficiency) is co-championed by UoE and U of T.

As the UK hosted the G7 Summit in Cornwall with a priority on tackling climate change and preserving biodiversity in June 2021, and the UN Climate Change Conference (COP 26) in Glasgow in November 2021, the U7+ steering committee has selected sustainability and climate change as the theme for the 2021 U7+ Presidential Summit in October 2021. This was done with the goal of articulating and affirming the key role of universities in contributing to such global challenges and informing the ongoing work and discussions of the G7 and at COP26.

U of T's U7+ activities are led by the Office of the Vice-President, International, supported by CECCS. As co-champions of both Action 1 and 2, CECCS co-led two workshops in 2021. See Case Study #12 for more details.

Case Study # 12 - U of T's Participation in U7+

By Julia Kulik, Special Projects Officer, Office of the VP, International

The U7+ Alliance is a unique forum for leading universities worldwide to demonstrate the role they play and the responsibility they carry in a multilateral framework. It is an opportunity for universities from over 20 countries to share best practices and learn from one another in order to take meaningful collective action in the face of the most pressing global challenges.

Since 2019 U of T has worked with other U7+ members on several other Principles and Actions to which U of T is a signatory. This includes Principle 2, where the focus has been on developing a statement of principle on the importance of in-person international experience while also innovating to find new models of student global engagement. U of T also participates on Principle 4, where it has shared best practices for developing students' inclusive leadership and global citizenship competencies. On Principle 5 Action 1, U of T continues to engage with other participating members and leverage the U7+ network to expand and deepen its partnerships related to the UN Sustainable Development Goals. U of T became a signatory to Principle 5 Action 4, which commits to exercising strong leadership, alongside tech companies and governments, in developing and promoting guidelines about how data sciences and digital innovation should be handled.

U of T is also a member of the U7+ Executive Committee, where it contributes to discussions and planning related to the Alliance's membership, ongoing focus, and long-term sustainability. It also participates in the G7 Engagement and Influence Group, which recently released a statement during the 2021 G7 Summit in Cornwall on the U7+ Alliance's commitment to working with the G7 to recognize the key role that universities play as primary global actors that can support the G7's efforts to tackle climate change, strengthen resilience against future pandemics, and prioritize the interests and rights of youth and future generations.

Between August 2020 and June 2021, U of T worked with the participating members of Principle 3 to gather information on existing programs and policies across each institution, share best practices – specifically on international business travel and sustainability course inventories and pathways, discuss barriers and challenges to this work, and identify opportunities for collective action. This activity helped guide the development of the *Greenhouse Gas Reduction and Energy Efficiency Framework* and recommendations for action to increase and enhance sustainability curricula.

U of T recognizes that no global challenge is greater or more urgent than the

climate crisis and thus, working with colleagues across the Alliance, it developed a set of recommendations that all universities were asked to adopt. These are:

- For Action 1 – promoting that all students of our universities will have access to courses related to climate, biodiversity, and sustainability.
  - Recognize and validate the importance of course inventories to take stock of existing courses with sustainability-related content. Make the findings of these inventories a more accessible resource for the student body.
  - Develop sustainability pathways - clusters of courses and co-curricular activities with a common theme of sustainability that allow students to explore the theme from various disciplinary, methodological, and practical perspectives.
  - Engage students in discussions on sustainability education by facilitating and structuring consultations that recognize the diversity of perspectives and needs.
- For Action 2 – reducing GHG emissions from 2018 levels by 2030, with the goal of developing and publishing a specific target for this reduction.
  - Measure scope 1 (owned sources) and 2 (purchased electricity, heat, and steam) GHG emissions using standard tools and collect information and feedback on existing targets/plans relating to energy and GHG emissions. Universities that do not own their capital stock should engage facility owners about developing measurements and plans.
  - Benchmark energy consumption and GHG emissions to determine where opportunities for improvement exist.
  - Commit, or work with facility owners to commit, to energy and GHG reduction targets and publish plans to meet these targets.
  - Review and evaluate the performance to determine whether the targets were achieved and communicate the results to stakeholders.
  - Begin developing approaches to estimating, benchmarking, and ultimately addressing Scope 3 emissions, such as business travel, employee commuting, waste disposal, purchased goods and services.

These recommendations were unanimously supported and adopted by 29 universities, including all of those present at the Presidential Summit held in October 2021.

3.4.2 University Climate Change Coalition (UC3)

The University Climate Change Coalition (UC3) was established in 2017 to mobilize university resources and expertise in North America to accelerate local and regional climate action in partnership with businesses, cities and states, foundations, and other organizations. U of T was one of the inaugural members, and since 2017 the network has grown to 23 members: 4 Canadian, 2 Mexican, and 17 American.

U of T has been actively involved in UC3 and in 2021 we strengthened our leadership in the coalition with the addition of John Robinson, CECCS Co-Chair, on the UC3 steering committee. Based on lessons learned over the past two years from cross-sector forums, internal collaborations, webinars, and partnerships with local and regional stakeholders, UC3 has developed a Strategic Plan, which outlines 5 core values, 3 goals and 15 strategies aimed at campus, community and global engagement of member universities on climate action.

The three goals are:

1. Leverage university resources to accelerate and promote climate action research, teaching and/or cocurricular activities on campus Sphere of Influence: Community
2. Foster and strengthen cross-sector partnerships in community to cocreate place-based climate action solutions that reduce GHG emissions and build community resilience Sphere of Influence: Global
3. As an international coalition, elevate and amplify research universities' leadership role in accelerating global climate action and transitioning to a more resilient, low-carbon future

U of T is also the founding member of the UC3's Urban Climate Action Network (UCAN), which currently includes six UC3 universities and is intended to create university/city partnerships on climate action. More information on UCAN can be found in the Research section of this report (see 3.2.1).

3.4.3 THE Impact Rankings

Times Higher Education (THE) is a UK magazine reporting specifically on news and issues related to higher education. THE announced the launch of their University Impact Ranking in 2018 and published the inaugural ranking in 2019. The Impact Ranking aims to assess the impact that universities have outside of their teaching and research missions by measuring universities' performance against the SDGs. More than 1,200 universities participated in the 2021 ranking (up from 850 the previous year), including many universities that are not ranked in THE's World University Rankings. U of T is ranked 34th in the world (down from 28th last year), but 4th in Canada (up from 6th last year).

The Office of the Vice-President, Research and Innovation coordinates the University's submission to Times Higher Education which consists of quantitative data about student and staff demographics, operations, and finances which is combined with information about the University's policies and activities related to the SDGs. CECCS works with OVPRI to review data and contribute information that is used as evidence for some of the statistics, in particular for SDG 17 - Partnerships for the Goals. The Impact Rankings have raised the University's awareness and the importance of SDG

related activities among students, staff and faculty. Additionally, The University is one of only 10 institutions globally to be represented on the THE Impact Rankings advisory board, which provides input on how to improve the rankings responsibly.

3.4.4 Sustainable Buildings Canada: Better Buildings Boot Camp 2021

Organized by Sustainable Buildings Canada in partnership with U of T (CECCS was the U of T secretariat), OCAD University, Ryerson University, and York University, the 2021 boot camp was extended to include graduate students from three more higher education institutions in Toronto -- Carleton, Seneca and George Brown. The Better Buildings Boot Camp was held virtually again this year, from August 23-27, 2021. This boot camp engaged with over 40 graduate students from the seven universities. This free week of instruction and engagement on sustainable building design for graduate students focused on deep building retrofits using the Health Sciences block at St. George campus as the case study.

Students from these institutions represented a diversity of fields of study, from Chemical, Civil, Environmental and Mechanical Engineering, to Building Systems Technology, to Strategic Foresight and Innovation, Inclusive Design, Designing for Health, Building Science, Architecture, Environmental Studies, Interior Design and Arts, Project management and Sustainable Energy. They formed 9 interdisciplinary and cross institutional teams that participated actively throughout the boot camp and provided informed and insightful recommendations for the U of T team.

The week long virtual boot camp included sessions led by subject matter experts on the following topics:

- Deep Energy Retrofits
- Human Centric Design
- Accessibility
- Lighting
- Mechanical Systems
- Solar
- Financing Buildings
- Opaque Assemblies
- Fenestration
- Energy Modelling

See Appendix 10 for the program of the Better Buildings boot camp event.

Case Study #13 - Nikibii Dawadinna Giigwag - Indigenous Youth Access Program

By Professor Liat Margolis, Associate Dean, Research, and Director, Green Roof Innovation Testing Laboratory, Faculty of Architecture, Landscape, and Design,

Nikibii Dawadinna Giigwag – Anishinaabemowin for Flooded Valley Healing – is an employment, mentorship and pathway to postsecondary education program for Indigenous youth at the University of Toronto Daniels Faculty of Architecture, Landscape and Design. The program weaves together cultural teachings with landscape architecture and environmental conservation. Each summer, up to 10 youth, ages 15-25, are employed full time by the Daniels Faculty for seven consecutive weeks to work with academic, professional and community mentors and partnering organizations on ecological restoration and planting design projects. These include medicine gardens, green roofs, urban agriculture, campus landscapes, restoration of post-industrial sites, and food forests, with 700 native trees and shrubs planted annually. Teachings shared by Elders and Knowledge Keepers strengthen the youth's cultural identity and connection to land. Academic and professional mentors introduce various education and career paths related to green infrastructure and sustainability, including landscape architecture, Indigenous and environmental studies, traditional and urban food systems, ecological restoration, and urban forestry.

Photo credit: Tara Mabon, City of Toronto Urban Forestry

This program addresses the U of T Truth and Reconciliation Calls to Action by supporting Indigenous curriculum and land-based pedagogy, access for Indigenous students, teachings and leadership roles for Elders and Knowledge Keepers, cultural spaces on campus, and increased awareness and engagement by the University community. It also addresses the City of Toronto's goal to increase its forest cover as well as the U of T's climate action, all while giving a platform for the voices of Indigenous youth on the environmental and social challenges we face.

Launched in Summer 2018, the Nikibii Dawadinna Giigwag program is co-led by Elder Whabagoon, First Peoples FALD Dean's Advisor, and Professor Liat Margolis, Master of Landscape Architecture Director and Associate Dean, Research. The program has been made possible through the generous support of the Access Programs University Fund (APUF), City of Toronto Community Planting and Stewardship, PEFAL, and NSERC PromoScience grants, as well as through collaborations with First Nations House, New College, Dalla Lana School of Public Health, St. George and Scarborough Campus Grounds, Toronto and Region Conservation Authority (TRCA), Downsview Park, Evergreen Brickworks, Trophic Design, Two Row Architect, Brook McIlory, Public Work, and Spruce Lab.

Photo credit: Liat Margolis

Instagram: @nikibii_dawadinna_giigwag
Contact: liat.margolis@daniels.utoronto.ca

Case Study #14 - SDG Conceptual Report

By Simon Pratt, Director, Research Strategy & Excellence, Office of the VP, Research & Innovation

When analyzing the results of the 2019 THE Impact Rankings it was clear that the University was being penalized by not having a publicly available SDG report. It was also found that, although still a minority at that time, many institutions in Canada had already published reports. Working with the CECCS and OVPRI it was decided to develop a conceptual SDG report that would fulfil the requirements of THE, and set the groundwork for a more comprehensive and fulsome official report at a later date. After reviewing the design elements of reports from other institutions it was decided to model the report on a two-page spread for each SDG with a common template for each. A data driven approach was the starting point whereby some common data elements for each SDG (for example the number of SDG related courses taught) were combined with SDG specific data (for example the amount of water used at the University for SDG 6) to create a SDG specific profile of the University's multiple missions. The data was combined with information about the University's activities, outreach programs, and SDG related news. The end result provides an overall view of the University's involvement with the SDGs related to the University's Research, Innovation, Teaching, Operations, Outreach and Partnerships.

The report is available at https://data.utoronto.ca/wp-content/uploads/2020/02/SUSTAINABLE-DEVELOPMENT-conceptual-report.pdf

Case Study #15 - UTSC Social Procurement with Trades

By Jeffrey Miller, Director, Facilities Management & Capital Projects, UTSC

As the campus grows, it not only builds on its role as a centre for education, but it also generates greater economic and social impacts that are felt throughout the broader community. Properly leveraged, these impacts can lead to new investment in housing, business, and community development.

As an anchor institution, UTSC is committed to both training and development of young people and leveraging its place in the community to build and create local opportunities for employment. To this end, UTSC has partnered with East Scarborough Storefront, Hammerheads and other Trade Union locals to create apprentice opportunities for local community members on all our major construction projects.

The East Scarborough Storefront has established a place-based workforce development strategy titled East Scarborough Works. The goal of this program is to build strong connections between the supply of qualified local candidates and local employer demand, to ensure that local infrastructure projects benefit local residents. Recent construction projects at the University such as the Environmental Science and Chemistry Building and Highland Hall have created opportunities to work with the builders to initiate an apprenticeship program for underserved youth on the construction projects.

This “community benefit language” has been incorporated in the University's tender documents for major construction projects. With its success, UTSC plans on including the program in future construction projects on campus. The number of Apprenticeships at Highland Hall, ESCB, The Passive House Student Residence and the Instructional Center 2 to this point is 10 and pathways are being created as part of UTSC’s development into the future.

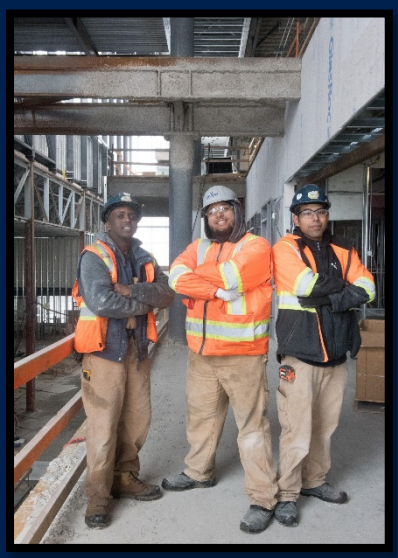


Photo credit: University of Scarborough
Hammerheads on site at UTSC

Appendices

Appendix 1 - Calls for Nominations

- https://memos.provost.utoronto.ca/call-for-nominations-committee-on-the-environment-climate-change-and-sustainability-pdadc-58/
- https://memos.provost.utoronto.ca/call-for-nominations-for-staff-seat-committee-on-the-environment-climate-change-and-sustainability-pdadc-71/

Appendix 2 - CECCS Membership

Current CECCS Membership

Key:

Faculty	Alumni	Student	Staff

Name	Affiliation	Type
John Robinson	Professor, Presidential Advisor on the Environment, Climate Change, and Sustainability	Co-Chair
Ron Saporta	Chief Operating Officer, Property Services & Sustainability	Co-Chair
Aimy Bazylak	Associate Professor, Faculty of Applied Science & Engineering	Faculty
Steve Easterbrook	Professor and Director, School of the Environment	Faculty
Jan Mahrt-Smith	Associate Professor, Rotman School of Management	Faculty
Liat Margolis	Professor, Associate Dean, Research, and Director, Green Roof Innovation Testing Laboratory, Faculty of Architecture, Landscape, and Design	Faculty
Fiona Miller	Professor and Chair in Health Management Strategies, Institute of Health Policy, Management and Evaluation, Dalla Lana School of Public Health	Faculty
Tenley Conway	Professor, Department of Geography, Geomatics & Environment, UTM	Faculty
Nicole Klenk	Associate Professor, Department of Physical & Environmental Sciences, UTSC	Faculty
Romila Verma	Lecturer, School of the Environment and Department of Geography	Faculty
Hilary Inwood	Lecturer, OISE	Faculty
Lisa DeMarco	Senior Partner and CEO at Resilient LLP	Alumni
Alexandria Gill	Political Science & Public Policy, UTSC	Undergraduate Student

Amanda Harvey-Sánchez	PhD Candidate, Anthropology	Graduate Student
Andrew Arifuzzaman	Chief Administrative Officer, University of Toronto Scarborough	Staff
Marc Couture	Director, Sustainability & Energy Management	Staff
TBC	Chief Administrative Officer, University of Toronto Mississauga	Staff
Daniella Mallinick	Director, Academic Programs, Planning & Quality Assurance, Office of the Vice-Provost, Academic Programs	VP Liaison
Kim McLean	Chief Administrative Officer, Faculty of Arts and Science	Staff
Derek Newton	Assistant Vice-President, Innovation, Partnerships and Entrepreneurship	VP Liaison
Shannon Simpson	Director, Indigenous Initiatives	Staff
TBC	Chief, University Planning, Design & Construction, Office of the Vice-President, Operations and Real Estate Partnerships	Staff
Karen Shim	Communications Associate in the Office of the Vice-Provost, Academic Programs	Staff
Ayako Ariga	Project Manager, Curriculum Innovation, and Secretariat, CECCS	Secretariat
Dione Dias	Project Manager, Agent of Change, and Campus as a Living Lab, CECCS	Secretariat
Conchita Ferrao	Administrative Coordinator, CECCS	Secretariat

Emeritus Members

Name	Affiliation	Type
Shashi Kant	Professor and Director, Master of Science in Sustainability Management Program, University of Toronto Mississauga	Faculty
Bryan Karney	Professor and Associate Dean, Cross-Disciplinary Programs, Faculty of Applied Science & Engineering	Faculty
James MacLellan	Assistant Professor and Program Director, Environmental Studies Department of Physical and Environmental Sciences, University of Toronto Scarborough	Faculty
Jennifer Murphy	Professor and Associate Chair, Graduate Studies, Department of Chemistry, Faculty of Arts & Science	Faculty
David Roberts	Assistant Professor, Department of Geography & Planning, and Urban Studies Program	Faculty
Claire Westgate	Placement & Employer Relations Officer, MScSM Program, University of Toronto Mississauga	Staff
Aviatar Inbar	Master of Science in Sustainability Management Program Candidate at University of Toronto Mississauga	Graduate Student

CECCS Subcommittees

Teaching & Learning Subcommittee	**Research Subcommittee**	**Operations Subcommittee**	**Engagement & Partnerships Subcommittee**
Alexandria Gills	Aimy Bazylak	Marc Couture *(Chair)*	Andrew Arifuzzaman
Hilary Inwood	Tenley Conway	Alexandria Gill	Lisa DeMarco
Daniella Mallinick	Nicole Klenk	Kim McLean	Steve Easterbrook
Liat Margolis *(Chair)*	Fiona Miller *(Chair)*	Karen Shim	Derek Newton *(Chair)*
Romila Verma	Amanda Harvey-Sanchez	Jan Mahrt-Smith	Amanda Harvey-Sanchez
		CAO, UTM *(vacant)*	Karen Shim
		Chief, UPDC *(vacant)*	Shannon Simpson

Appendix 3 - CECCS Meetings 2020 - 2021

Committee on the Environment, Climate Change and Sustainability

- February 21, 2020
- May 27, 2020
- October 22, 2020
- April 08, 2021
- June 21, 2021
- September 22, 2021

Teaching and Learning Subcommittee

- August 17, 2021
- October 05, 2021
- November 05, 2021

Research Subcommittee

- October 12, 2021

Operations Subcommittee

- October 18, 2021

Engagement and Partnerships Subcommittee

- October 08, 2021

Appendix 4 - UTC Communication Report

UNIVERSITY OF TORONTO COMMUNICATIONS: ENVIRONMENT, CLIMATE CHANGE AND SUSTAINABILITY COMMUNICATIONS REPORT

INTRODUCTION

Since July 2020, University of Toronto Communications (UTC) delivered communications support on a wide range of environment, climate change and sustainability initiatives at the University of Toronto. Working with the President's Advisory Committee on Environment, Climate Change and Sustainability (CECCS), the Sustainability Offices and stakeholders across the three campuses, UTC leveraged its owned, earned and social channels to shine a light on U of T's actions to address climate change as well as enhance and protect the reputation of the University.

OWNED MEDIA

During this period, U of T News published **72 stories** (see Appendix A), generating a total of **83,555 unique page views**, on a number of environment, climate change and sustainability topics. Of these, **16 stories*** profiled the University's institutional initiatives.

The most popular stories were the President's unveiling of new laneway housing, new appointments to deepen commitment to sustainability goals and the President's announcement to divest from fossil fuel investments and create a climate-positive campus, all of which received well-above-average readership[3].

EARNED MEDIA

Our media relations team successfully produced **119 pitches**, resulting in **570 media hits** (see Appendix B), that showcased U of T's latest environmental and climate change research and commitment to sustainable operations. The media relations team also responded to **12 media requests** on a number of sustainability topics, including the laneway housing project and the University Network for Investor Engagement (UNIE).

SOCIAL MEDIA

All U of T News stories related to institutional initiatives were promoted on social media, producing a total of **39 posts**, generating **754,323 impressions**. The top-performing story, on the expansion of the Reach Alliance to three universities, achieved average engagement rates[4] on Facebook (3.61%) and Twitter (3.4%), generating a cross-platform total of **57,112 impressions**[5].

COMMUNICATIONS PLANS

The communications strategy and planning team developed **1 communications strategy** on sustainability and **1 integrated communications plan** in support of the Robert Street Field revitalization, and provided communications guidance and issues briefs for a variety of issues.

[3] A high-performing U of T News story receives more than 1,000 unique page views.
[4] 2020-21 average engagement rates: Facebook – 3.6% | Twitter @UofT – 3.9%
[5] 2020-21 average engagement rates are lower than 2019-20 rates, possibly due to a shift in public interest towards COVID-19 content, which may also account for the overall performance of posts.

APPENDIX A: U OF T NEWS STORIES

2020

- 07/03/2020, U of T and Hebrew University of Jerusalem launch research and innovation partnership (1,301 unique page views)*
- 07/08/2020, U of T researchers to co-lead national Wildland Fire Research Network (332 unique page views)
- 07/17/2020, Experimental garden at U of T Mississauga explores how plants will adapt to climate change (905 unique page views)
- 07/20/2020, Most polar bear populations likely to collapse by end of century if global warming continues (1,163 unique page views)
- 07/23/2020, 'The problem is going to get worse': U of T Scarborough researcher sounds alarm on invasive species (6,259 unique page views)
- 07/24/2020, From space to sustainability: U of T alumnus Julius Lindsay helps physics grads navigate career options (347 unique page views)
- 07/29/2020, Warming Arctic more vulnerable to wildfires like those burning in Siberia: U of T Mississauga climate expert (308 unique page views)
- 08/18/2020, Project led by U of T researcher to target at-risk fish in lower Great Lakes (651 unique page views)
- 09/14/2020, On the move: U of T e-scooter startup launches expansion during COVID-19 (1,249 unique page views)
- 09/15/2020, U of T-led partnership to accelerate search for new sustainable energy and smartphone materials (1,146 unique page views)
- 09/17/2020, Predator loss, climate change combine to devastate Alaskan reefs: U of T study (288 unique page views)
- 09/17/2020, 'An unacceptable plastic future': U of T ecologists sound alarm in new study of global waterways (807 unique page views)
- 09/28/2020, Low-carbon health care: U of T, local hospitals launch Sustainable Health System Community of Practice (487 unique page views)
- 09/30/2020, U of T's Ontario Institute for Studies in Education hosts first-ever climate summit, embarks on action plan (234 unique page views)*
- 10/13/2020, Earth-friendly fashion: U of T startup turns food waste into wearables (2,009 unique page views)
- 10/19/2020, 'We all have a role': Adams Sustainability Celebration highlights U of T sustainability initiatives (899 unique page views)*

- 10/26/2020, Toronto's low-income and racialized communities have fewer trees: U of T

researchers (1,266 unique page views)

- 10/29/2020, Using tree bark, U of T researcher develops new generation of sustainable products (1,720 unique page views)
- 10/30/2020, U of T, University of Illinois form partnership to enhance global leadership of Great Lakes region (736 unique page views)*
- 11/02/2020, U of T students host global AI competition to address climate change (1,857 unique page views)
- 11/03/2020, Resilience and climate change: Archaeologists reveal human adaptability in ancient Turkey (577 unique page views)
- 11/05/2020, From electric trucks to 'curbside management,' Smart Freight Centre studies how to improve flow of goods (238 unique page views)
- 11/05/2020, U of T Scarborough breaks ground on new 750-bed residence (3,671 unique page views)
- 11/09/2020, Using tree rings, U of T researchers measure history of mercury contamination in Yukon (357 unique page views)
- 11/17/2020, With U of T as a partner, advanced materials research facility in Mississauga to focus on clean energy (585 unique page views)*
- 12/03/2020, Fighting climate change through responsible investing: U of T President Meric Gertler (761 unique page views)*
- 12/03/2020, With a focus on intergenerational equity, U of T joins global universities for U7+ summit (262 unique page views)*
- 12/09/2020, Do no harm? PhD students target pollution from health-care sector (324 unique page views)
- 12/11/2020, Researchers at U of T Scarborough help isolate salmon-killing chemical in car tires (827 unique page views)
- 12/21/2020, Sustainability research gets boost from DC microgrid at U of T Engineering (420 unique page views)

2021

- 01/05/2021, Ice arches holding Arctic's ‘Last Ice Area’ in place are at risk, U of T researcher says (795 unique page views)
- 01/06/2021, Drought, deforestation in Amazon exacerbate COVID-19 impact: U of T researcher (733 unique page views)
- 01/15/2021, U of T training and research program to focus on green roofs, other 'living' infrastructure (888 unique page views)*
- 01/19/2021, ‘Beautifully designed and beautifully built’: U of T unveils new laneway, infill housing (10,273 unique page views)*
- 01/25/2021, ‘Waste-to-wardrobe’ startup wins U of T's top Adams Sustainability Innovation Prize (2,170 unique page views)*
- 02/02/2021, U of T students, researchers brainstorm ways to advance UN Sustainable Development Goals (900 unique page views)*
- 02/02/2021, With new appointments, U of T deepens commitment to sustainability goals (2,076 unique page views)*
- 02/03/2021, U of T researchers develop app to track environmental health of neighbourhoods (1,283 unique page views)
- 02/05/2021, Focused on sustainability, U of T startup puts insects on the menu – for your pet (651 unique page views)
- 02/17/2021, Prize-winning U of T student team uses AI to beat banana blight (2,182 unique page views)
- 02/18/2021, U of T Trash Team and PortsToronto battle plastic pollution in Lake Ontario (336 unique page views)
- 02/18/2021, Common agricultural pesticide may be putting hummingbirds at risk: U of T study (1,354 unique page views)
- 02/18/2021, U of T, other universities form coalition to strengthen engagement and reduce climate-related risks in their investment portfolios (797 unique page views)*
- 02/19/2021, Climate change slows reduction of methylmercury levels in Arctic: U of T researchers (296 unique page views)
- 03/09/2021, Pollution disrupts water fleas' 'chemical conversations,' disrupts food chain: U of T study (284 unique page views)
- 03/16/2021, U of T study shows winter road salt poses year-round threat to aquatic life in Toronto’s rivers (671 unique page views)
- 04/16/2021, U of T students part of first Canadian team to win prestigious urban design competition (2,235 unique page views)

- 04/19/2021, School of the Environment to showcase undergrads' work at annual Research Day (115 unique page views)
- 04/20/2021, U of T Mississauga's Maanjiwe nendamowinan recognized for excellence in design (294 unique page views)
- 04/22/2021, Making every day Earth Day: Why one U of T student became a climate activist (257 unique page views)
- 04/26/2021, High-flying U of T alumna helps pioneer all-electric personal aircraft (1,428 unique page views)
- 04/30/2021, Reach Alliance, first launched at U of T, expands to three universities outside Canada (1,571 unique page views)*
- 05/13/2021, An oasis of green: How U of T keeps campus trees safe and healthy (1,734 unique page views)
- 05/19/2021, Community Climate Resilience Lab brings racial justice lens to climate change research (564 unique page views)
- 06/07/2021, U of T researcher leads project focused on transitioning health-care system to 'net-zero' emissions (487 unique page views)
- 06/07/2021, Low-pH system developed by U of T researchers recycles more CO2 into valuable products (391 unique page views)
- 06/11/2021, As member of global university alliance, U of T supports call for G7 leaders to prioritize future generations (629 unique page views)*
- 06/21/2021, Pioneering climate change researcher Warren Washington receives honorary degree (209 unique page views)
- 07/12/2021, U of T researcher explores ways to make Toronto's urban forests, ravines more inclusive (1,980 unique page views)
- 07/20/2021, 'Like an arms race': U of T researchers study impact of household water pumps on Delhi's water system (823 unique page views)
- 08/18/2021, Can green infrastructure keep microplastics out of the environment? (576 unique page views)
- 08/27/2021, While you were away… U of T was busy building for the future (3,882 unique page views)
- 08/30/2021, U of T statistics students analyze oceans of data to understand how water temperature affects sharks (363 unique page views)
- 09/03/2021, U of T researcher explores impact of climate change on food security in the Yukon (554 unique page views)
- 09/16/2021, Cities need to boost resident knowledge of green infrastructure: U of T study (425 unique page views)

- 09/23/2021, Higher levels of organic pollutants found in homes located near natural gas wells: U of T study (341 unique page views)
- 09/30/2021, Want to reduce your carbon footprint? Build a smaller house with no basement: U of T study (783 unique page views)
- 10/13/2021, 'Inadequate and unsafe': U of T report highlights need for better walking and cycling network in Scarborough (311 unique page views)
- 10/14/2021, U of T alumnus Olugbenga Olubanjo one of 15 finalists for $1.7-million Earthshot Prize (1,189 unique page views)
- 10/14/2021, Indigenous artists transform tree protection hoardings outside Hart House into eye-catching murals (268 unique page views)
- 10/22/2021, How can lizards adapt to a changing climate? (188 unique page views)
- 10/27/2021, U of T to divest from fossil fuel investments, create climate-positive campus (4,323 unique page views)*

APPENDIX B: EARNED MEDIA COVERAGE

2020

- 07/05/2020, Researchers find microplastics in nearly every sample taken in the Eastern Canadian Arctic (Canadian Geographic) (2 hits)
- 07/20/2020, Peter Molnar on the disappearance of polar bears (The Guardian) (1 hit)
  Additional coverage: New York Times (1 hit), Washington Post (1 hit)
- 09/02/2020, Your denim could be destroying some of the world's most precious water bodies, new study finds (Canadian Press) (52 hits)
  Additional coverage: WTAQ-AM Radio (1 hit), City Toronto (3 hits), CityNews Edmonton (4 hits), Newstalk800 (2 hits), AM980 (2 hits), CityNews Winnipeg (2 hits), CBC Radio (2 hits), CityNews Calgary (4 hits), CBC Radio One (2 hits), Newsweek (1 hit)
- 09/14/2020, Those smoky skies over Vancouver area glimpse of the future. Here's what experts say we can expect (Toronto Star) (1 hit)
- 10/13/2020, Opinion: Are we locked into a plastic future? (Toronto Star) (1 hit)
- 11/03/2020, U of T, University of Illinois form partnership to enhance global leadership of Great Lakes region (1 hit)

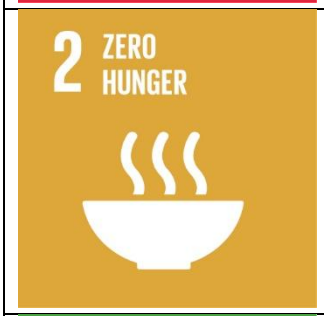
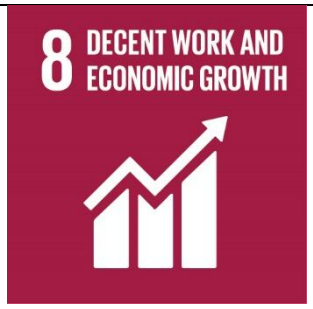
2021

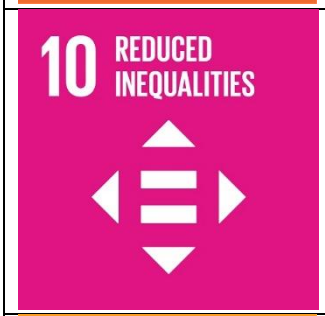
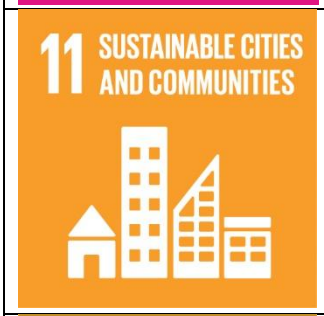
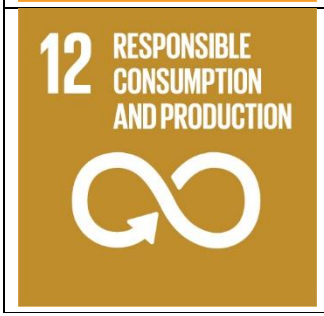
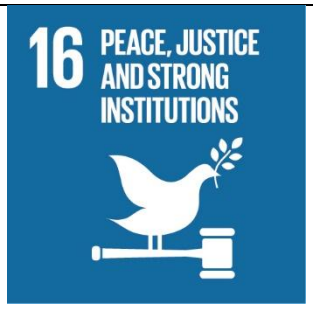
- 01/06/2021, Kent Moore on loss of Arctic ice (Daily Mail) (1 hit)
  Additional coverage: BBC (3 hits)
- 01/21/2021, Can universities manufacture a post-industrial future for the Midwest? (Times Higher Education) (2 hits)
- 03/11/2021, Alexandre Milovanoff on electric cars and the environment (New York Times) (2 hits)
  Additional coverage: Wall Street Journal (2 hits)
- 04/19/2021, So what has the rest of the world promised to do about climate change? (The Guardian) (2 hits)
- 05/24/2021, Now is the time to invest in transit (Toronto Star) (1 hit)
- 06/15/2021, Some long-wear makeup linked to toxins harmful to health and environment, study says (Canadian Press) (73 hits)
  Additional coverage: CBC *(link not available)* (20 hits)
- 07/01/2021, Arctic's Last Ice Area losing twice as much ice compared to rest of region: Study (CBC) (6 hits)
  Additional coverage: Canadian Press (27 hits)
- 09/23/2021, Homes near fracking sites in B.C. have higher levels of some pollutants, study finds (Canadian Press) (170 hits)

Additional coverage: CBC Radio One (1 hit)

- 10/05/2021, Avoid building basements to help the environment: U of T researchers (NOW) (1 hit)
- 10/12/2021, Study suggests higher contaminants in B.C. homes near fracking wells but more research is needed (The Narwhal) (1 hit)
- 10/13/2021, Avoid building basements to help the environment: U of T researchers (The Georgia Straight) (1 hit)
- 10/27/2021, University of Toronto to fully divest $4 billion endowment from fossil fuels by 2030 (Canadian Press) (93 hits)
  Additional coverage: Reuters (11 hits), Bloomberg (24 hits), BNN Bloomberg (4 hits), The Globe and Mail (4 hits), Times Higher Education (1 hit), National Observer (3 hits), Global News (3 hits), CBC (6 hits), CP24 (1 hit), Narcity (1 hit), Academia (1 hit), iPolitics (1 hit), The Logic (1 hit), 680 News (2 hits), 660 News Calgary (2 hits), AM 1150 Kelowna (1 hit), AM 900 Hamilton (2 hits), News 1130 Vancouver (2 hits), U of T Radio (1 hit), AM 1070 Victoria (1 hit), iHeart Radio (1 hit)

Appendix 5 - SDG-Related Keywords for undergraduate course inventory

SDGs	Keywords	SDGs	Keywords
	poverty, income distribution, wealth distribution, socio economic, socioeconomic, socio-economic		gender, women, equality, girl, queer
	agricultur*, food, nutrition		water, sanita*
	health, well being, wellbeing, well-being		energy, renewabl*, wind, solar, geothermal, hydroelectric
	educat*, inclusiv*, equitable		employment, economic growth, sustainable development, labour, labor, worker, wage

SDGs	Keywords	SDGs	Keywords
	infrastructure, innovat*, industr*, buildings		climate, greenhouse gas, environment, global warming, weather
	trade, inequality, financial market, taxation		ocean, marine, water, pollut*, conserv*, fish
	cities*, urban, resilien*, rural, sustainable development		forest, biodivers*, ecolog*, pollut*, conserv*, land use
	consum*, production, waste, natural resource*, recycl*, industrial ecology, sustainable design		justice, institut*, governance, peace, rights

SDG 17 “Partnerships for the Goals” was excluded from our keyword search methodology, as it encompasses the act of achieving the other goals rather than bringing a new perspective to sustainability, making it poorly-fitting for this purpose.

Appendix 6 - Draft Paper on Sustainability Governance in 10 Universities

This draft paper will be circulated to colleagues at the other nine universities for their comments and inclusion as authors before being submitted to a journal.

Implications of cultural-structural divergences between academic and operational sustainability governance on a tailored whole-institution approach: Lessons from 10 universities across 6 continents

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INTRODUCTION

In recent decades, as the concept and urgency of sustainability have expanded on a global scale, universities have faced growing pressure—by their internal members and external stakeholders—to commit to sustainability action within their own institutions (Bauer et al., 2020; Branje et al., 2016). A parallel scholarship of Sustainability in Higher Education (SHE), has developed, suggesting that there have been three observable waves of sustainability action at universities (Baker-Shelley et al., 2017; Henderson et al. 2017; Hoover & Harder, 2015; Wals & Blewitt, 2010). The first wave occurred in the 1970s and focused on the integration of environmental sustainability into teaching and research (Ralph & Stubbs, 2014; Wals & Blewitt, 2010). This was followed by a second wave at the turn of the twenty-first century that aimed to reduce the environmental footprint of campuses (Ralph & Stubbs, 2014). Now, in the midst of the third wave and an expanding global understanding of sustainability, universities seek to emphasize a more holistic integration of sustainability into the domains of education, research, operations, and community engagement (Henderson et al., 2017; Wals & Blewitt, 2010).

This holistic integration of sustainability encompasses scholarly research and on-the-ground action to advance a "whole institution approach of sustainability" (Baker-Shelley et al., 2017; Mader et al., 2013). This approach differs in important aspects from previous waves of sustainability action. Firstly, the whole institution approach (WIA) effectively takes a wider definition of sustainability, taking into account its environmental, economic, and social foundations (Bauer et al. 2020; Henderson et al., 2017; Wals & Blewitt, 2010). Secondly, and in relation to the epistemic expansion of sustainability, the WIA seeks to take into consideration not only *what* sustainability actions are enacted, but *how* they are enacted across education, research, operations, and community engagement (Henderson et al., 2017; Hoover & Harder, 2015). As part of this procedural focus, the nature and mechanisms of university governance have emerged as an essential point and challenge for the implementation of a whole institution approach to sustainability (Bauer et al. 2020; Bieler & McKenzie, 2017; Leal Filho et al. 2020; Niedlich et al. 2020; Purcell 2019; HOCHN 2019).

Through comparative case studies of ten different universities around the world that are leaders in sustainability action, our research aimed to better illuminate the different governance approaches and possibilities for the development of a whole institution approach to sustainability. Recognizing that universities have multiple sustainability cultures and locations of power—eg. different governance processes for academic and operational sustainability (Hoover & Harder, 2015)— we sought to examine the current activities of and barriers to sustainability governance at universities, from both its operational and academic foundations and throughout the domains of education, research, operations, and community engagement. Our research questions were: how do operational governance and academic governance differ in their activities and approaches to sustainability? How can these differences be better considered and harnessed when striving for a whole institutional approach to sustainability? In creating a distinction between operational and academic governance, we do not seek to dismiss the increasing entanglement between these two forms of governance (Ferrer-Balas et al., 2008; Scott & Gough, 2006; Rowlands, 2017; Trencher, 2014). Rather, we strive to elucidate and provide principles for a more representative and integrated approach to whole institution sustainability governance in universities.

LITERATURE REVIEW

(Good) Governance of Sustainability at Universities

At a general level, university governance can be understood as the policy frameworks, administrative apparatus, and other relevant resources used to implement effective management of complex processes (Leal Filho et al., 2020; HOCHN 2019; Song, 2019). More often than not, the implementation and management itself is also included as part of the definition of governance; Niedlich et al. (2020) describes governance as the "process of steering society and economy through collective action and in accordance with common goals" (p.2).

SHE literature on governance is mainly concerned with what constitutes "good governance"—that is, what type and features of governance can best enact a whole institution approach to sustainability transformation at universities, embodying the domains of education, research, operations, and community engagement. What surfaces—from case studies, surveys, meta-analysis, and framework creations—is an endorsement of sustainability transformation that is representative and democratic in its governance approach. Good governance is associated with the involvement and shared prioritization of the university's multiple 'stakeholders,' which includes the university management, the student body, the professoriate and teaching community, the administrative and operational staff, and external stakeholders from community organizations to large corporations (HOCHN 2019; Djordjevic & Cotton, 2011; Hoover & Harder, 2015; Niedlich et al. 2019).

Concurrently, these studies point to the importance of a centralized approach, such as stronger managerial leadership, alignment of sustainability conception and strategies across the campus, comprehensive implementation of sustainability curriculum, etc., but because of its representative ideal, the literature is quick to specify that such central coordination should be enacted and balanced with the flourishing of bottom-up actions that ultimately work to decentralize and redistribute influence (Djordjevic & Cotton, 2011; Ferrer Balas et al., 2008; Purcell, 2019; Weiss et al., 2021) Thus, while the whole institution approach advocates for sweeping, "transformative" actions, it denies a centralized procedure. As Niedlich et al. (2020) suggests, "binding decisions should not be confused

with centralized, top-down decision-making" and "overarching coordination does not necessarily mean centralized control" (pp.7, 9).

Historicity and Present of Academic and Operational Governances

This underlying tension current to literature on a whole institution approach to sustainability—advocating for sweeping reform whilst attempting to bolster grassroots action—reflects the challenges in enacting sustainable change within a governance system that is increasingly dominated by a corporate model (Bieler & McKenzie, 2017; Bullen et al., 2010; Purcell et al., 2019). The corporate model, which rose in the 1980s through neoliberalizing activities and policies —the entanglement of knowledge with economic interests and motivations, decreased government funding for universities, etc—focuses on the commodification and marketization of university operations and tends to view decision-making power as concentrated at the level of administrative management in a top-down fashion (Bieler & McKenzie, 2017; Bleiklie & Kogan, 2007; Bullen et al., 2010). The grassroots-empowered governance which sustainability as a whole institution approach seeks to pursue bears more resemblance to a more collegial and representative types of governance. This collegial model, prominent until the mid-twentieth century, featured a senate at the centre of governance; the university could be interpreted as a "republic of scholars" who each pursued knowledge and truth for their intrinsic value (Bleiklie & Kogan, 2007; Rowlands, 2017). The 1960s and 1970s saw a short-lived attempt for a representative model of governance that was led by academics and provided students and staff the rights to contribute to institutional decisions (Bleiklie & Kogan, 2007). The 1980s neoliberal shift that subsequently led universities to prioritize economic factors, and thus increasingly prioritize the hierarchical model of administrative governance, is now often taken for granted, obscured by the normalization of everyday workings of the university and a lack of self-reflexivity on the history of university governance (Bansel & Davies, 2010; Blackmore, 2014; Rowland, 2017).

This element of normalization is present in much current literature on sustainability governance, which promotes bottom-up action but retains an ahistorical understanding and terminology of governance at universities. Generally, it is recognized that universities are complex institutions that house multiple types of organizations and cultures whose values often come into conflict with each other (Hoover & Harder, 2015; Leal Filho et al., 2020). Although the literature ostensibly emphasizes this awareness, governance is almost consistently presented in a manner that does not bring into awareness alternatives to its present realization. "Governance" tends to be associated with higher-level administrative staff within a corporate model of organization, such as the signing of international charters, the capacity for institutional entrepreneurialism, and central leadership and management (Baker & Shelley, 2017; Bieler & McKenzie, 2017; Mader, 2013; Sisto, 2020). The complexity of governance in university is discussed in relation to matters such as the diversity of academic disciplines or the complexity of sustainability as a concept—but distinctions between administrative governance of operations and academic governance are rarely brought to light (Djordjevic & Cotton, 2011; Leal Filho et al., 2020). One promising development is research conducted by Niedlich, Bauer, and other scholars on governance in German higher education institutions. Their research recognizes that "sustainability governance" is not developed equally between the domains of education, research, operations, and community engagement and thus confirms different identities of governance at universities Bauer et al, 2020; Niedlich et al., 2020; HOCHN 2019). However, their assessment tools for governance ultimately still integrate all these domains together, as part of their pursuit for a "whole institution approach" to sustainable development (Niedlich et al., 2020). Ultimately, these analytic

approaches reveal the existing potential to build on these very approaches as a means to research sustainability governances at universities more representatively and democratically.

METHODS

Our research incorporated two sets of comparative case studies of sustainability activities at a total of ten universities around the world, and was guided by a framework centred on modes and styles of sustainability governance at universities.

Framework Development

A literature review of sustainability in higher education helped determine the structure and content of our evaluative framework. Ultimately, the framework seeks to analyze each university's whole-institutional approach to sustainability by considering the sustainability initiatives across the four main university domains (education, research, operations, community engagement) from the basis of its sustainability governance (Table 1). By looking at the roles of the administration, staff and faculty (and to a limited extent, students), we aimed to analyze who and how the responsibility for sustainability governance is taken up (Holmberg, 2014; Omrcen et al., 2018). We also invited participating sustainability actors in our selected universities to contribute to the development of the framework, as a means to make it a collaborative, living document.

Figure 1. Evaluative Framework for Analysis of Sustainability Governance

Headings	**Breadth of Coverage**
General description of each university	- Type of university, its size by population and land area, operating budget, etc.
Sustainability governance at the University	- Identity (institutional mission, and definition of sustainability) - Actors (mandated principal actors, their bureaucratic position, and style of governance) - Formal commitments (investment, budget, research funding, networks, and ratings)
Sustainability activities in the four domains	- Education (sustainability curriculum, accessibility to students regardless of majors) - Research (sustainability research institutes, individual faculty champions, etc.) - Operations (GHG emissions reduction, green buildings, waste management, etc.) - Community engagement (involvement of the private/public sector in university initiatives)
Cross-cutting activities and partnerships for sustainability	- Research and teaching (transdisciplinary, disciplinary, and interdisciplinary initiatives) - Academics and operations (projects involving both faculty and operational staff, etc.) - Integrated engagement by the university community with external partners
Culture, communication, and outreach activities	- The extent to which sustainability is part of the institutional culture - Barriers to sustainability (cultural and/or institutional barriers, etc.) - Communication and outreach of sustainability initiatives

We anchored this overarching framework around the actors of sustainability governance, and thus strove to identify the principal actors, their bureaucratic position, and their style of governance. From this viewpoint, we evaluated the actors in terms of whether they focused on academic or operational sustainability issues, and as undertaking central coordination and/or distributed agency activity (Figure

2). Ultimately, this informed our analysis on the nature and substance of the four domains of university activities as related to sustainability, and as related to the style(s) of governance(s).

Figure 2. Definitions of Academic and Operational, Central Coordination and Distributed Agency

	Central Coordination	**Distributed Agency**
Academic Pertains to the governance applied to and/or by university's academic units, including faculties, departments, schools, and research institutes.	Need central coordination for there to be a university level sustainability response and strategy. There is an inherent tension with the normal distributed agency role and activities of academic actors	The normal operating mode of academic sustainability
Operational Pertains to the governance applied to and/or by university's operational facilities, including Estates, Offices, etc.	The normal operating mode of operational sustainability	Need distributed agency dimensions to engage faculty and students in a meaningful way. There is an inherent tension with the mandate and accountability of operational sustainability staff.

University Selection

The ten universities were selected on the basis of their sustainability leadership, regional coverage, and available contacts. The aim was to select a set of geographically distributed universities committed to sustainability transformations. To identify universities, rating systems such as the Sustainability Tracking, Assessment & Rating System (STARS) and the Times Higher Education's University Impact Rankings were used, and knowledgeable colleagues were consulted. A network of available contacts was used to engage with potential universities to include in this project. The first analysis was conducted in the summer of 2019 and included University of Edinburgh, University of Toronto, and University of Utrecht. The second analysis was conducted in the summer of 2020 and included Arizona State University, the Massachusetts Institute of Technology, University of British Columbia, University of Cape Town, University of Hong Kong, University of Monash, University of São Paulo, and also the University of Toronto.

Data Collection

The research design involved web-based research, and was followed by face-to-face virtual interviews with sustainability actors at the ten universities. In the web-based research component, university and other relevant websites were utilized to collect official, publicly-available information on sustainability activities and governance. This information, aligned with the framework, informed the case study for each university. Furthermore, to supplement and expand this research, individuals from multiple stakeholder categories were interviewed. Some interviewees fit in multiple categories due to the breadth of their roles, or the fact that they occupied more than one role within the university; in the cases where interviewees fit into multiple categories, they were included in the count for all categories.

The Utrecht and Edinburgh interviews were conducted in-person during the summer of 2019. They included interviewees included the following institutional roles:

- 8 members of senior management
- 11 cross-cutting sustainability coordinators
- 19 operations staff
- 7 academic administrators
- 8 faculty members
- 1 student group member

The ASU, HKU, MIT, Monash, USP, UCT, UBC and UofT interviews were conducted virtually during the summer of 2020, and included:

- 3 members of senior management
- 5 cross-cutting sustainability coordinators
- 9 operations staff
- 8 academic administrators
- 8 faculty members
- 1 student group member

Interviewees were recruited first through the network of sustainability actors, and then by referral from initial interviewees. All interviews were conducted by video call and accompanied by a recording and transcription, or notes.

FINDINGS AND ANALYSIS

Elucidation of the two governance processes

Academic sustainability governance

Across the universities in our case study, there exists a pattern on how governance on academic sustainability is typically structured. We observe that most have a component of distributed-agency, meaning that participation from faculty members cannot simply be mandated through a central directive, as this would not fit with the culture of academia. This long-standing culture emphasizes that individual faculty members have independence in determining their own research and teaching interests, with some degree of guidance and reinforcement provided by academic unit leads, but little direct influence from the university administration. Instead, the university as an institution can seek to influence and orient research projects by providing platforms which provide funding for certain strategic research initiatives, such as research or teaching on interdisciplinary sustainability issues.

We observe that while most academic governance platforms on sustainability focus on incentives for the targeted research participation of academics, the particular incentives do vary. At UBC, its UBC Sustainability Initiative (USI) supports faculty in collaborative projects by creating two funding programs – those for same-department faculty groups and those for groups from different departments – for sustainability research. The Environmental Solutions Initiative at MIT also offers a similar scheme, where cross-disciplinary collaborative research opens up the possibility for grants. Some platforms do not boast a direct funding opportunity, but provide research facilitation and support by their in-house staff, as is the case with the Monash Sustainable Development Institute (MSDI). At U of T, a new Institutional Strategic Initiative provides funding for creating highly

interdisciplinary teams of scholars, several focused on sustainability issues. With USP's Superintendence of Environmental Management (SGA) and U of T's Committee on the Environment, Climate Change, and Sustainability (CECCS), an added appeal exists for interested faculty members in that their project ideas, input, and expertise can be incorporated into landmark campus retrofits and new-builds, considering the two units' bureaucratic proximity to university leadership. At Utrecht, its Pathways to Sustainability (PtoS) program provides significant funding for large-scale sustainability research programs. This arrangement, to an extent, is also present in HKU's Centre for Civil Society and Governance (CCSG), where collaborative projects with regional governments and local stakeholders are first initiated by the Centre, with specific research portfolio recruitments conducted afterward through a Fellowship and Academy scheme. The vast majority of aforementioned platforms boasting a facilitation and supportive capacity for research projects also offer connections and outreach to external stakeholders within society to become partners in the faculty's projects, which would enable the scaling-up of the projects themselves and their impacts.

On the teaching side, academic sustainability platforms are observed to administer programs of study, Minors, sustainability 'pathways' and 'scholars' initiatives, or even have dedicated units tasked with innovating the curriculum. In MIT's case, the Environmental Sustainability Initiative has developed a Minor in environment and sustainability, while the MIT Energy Initiative administered an interdisciplinary Minor in energy studies. The School of Sustainability at ASU offers a similar function by administering sustainability-themed Minors and programs, while also having final approval on course proposals from faculty. The MSDI at Monash goes a step further by managing a sustainability-related Master's program jointly with several faculties. UBC and U of T are in a similar position in perceiving that the initiatives outlined thus far, including Minors and programs of study, may only attract engagement from students already pursuing studies in sustainability and not the wider student body. This rationale led UBC to develop a 'pathways' approach where the USI works collaboratively with faculties to embed sustainability in most undergraduate teaching programs, in addition to offering a sustainability 'scholars' program as a paid graduate research internship program. At U of T, work similar to UBC's USI is also underway through the teaching and learning subcommittee under the CECCS. However, the 'sustainability pathways' at U of T take on a different additional form in which all undergraduate students are offered the opportunity to obtain formal credit for curricular and co-curricular activities related to sustainability, allowing them one of three recognition levels – sustainability 'citizen' (designation on the co-curricular record), sustainability 'scholar' (designation on transcript), or sustainability 'leader' (both designations). This more universal approach is hoped to make sustainability teaching, activities and recognition more readily accessible to the wider student body.

The next important aspect of consideration is the positionality of these academic sustainability platforms. There are several aspects at play here, including the origins of the platforms themselves, background of the members and affiliates comprising it, and what reporting or accountability structures they possess. The latter is especially relevant in evaluating the potential for the academic realm to retain an environment of independence and bottom-up emphasis, or whether it is at risk of being controlled by corporate-administrative structures. Another key factor is whether the university has adopted a bicameral system, where the equivalent of a Governing Board handles the administrative and operational aspects of the university while a Senate has the say on academic affairs, or a unicameral system where the two are combined into a single body. In our study, we charted such lines of reporting structure of the academic sustainability platforms to these highest bodies whenever feasible, while also taking into account distinct advisory councils that they might have accountability to.

We found that several academic sustainability platforms in our study have either a reporting, accountability, advisory, or funding structure that implicated operational or administrative leaders. In terms of the integration of academic and operational governance towards the whole institution approach, these implications can be a positive sign of collaboration or a cautionary tale on amalgamation, particularly with the hierarchical presence of operational leadership and industry leaders in academic initiatives.

Some have operational leaders within their formal accountability structures. At UBC, the flagship UBC Sustainability Initiative (USI) was created by the Board of Governors, which forms its bicameral governance along with the Senate. The Initiative's Senior Director has a reporting structure which implicates the Board of Governors, while its Academic Director reports to the Provost and the Vice President Academic. A similarly branched leadership structure is observed at U of T, where the Committee on the Environment, Climate Change, and Sustainability (CECCS) is co-chaired by a leading sustainability academic and by the university's chief operating officer. As a committee, however, it reports to the President in his capacity on the administrative side of the house, and eventually reaches the university's unicameral Governing Council. At MIT, the Executive Committee of its Energy Initiative reports to both MIT's President and the Provost, which suggests a branched reporting structure as was previously observed for U of T and UBC. Utrecht's Pathways to Sustainability (PtoS) program echoes this administrative-oriented reporting structure. As one of the main pillars of the university's strategic plan, it is entirely funded by Utrecht's unicameral governing body, the Executive Board, which in turn reports to a Supervisory Board comprised of State Ministry appointees who are mostly industry professionals.

Others have operational- and administrative-oriented leaders within an advisory capacity. The prominent presence of industry and its professionals are also observed at Monash and MIT in their advisory councils. The Monash Sustainable Development Institute (MSDI) has a leadership team comprised of academics and reports to the Academic Board, its equivalent of the Senate. However, it also has an Advisory Council that, despite the inclusion of the Provost, is mostly industry leaders. On a similar note, the three Initiatives studied at MIT – the Energy Initiative, the Sloan Sustainability Initiative, and the Environmental Solutions Initiative – are all advised by industry to some degree, despite being initiated by an independent group of faculty members prior to receiving institutional support in the form of funding, staff, and a dedicated office. While the Environmental Solutions Initiative has distinct advisory councils for faculty members, students, and external industry professionals, and the Sloan Sustainability Initiative has a single advisory council made up of several industry professionals, the Energy Initiative would arguably have the most intriguing structure. Industry professionals are a part of its Governing Board and its External Advisory Board, while representatives from its corporate partners have a seat on the Executive Committee.

Overall, some patterns emerge as to how central-coordination and distributed-agency approaches take place in the academic side of universities. As a general rule, distributed-agency approaches are central to academic sustainability activities, as it is the voluntary participation and buy-in of faculty on sustainability teaching and research which make up academic sustainability work to begin with. In this sense, academic sustainability can be interpreted as being inherently bottom-up in nature. At the same time, we observe that most academic sustainability platforms incorporated within this case study contain a centrally-coordinated component as well. If this were not the case – that is, if most academic sustainability platforms were solely distributed-agency – it would be unlikely that we would be able to observe them as having a university-wide reach, nor would the university itself be able to express its position on sustainability issues or join inter-university networks. As a result, central-

coordination activities necessarily play some role in the academic sustainability framework.

Operational sustainability governance

Within the operational side, notions of central-coordination and distributed-agency were observed to take different forms than they do on the academic side. For starters, central-coordination within operations meant that upper management – typically the university's senior administration – set certain policies which are then carried out by operational offices as part of their mandate. In contrast to the academic side, no incentives or engagement campaigns are required on behalf of the senior administration to attract participation from operational actors, as the nature of their bureaucratic structures does not warrant such an approach. As well, a clear accountability structure between the operational sustainability units and senior administration meant that top-down action on policy can be more consistently enacted. Such policies included those on greenhouse gas (GHG) emissions, certain waste and water management plans, or overarching climate strategies – aspects which are measurable and can be operationalized. While there were operational sustainability units observed which conducted purely centrally-coordinated work, most cases had an extent of distributed-agency. Such distributed-agency within operations was observed to take on one of two possible forms – operational offices delegating engagement to operational projects from the wider university community, or strategic initiatives initiated by lower offices which then received a top-down endorsement, with the former being more often the case. These cultures, and how the two concepts manifest in operations, signal a departure from the culture observed previously within the academic side.

Because central-coordination within the operational side carries a clear bureaucratic structure, the senior administration has a larger capacity to direct operational sustainability initiatives. The senior administration of Monash is a relevant example here, as it has created and dissolved multiple working groups over the years – from an Environmental Policy Task Force committee in 2003, an Office of Environmental Sustainability and the Vice Chancellor's Environment Group in 2008, to the current 2015 mandate from the Vice Chancellor in the form of a working group. At Utrecht, the assignment of the Green Office as its primary sustainability actor was included in the university's Strategic Plan, which gives it a reporting structure linked to the Executive Board as Utrecht's apparent unicameral governing body. MIT's Office of Sustainability (MITOS) has a similarly powerful position as an operational sustainability actor, as it is situated under the Executive Vice President and Treasurer's Office. At UCT, having identified that sustainability efforts after its 1994 signing of the Talloires Declaration were largely fragmented and sporadic, a centralised replacement was then created under the Vice Chancellor portfolio. This new Directorate of Environmental Sustainability reports to the Council, which comprises university administrators as well as State and donor appointees. At U of T, three Sustainability Offices have been created at the three university campuses, and a Tri-Campus Sustainability Board coordinates those activities. All these bodies are accountable to senior administrative staff in the university, but are linked informally to the CECCS described above. Lastly is the case of Edinburgh's Department of Sustainability and Social Responsibility (DSRS), which as a part of the larger Corporate Services Group is already granted a considerable budget. The DSRS' reporting structure goes through an SRS Committee and to the University Executive.

An important note on positionality can be inferred here. All operational sustainability units incorporated within our study had a reporting and accountability structure which implicated actors in upper-management belonging to the operational or administrative side of universities. This observation meant that as a general rule, the same bureaucratic results-oriented culture which governed the work

of operational sustainability units was also the work culture of the actors to which they report to. While this observation might initially seem inconsequential, it presents a critical divergence with academia, where we previously found that academic sustainability platforms had accountability structures reaching operational or administrative actors, whose work were governed by operational cultures and principles. In other words, those tasked with sustainability on the operational side reported to actors with the same culture as their own, while several of those on the academic side largely did not.

We observed that most operational sustainability units – by their very nature – perform top-down action in accordance with their mandates, but many also have complementary bottom-up components through which they do work. At UBC, three operational units were observed to handle sustainability work, each being located within a different branch of operations. They were the Sustainability & Engineering unit located within the Campus Planning & Community group; the Finance & Operations unit located under the Facilities portfolio; and the general Sustainability Office. These operational sustainability units have mandated top-down portfolio, which is to deliver on the Climate Action Plan, Zero Waste Action Plan, and Water Action Plan, among others. The Sustainability & Engineering unit, however, also runs collaborative Campus as a Living Lab (CLL) projects and the SEED Fund to support sustainability projects, which are more bottom-up in nature as they also engage faculty and students within the projects. A similar bottom-up trait is observed with the MIT Office of Sustainability (MITOS) which, in adopting a framework that utilizes the MIT campus as a test-bed for innovation and knowledge creation through research and education, goes beyond an operational focus and engages faculty, students, and other staff to collaborate on Living Labs. For MITOS, such a bottom-up approach was complementary to its primarily top-down work on a GHG inventory and performing whole-institution scans – these were performed as part of their top-down mandate to deliver on MIT's Climate Action Plan and its GHG emissions targets. Another example is Utrecht's Green Office, which is tasked as the primary actor in accomplishing the university's GHG goals for 2030, which were set as a top-down Strategic Plan. The implementation for this top-down policy, once again, featured bottom-up elements, as they work with researchers on Living Labs and with students on behavioural change campaigns, among others. At U of T, the more bottom-up operational activities such as campus as a living lab project are managed through the CECCS, but operational staff from the three Sustainability offices are deeply involved as 'clients' for such projects.

Another way in which traits of distributed-agency were observed in operational sustainability were through the developmental stages of policy – some initiatives were first developed at lower offices and garnered significant traction and local success, which increased its appeal and were later adopted by the administration as a top-down policy. The first example of this is at HKU, where the Sustainability Unit initiated the Ditch Disposable campaign as a way to change behaviour regarding plastic use on campus. The campaign, which was initially carried out on a smaller scale and involved prominent early adopters, slowly became a success and was later adopted as an institution-wide policy. Another example where this was the case was at Monash. Its landmark initiative, Net Zero, started out as independent initiatives and proposals by a subset of individuals within the operational side, who advocated for their endorsement by the administration. Understanding their positionality, early adopters of Net Zero continued developing the initiative even before the endorsement, as they intended to have it ready as soon as it came. This approach later proved to be a good strategy on their part.

Importance of a tailored approach

Our study focused on two different types of actors on sustainability, located within different sides of the university – academic sustainability platforms and operational sustainability units. In naming these actors, our choice of language was intentional. The term 'units' was utilised for operational actors to account for the clear bureaucratic accountability structure through which operational sustainability work is performed. In other words, the reporting structures of these units can be more systematically traced, and their positionality within the organization clearer. On the other hand, 'platforms' were the chosen designation for academic actors, given that the clear bureaucratic positionality observed in operations largely did not exist. While we were able to interpret and understand the reporting structures of these actors on academic sustainability, they were largely positioned beyond the traditional faculty, department, or college systems.

Supplementing the previous sections where case studies were utilised to advance the side-specific analysis, this section will distill the overall findings into three themes which argue that a monolithic treatment for both sides would not be effective, hence the importance of a tailored approach. The first theme is descriptive, as it elaborates differences in cultural orientations and accountability structures present on each side – both will raise important considerations on the dynamics of collaboration and advancement. The second and third themes are more analytical, as they each take central-coordination and distributed-agency as the two distinct methods and elucidate differences in their manifestation and contributory value (necessity and sufficiency) within academic and operational sustainability

Divergence of culture and structures

Observing the cultural orientations and structures of operational and academic sustainability actors suggest a divergence, rendering an attempt which equates the two as problematic. This rationale influences how 'politics' is to be navigated on each side in an effort to push sustainability work, with implications for new implementers of sustainability. Operational units, by their nature, follow a top-down structure where policies are set by upper-management and carried out by relevant units positioned below them. This pattern means that there is a clear bureaucratic structure, with accountability across those structures involving a results-oriented model utilizing key performance indicators. Additionally, there is no need for management to provide incentives for buy-in to policies among staff, as the operational side does not orient work around a voluntary participation model. Such a model, on the other hand, is a longstanding trait of academia, where faculty are granted the independence to seek and carry out their own research and teaching work. It is highly difficult for any university administration to instruct or demand a change in this work, even if the shift intended is a positive one as with sustainability. Shaping this academic work, however, is possible through the creation of academic sustainability platforms which may facilitate collaboration between faculty and external partners for sustainability research while providing certain incentives to boost such activity.

As academic and operational sustainability face different reporting and accountability structures, any approach must take into account the ways in which policy, incentives, and work incorporation takes place within the sides. Operational sustainability units have structures in which they report to the university administration, often through the Presidential, Vice Presidential, or Vice Chancellor portfolios and reaching the university's appointed governing body – all portfolios which deal with the university's operational or administrative functions. The previous discussion on cultural orientations can be incorporated here, with the observation being that operational sustainability units report to portfolios which have the same cultural orientation as their own. This is not the case with

academic sustainability platforms, as they were observed to have a reporting, accountability, advisory, or funding structure that implicated actors on the operational side, as well as external industry professionals in some instances. In other words, sustainability work on the academic side – which upholds a principle of independence and work agency – often reports in part to actors which do not have the same cultural orientation. This mixing of cultures in the academic reporting structure can be interpreted as a positive sign for collaboration. However, it could also signal a governance system that is pushing academic sustainability towards becoming a more results-oriented operation, or which alienates academic participants.

Different manifestation of governance approaches

Given the accepted duality of central-coordination and distributed-agency as means for policy implementation, it is important for new implementers of sustainability to understand that the choice of methods is not an arbitrary one as each method does not apply equally to academia and operations. We emphasize not only that their significance – by virtue of necessity and sufficiency for success – varies between the two sides, but also that each method manifests differently depending on where they are situated. Within operational sustainability, central-coordination takes the form of strategic planning and policies set by the administration, which are then carried out by operational units. In delivering on these mandates, operational sustainability units were observed to also strategise engagement from the wider university community – this would include faculty and students for initiatives such as Living Labs and behavioural change campaigns, suggesting an element of distributed-agency. Alternatively, distributed-agency also takes place through the observation that some top-down policies set by the administration initially started out as independent initiatives of operational units, which then garnered a sizable success and was endorsed for a wider implementation by the administration. On the academic side, a direct link to distributed-agency can be made through the observation that such is predominantly the culture of academic work, which means that academic sustainability platforms have to engage and incentivise faculty as participation is largely voluntary. A more substantial divergence exists in how central-coordination applies to academia – in observing for signs of this trait, the typical directive model of operations cannot be expected as it simply does not fit with how academia is structured. Instead, the institutional support needed to establish and manage academic sustainability platforms can be inferred as signs of central-coordination, especially since platforms without such support may not likely be able to have the institution-wide reach that is observed in most of the case studies.

Necessity and sufficiency of approaches

In operational sustainability, central-coordination is necessary for successful work and moderately sufficient as well. Distributed-agency is neither necessary nor sufficient for successful work, but is crucial if students and faculty are to be involved in operational sustainability projects such as Living Labs. The rationale for this is that as operational sustainability units carry out both central-coordination and distributed-agency work as a way to deliver on their central-coordination mandates, they are still technically able to carry out and be successful in their central-coordination work even if the distributed-agency aspects of it – engagement with and buy-in from faculty and students – do not pan out. In this sense, their central-coordination work – energy optimization, water and waste management, and GHG emissions tracking, among others – can be successful even without wider

engagement. While such is the case, operational units limited to purely central-coordination work might not be able to deliver transformational sustainability, as the distributed-agency aspects of work are often encouraged lubricants for operational work to have a wider impact. As a result we do not consider central-coordination activities as sufficient for operational success.

On the other hand, in academic sustainability, distributed-agency is necessary but does not allow for commitments, partnerships and inter-university relationships to be created. In other words, to the extent that sustainability teaching and research is to be connected to the university's sustainability goals, there needs to be some connection to central-coordination – however, with the large body of academic work already conducted in a purely distributed-agency manner, some faculty might challenge the necessity of a central-coordination connection. Here, we observed that distributed-agency – that is, the engagement or work conducted by faculty – is an essential component of successful academic sustainability work. As the voluntary work of faculty accounts for all the work performed and new knowledge developed within a university's boundaries, there can be no academic sustainability without it. However, a more collaborative research infrastructure for faculty and other stakeholders can only be advanced if academic sustainability platforms receive institutional support through a central-coordination scheme. Hence, distributed-agency work alone might lead to disjointed efforts which are often unconnected to the institution's sustainability objectives. Furthermore, such drawbacks might be perpetuated by the critical orientation of some faculty toward university-wide sustainability efforts, given the involvement of administrations in them. As such is the case, sporadic work would be difficult to classify as successful academic sustainability advancement.

Assessed collectively, any institution developing new sustainability policies and programs would benefit from the insight that while a whole-institution approach is strongly championed by the literature and would understandably lead to a better embedding of sustainability throughout all facets of the institution, it should not be interpreted as endorsement of a blanket treatment for both academia and operations. The two sides present highly different characteristics, with cultural orientations and accountability structures chief among them, and it is important to understand how a tailored approach can better navigate each side in an effort to advance sustainability policy. On this note, we also acknowledge that weighing central-coordination and distributed-agency as means for policy implementation is often a challenging process. It is helpful to identify how each method would still take shape differently in academia and operations. In the end, a nuanced understanding of the different approaches required for academic and operational sustainability in the planning, execution, and progress tracking phases would help immensely for sustainability advancement.

Suggested principles for good governance

Through our analysis, we attempt to confirm and elucidate the distinctions between sustainability governance of the operational and academic sides of the university, as a means to form a better fundamental understanding of the diverse needs and reality for building a whole-institution approach to sustainability. In this concluding section of our analysis, we suggest principles that hopefully work towards the whole institution approach by considering and upholding the university's multi-governance reality and potential. These suggested principles, initially at 10 in count, were part of a report to the U of T President by the Chair of the President's Advisory Committee on the Environment, Climate Change, and Sustainability (CECCS), Professor John Robinson, based on his years of consultations and pioneering work. The following version was adapted to our research analysis and incorporated insights from sustainability actors at participating universities.

1. *Taking an enabling role to embed sustainability throughout the institution*

Recognition needs to be placed on the importance of a distributed-agency, 'enabling' role for academic sustainability platforms and operational sustainability units – as both are key players in this 'enabling' function, administrations must first create, fund, and support them. Giving responsibility to one centralised actor is likely neither successful nor enduring across changes in administrative priority – instead, the aim is to embed sustainability initiatives within the many offices and departments that make up the institution. Sustainability units and platforms would take the task of conceptualising various sustainability initiatives and kickstarting the process, but with eventual responsibility for program delivery transferred to those engaged actors. Considering how offices and departments have their own distinct priorities and might not have the resources to allocate toward devising sustainability initiatives on their own, especially if it is a significant departure from their existing portfolios, this initial support from sustainability platforms and units becomes a critical tipping point for actors to embrace sustainability objectives as a worthy endeavour. As sustainability initiatives become increasingly integrated into the portfolios of many offices and departments, continued support from sustainability units and platforms may still be provided but would no longer be a necessity for advancement.

2. *Creation of a collective and inclusive narrative on sustainability for the institution*

An institution-wide narrative on sustainability can be an effective tool in advancing sustainability work at universities. As sustainability objectives and definitions become included into strategic planning items, they open doors in terms of funding, support in incentive provision, or increased general facilitation for the units and platforms conducting such work. This is especially true for administrations embracing the 'enabling' role, as academic sustainability advancement is already being included as an item or even among the main pillars of several administrations' strategic planning. As academic sustainability becomes an institution-wide objective, this enables operations to be able to provide better support on top of existing operational support for academic initiatives, as such is now part of their central-coordination mandate. As well, given that some department-specific funding opportunities currently target only a specific subset of sustainability, a more comprehensive narrative at the institutional level could supplement such funding and intuitively include more projects as part of the university's sustainability research portfolio. Lastly, a comprehensive narrative can have external implications. Considering universities' sizable societal role, as institutions embrace a 'better' definition of sustainability, those fields previously excluded become more attractive avenues for existing government and industry partners to allocate funding to as part of their larger CSR agendas.

3. *Integration of academic and operational sustainability*

A 'whole-institution approach' has often been championed as it is believed to foster better coordination between the academic and operational sides to advance sustainability as a whole. However, it is important not to mistake this with a blanket approach, as the importance of recognising the key differences in approach necessary between the two cannot be understated. There currently exists numerous equivalency in reporting structures, where both academic and operational sustainability actors often report to the same administrative-operational leadership such as presidents and vice-presidents, chancellors, or the Governing Councils. In the long run, the absence of academic

actors at the top reporting structure may cause challenges for academic sustainability work, particularly on the engagement aspect for faculty and departments. To counteract this, several universities have already included reporting structures for such platforms which reach the Senate and Provost, both of which are academic portfolios. Still, the operational link should be kept, with several academic sustainability platforms having directors with a branched reporting system to both operational and academic leadership. A more promising method for integration might be through mandated collaborative working groups, where the balanced representation of operational and academic actors in its membership is also expressed through the joint leadership of a professor and operational manager – each understanding how best to spur engagement within their respective sides. There have been positive signs for this type of integration, where the occasional embrace of such a governance model at some universities is supplemented by the more widespread Living Labs, with its academic-operational collaborative nature and overall success as often a university's signature sustainability projects. Such integrative success also becomes part of the institution's presentable narrative of successful sustainability advancement.

4. *Leveraging community engagement for transdisciplinary research*

Active participation and funding are essential for sustainability advancement. A model which might address both are advisory councils made up of community members, which is already practiced by several operational sustainability units and academic sustainability platforms. Some initiatives have advisory councils composed of staff, students, as well as faculty, while others have industry, government and civil society representatives. The latter is especially innovative, as closer connections with society can facilitate better partnerships, real-world project application, and other forms of collaboration. With sustainability encompassing diverse disciplines and experiences, it is crucial that the field moves away from extractive modes of research to develop reciprocal and respectful relationships with non-academic partners, allowing knowledge co-production to take place and flourish at the university. These avenues serve as potential expansion points for sustainability work, not as replacements for an institution's 'enabling' role in creating and disseminating sustainability units and platforms – despite this, the presence of institutional facilitation might help such units and platforms achieve heightened societal engagement. However, attention needs to still be placed on the different cultures between academia and society, and the compatibility of their sustained collaboration.

5. *More work needed to embed sustainability across university curricula*

A sustainability curriculum can take on various forms – general sustainability courses, full programs and degrees, voluntary sustainability curricular patterns, and others. Past efforts have been made to introduce a mandatory introductory sustainability course for all students, but this has often proven counter-productive, given student resistance to required courses. Instead, a new approach has been to curate a curriculum based on voluntary participation, which is accessible regardless of a student's program. Given the breadth of fields which make up sustainability – likely further influenced by the institution's narrative on sustainability – such a model would be ideal to implement and fit into existing interdisciplinary and transdisciplinary structures. As well, sustainability curriculum does not need to be an institution-wide undertaking, as universities with their distinct college or campus systems may be best suited to implement a tailored approach. Similarly, a promising curriculum innovation has come in moving away from a single threshold-based certification system and towards a

multi-tier certificate in awarding students with their sustainability learning, which rewards various levels of engagement with sustainability content.

Appendix 7 - 17 Zoom Rooms@U of T Report

17 Zoom Rooms @ UofT

Summary report

SDGs @ U of T Virtual Events

December 4 and 11, 2020

On December 4 and 11, 2020, the University of Toronto hosted two events to catalyze deepened faculty and graduate student engagement in the Sustainable Development Goals.

Both had as their goal to foster a multidisciplinary, energizing, discussion of the United Nation's Sustainable Development Goals (SDGs), and how the university community should contribute to advancing the SDGs by identifying high- impact actions that can be taken over the coming 12-18 months.

Co-sponsored by the Offices of the Vice President International and of the Vice President Research and Innovation, the events were developed with expert input from an Advisory Committee (see Appendix 3).

The December 4th "17 (Zoom) Rooms" event was modelled on a format developed by the Brookings Institution and the Rockefeller Foundation to stimulate innovative forms of collective action aimed at advancing the SDGs. As Brookings notes on their website: "As a unique format for bringing diverse constituencies together around a common premise, 17 Rooms encourages participants to identify priorities within their own realm of SDG focus while also learning about priorities in other SDG domains."

The December 11th event, co-designed by the President's Advisory Committee on the Environment, Climate Change, and Sustainability (CECCS) and the Advisory Committee, built on the output from the first day, and was designed around six cross-cutting themes, drawing on the a framework developed by Sachs et al., 2019, which provides a way to cluster the SDGs in a meaningful and practical manner for operationalization. The six clusters were:

1. Education, Gender & Inequality
2. Health, Wellbeing & Demography
3. Energy Decarbonization & Sustainable Industry
4. Sustainable Food, Land, Water & Oceans
5. Sustainable Cities & Communities
6. Digital Revolution for Sustainable Development

The focus of the discussions on Dec 11 were, as with the first day, to generate proposals for multi- / inter-disciplinary research projects, community engagement activities to advance the transformations, and/or courses on how these transformations can be internalized at U of T.

Overview of 17 Rooms @ UofT event, December 4

The first event was attended by 113 faculty and graduate students from 27 different disciplines. It began with a welcome and opened with remarks from President Meric Gertler, who highlighted the importance of sustainable development considerations, which have been incorporated into a vast array of university projects. These initiatives range from the creation of a Presidential Advisor and Committee on climate change and sustainability to the complex urban challenges examined by U of T's School of Cities to the equity and inclusion work with Indigenous communities and campus revitalization efforts.

The opening panel featured Professor Angela Owusu-Ansah, Provost of Ashesi University; John McArthur, Director of the Center for Sustainable Development at the Brookings Institution; and Queen's University Professor Margaret Biggs, who is also the former president of the Canadian International Development Agency. The panel highlighted key themes regarding the role that higher education institutions can play in relation to SDGs in Canada and Globally. As hubs of intergenerational collaboration universities can work with the next generation to address SDGs. And since Canada is not on pace to meet its SDG targets, universities can contribute to progress on these by sharing relevant research and outreach with politicians and communities, to both think globally and act locally. By modelling the SDGs, through student funding, training, and research, universities can not only contribute to meeting SDG targets, but also contribute to reconciliation and other institutional equity goals.

Following the plenary panel and discussion, fourteen "rooms" (several rooms were combined due to, hence the smaller number) discussed many similar ideas on research, teaching, and partnerships. Cutting across all three of those areas was a desire to engage students and youth, as well as local, national, and global communities in the design and implementation of any research, teaching, or partnerships through avenues like community-engaged research or learning or participatory-action research. Intersectionality, decolonization, and equity-focused approaches were also consistently raised in relation to research, teaching, and partnerships.

Overview of Cross-Cutting Themes session, December 11

The second event was attended by 112 faculty and graduate students. Professor John Robinson opened the session with a recap of the first session held on Dec. 4.

Professor Robinson then announced the objectives of the cross-cutting theme session: Build upon the outputs of the Dec. 4 session, and review ways to merge and further develop proposals for one or more of the six Transformations, if they make sense, or create new interdisciplinary proposals. If the 17 SDGs represent a vertical approach to setting goals and measuring performance, the cross-cutting themes or clustering of SDGs by theme would be a horizontal approach to bringing out synergies among the SDGs. The Sachs' paper on the Six Transformations or clusters tag each Transformation with multiple SDGs, some with all 17 SDGs. However, for this session, each Transformation table had only 4 or 5 associated SDGs because there was a need to avoid having some Transformation tables being extremely large and others very small.

The session proceeded to hold two collaborative breakouts, first one titled "Six Transformations to Achieve the SDGs @UofT Research" and the second one similarly structured but focused on SDGs @UofT Teaching. At the closing plenary, each faculty moderator for each of the six Transformation tables gave a brief presentation of the discussion outcomes. Professor Joe Wong, Vice President, International closed the two-day event with forward-looking remarks on building on our existing research initiatives, forming new interdisciplinary and global partnerships, and producing a map for advancing the UN SDGs at U of T.

Key ideas

From Dec. 4 Session

The fourteen groups in the first session and the six groups in the second session differed in approach and substance during their brea-kout discussions, ranging from a focus on pedagogy and research methodology in some, on specific courses and research projects in others, and a discussion of opportunities and resources in most.

For many participants, the 17 Rooms held on December 4 was an awakening to the 17 SDGs and to the opportunities to work with colleagues from many parts of the university. A sense of community was driven by a spirit of collaboration and shared purpose across goals, with a shared sense of the need for urgent change and transformation.

Key themes and ideas from Dec 4 on which there was convergence are listed below:

Teaching:

A major recurring theme was around creating and adapting courses and other learning experiences related to sustainability. Some of the proposed courses include capstone projects, potentially with community-review processes in the course or an emphasis on case studies. Further, rather than developing new courses on SDGs, many participants pointed out the benefits of integrating SDGs into existing courses and introducing PhD cross-supervision to encourage a multidisciplinary approach to the SDG framework. Outside of the classroom, an SDG co-curricular program or an SDG hack-a-thon could provide students with unique opportunities to gain experience in the field of sustainability. Overall, employing a multidisciplinary approach to teaching was highly emphasized, along with creating opportunities for experiential learning both in program development and through funding.

Methods:

Prioritizing experiential learning, such as work-integrated programs or internships, was a key theme carried throughout the session. Additional ideas brought forward include engaging students in the development of their courses and team-teaching to bring multidisciplinary perspectives to SDGs.

Resources:

Resources that could contribute to the aforementioned goals include general tools such as the SDG competency or global competency framework, and systems such as teaching teams to contribute to interdisciplinarity. Further, experts in the field could be better utilized in residence and to support professional development.

Research:

Interdisciplinary Actions:

As interdisciplinarity was a prominent theme throughout this event, as well as in the field of sustainability, it is important to pursue this goal through connecting various fields of study to the SDG framework. Further, discussion was held regarding establishing a problem database that connects to faculty, librarians, trainees, and staff profiles to make it easier to form interdisciplinary teams.

Methods:
Potential methods to be applied to research include community based participatory research, intersectional approaches, and digital storytelling for knowledge mobilization. In this process, it is also important to reconsider who constitutes a research team in order to allow for the inclusions of non-academic stakeholders.

Resources:
Resources to be employed or developed include tools such as an open-access e-portal or database where faculty, student and staff can find one another and encourage groups/teams to form. Additionally, it could be useful to factor SDGs into faculty assessments for promotions as well as increase professional development for faculty and trainees. This professional development could cover topics including knowledge mobilization /translation and connecting research to monitoring and evaluating SDGs.

Partnerships:

Important partnerships to consider fall into four broad categories: (i) intra-university partnerships such as the Robert Gillepsie Academic Skills Centre at UTM, Centre for Teaching Support & Innovation at UTSG, Centre for Teaching & Learning at UTSC; Student Affairs, and OISE; (ii) other universities who are orienting their strategy and international engagement around SDGs, such as Ashesi University in Ghana; (iii) public or private NGOs such as the WHO, UNDP/UN Agencies, school boards, and municipal governments; and (iv) networks, groups, and associations such as the Sustainable Development Solutions Network.

Other areas for action:

Other identified areas for potential action include providing funding opportunities to students from lower income backgrounds, ensuring all students have the opportunity to enter entrepreneurship courses, interweaving students' learning outcomes with making communities better, and implementing practices of gender equity at all levels.

From Dec. 11 Session

Key themes and ideas from December 11 on which there was convergence are as follows:

Teaching:

Interdisciplinary Actions:

A key theme on teaching from the cross-cutting theme session focused on expanding collaborative specializations and building opportunities to co-teach between disciplines. As a proactive and very intentional effort to integrate concepts across programs and curricula, there is an opportunity to build an interdisciplinary teaching program. There were discussions on the development of a university-wide course on SDGs at the undergraduate level that cuts across all three campuses of the university, as well as an approach to embed it within each division. This would support the goal of ensuring widespread faculty and student awareness on the SDGs.

With any teaching, it is crucial that there is a strong emphasis on student engagement. Key steps in achieving that engagement include exploring the co-curricular space at the university and pushing for more opportunities for SDG engagement. In doing this, there are also opportunities to increase experiential learning and a deeper engagement with the broader community.

Methods:
Support for more experiential learning and large-scale, cross-disciplinary projects was heard repeatedly. Offering a first-year course, as well as a translational course for each discipline, on the SDGs would help students engage with the material, as well as support first-year students as they make decisions regarding their degree.

Resources:
Resources mentioned at the event include MITACS, SSHRC Healthy Cities, Queen Elizabeth Scholars funding, Learning & Education Advancement Fund (LEAF) to support funding, and the Centre for Community Partnerships (CCP) at U of T to provide expertise.

Research:

Interdisciplinary Actions:

Some key actions related to research that came out of the session include building cross-departmental alliances to construct interdisciplinary, holistic research. This could be supported through a "matchmaking" application program that introduces students and faculty to other researchers. Nevertheless, as research that is too wide-ranging can be counterproductive, it is also important to focus on actionable and target-based research as well. Further, teaching research tools, analytics, and ethics to all students would support the development of research standards that intertwine ethics and sustainability. This education for students would be best paired with opportunities for experiential learning in the local community. Finally, more focus should be given to ethnographic and field studies for greater attention to diversity and equity.

Methods:
The discussions varied from broader ideas such as developing community relationships to specific methods such as developing funds for interdisciplinary research, for assistant professors to mentor

graduate students, and for community partners. This could be supported through creating a unified data-portal for research, grants and opportunities.

To better facilitate the sharing of information and interdisciplinary research ventures, an inventory of existing multi-sectoral research on SDGs is needed, as well as a matching tool to link researchers in different disciplines.

Resources:
The identified resources fall under two broad categories: resources for expertise and resources for funding. Examples of resources for expertise include Academic Alliances, School of Cities, and CIty of Toronto partners. Examples of resources for funding are Social Sciences and Humanities Research Council (SSHRC), Seed funding for interdisciplinary research, and Community Foundations Canada.

At a higher level, both sessions highlighted the following recurring themes:

Partnerships:

A common theme carried throughout the event was prioritizing partnerships within UofT, within Canada, and internationally to work towards the co-production of knowledge. One useful step in furthering these partnerships is creating funds for work on interdisciplinary projects as well as any work done with community partners. Further, within UofT, there needs to be a greater emphasis placed on the importance of generating full-university interest in SDGs to develop a synergistic top-down and bottom-up governance approach. In doing so, co-curricular activities and opportunities for student partnerships can be expanded to further drive student engagement.

Conclusion

Overall, there were several recurring themes between the two events, most notably, calls for greater interdisciplinarity and multidisciplinarity in both teaching and research. This can be encouraged through offering seed funding for collaborative teaching and research methods, as another major theme was removing barriers through funding. This can include funding as incentive for sustainability related projects or funding for lower income students to provide greater academic opportunities.

Prioritizing experiential learning was also repeatedly discussed throughout the events, through co-curricular opportunities or joint projects with the community. The latter would also further the goal of better integrating U of T with the wider community through engaging with community partners, as well as global academic partners. In doing this, the university will be better able to prioritise working with students and the community in the co-production of knowledge, rather than for students and communities. Consequently, there will be a useful shift in focus from the work that is produced to the approach UofT takes in producing this work. Building transdisciplinary partnerships between academic and non-academic partners in the community was a key theme, recurring throughout the event.

Some immediate next steps were developed following the December events.

Connaught Global Challenge Research Impact Program

A first tangible outcome was to include a focus on the SDGs in the Connaught Global Challenge Research Impact Program funding competition, jointly offered by the University's Research and Innovation Office and by the International Office, which was launched soon after the SDG@UofT events took place. Several SDG specific calls for proposals in partnership with other universities have also been issued by the Office of the Vice President International in 2021, with several more planned.

CECCS

The Committee on the Environment, Climate Change, and Sustainability (CECCS) led by Professor John Robinson, and Ron Saporta, the CHief Operating Officer of U of T, is mandated to advance coordination of the University's contributions and objectives on climate change and sustainability pertaining to research and innovation, academic programs, community engagement, and sustainability initiatives related to our operations. .SDGs is one of the Committee's cross-cutting themes as they continue to integrate the SDG framework into teaching and learning, research, operations, and engagement and partnerships at the University.

A broader engagement strategy with staff across the university has also been discussed, and will be a focus for 2022.

SDGs ISI

A sustained focus on the SDGs and a commitment to contributing to progress on the SDGs which was a clear message resulting from the SDGs @ UofT December 4 and 11 event. With strong support from University leadership, including Deans as well as the Office of the Vice President International and of Research and Innovation, there was agreement to launch an SDG focused International Strategic Initiative. Co-Chaired by Professor Erica di Ruggiero from DLSPH and Professor Marc Cadotte from UTSC, a Steering Committee of faculty members and a Student Committee have been jointly tasked with scoping this initiative over the coming year, starting in September 2021.

Appendices

Appendix 1: SDG @ U of T Agenda - December 4

17 Zoom Rooms @ UofT

December 4, 2020
1:00pm – 4:00pm EST

About the Session

Universities are said to have two roles: one is to serve the existing society, and the other is to challenge society to shape a better future. The 17 sustainable development goals (SDGs) and the 2030 Agenda for Sustainable Development underline a set of challenges paramount for universities to address.

We welcome you to join a virtual collaboration session to **identify opportunities that will advance the SDGs @ UofT through our academic work: teaching and research.**

Timing	Item	Location
1:00pm – 4:00pm	**Session Welcome** • Opening Remarks & Session Orientation **SDGs @ UofT Panel** • Moderated discussion with our colleagues Angela Owusu-Ansah, John McArthur, and Margaret Biggs. **Collaboration Breakout 1 – SDGs @ UofT Research** • Facilitated Group Discussion **Plenary** • Virtual Gallery Walk • Research opportunities and ideas **Collaboration Breakout 2 – SDGs @ UofT Teaching** • Facilitated Group Discussion **Plenary** • Virtual Gallery Walk • Teaching opportunities and ideas **Session Close** • Summary Insights & Closing Remarks	**Zoom Video Conferencing**

Appendix 2: SDG @ U of T Agenda - December 11

Cross-Cutting SDG Themes Session @ UofT

December 11, 2020
1:00pm – 3:00pm EST

About the Session

Based on the 'Six Transformations' cross-cutting SDG framework (Sachs et al., 2019), which provides a way to cluster the SDGs in a meaningful and practical manner for operationalization, the session activities are designed to generate proposals for multidisciplinary or interdisciplinary research projects and courses on how these Transformations can be internalized at U of T, with linkage to local or international partnerships.

Timing	Item	Location
1:00pm – 3:00pm	**Session Welcome** **Recap of Dec. 4 Session** **Session Objectives**	Zoom Video Conferencing
	Collaboration Breakout 3 – Six Transformations to Achieve the SDGs @ UofT Research • Facilitated Group Discussion	
	Collaboration Breakout 4 – Six Transformations to Achieve the SDGs @ UofT Teaching • Facilitated Group Discussion	
	Plenary • Sharing of ideas by each Table	
	Session Close • Summary Insights & Closing Remarks	

Appendix 3: List of Recurring Themes and Ideas from Dec. 11 Session

Teaching

- Build opportunities to co-author and co-teach with cross-disciplinary streams
- Examples of collaborative teaching include Dalla Lana, Munk, and Engineering
- Promote flexibility at departments around workload and joint workforce
- Expand Collaborative Specializations
- Co-curricular space is suitable to provide collaborative SDG engagement for undergraduates – push University to create more opportunities
- Build an interdisciplinary teaching program around the entire "chain" approach e.g. the food chain, poverty (economics, sociology, policy, associated health challenges). Some examples of existing – Munk course on Covid19, collaboration between Rotman, Political Science, Engineering, and Global health for collaborative specialization in Global Health
- Proactively and very intentionally integrate concepts across programs and curriculums
- Promote capstone projects including humanities
- Encourage graduate students from very different disciplines to take these multidisciplinary capstones (e.g. Urban Pilot Lab – School of Cities)
- A university-wide course on SDGs at the undergraduate level - devise platform that cuts across the university across three campuses
- Scale / replicate successful interdisciplinary models (e.g. Trinity, UTM at graduate, School of the Environment, Engineering, Daniels) and expand to do interdisciplinary work across divisions
- A student-focused sustainability conference that has students sharing their learning & research on sustainability across faculties & programs

Methods

- Encourage experiential learning with international course module – make funding more widely available for experiential learning
- Cross-disciplinary, vertical systems approach with high schools and elementary
- International collaboration & creativity in entrepreneurship – becoming aware of other institutions: global-cross-disciplinary teaching internationally
- Faculty meetings are an opportunity to educate and sensitize faculty to SDGs
- Create a well-funded institute for cross-cutting transdisciplinary research
- Promote large scale projects that can involve students from diverse disciplines and backgrounds
- Repository of internal specialists to support SDG integration into education
- Selection/design of a platform for online video seminars, both internal and public
- A first-year course to provide students with a high-level framework they can use to support their decision making with courses, majors/minors, certificates, career, and other personal ventures
- A "translational" course for each discipline, or as necessary, that would summarize the unique fundamentals of their field so that non-specialists can better engage with the material.

Research

- Build cross-departmental alliances to construct interdisciplinary research
- Experiential learning in the local community – they are eager contributors to the education system
- Teach research tools, analytics, and ethics, to all students to support interdisciplinary future - e.g. Data Science Institute will teach interdisciplinary courses on data science
- Need to invest into "physical spaces" (on the model of the School of the Environment or the School of Cities for example) dedicated to transdisciplinary research on sustainability and decarbonization, hubs or network of networks.
- Support / join Communities of Practice to connect academics and non-academics
- Catalyze evidence based knowledge around SDG-led transformations (e.g. "Cochrane Review" in health)

Methods

- Develop seed funding for interdisciplinary research
- Build genuine community relationships outside of the classroom
- Focus on training and supporting early career professionals
- Funding for assistant professors to mentor grad students
- Coordinate data access/other costs across multiple research projects with similar themes for economies of scale
- Research office could help partner academics focused on similar SDGs for grant opportunities
- Inventory of existing multi-sectoral research on SDGs is needed
- Matching tool to link researchers in different disciplines is needed
- Creating funds for community partners
- Value interdisciplinary work in tenure and promotion criteria
- Publish nascent work -find ways to connect with faculty already working in that area

Appendix 4: SDG @ U of T Advisory Committee

Ayako Ariga, Secretariat & Project Manager, Committee on the Environment, Climate Change, and Sustainability

Professor Margaret Biggs, Matthews Fellow in Global Public Policy School of Policy Studies, Queen's University; visiting Fellow at the Munk School in 2019-20. Former President of the Canadian International Development Agency (CIDA) from 2008-2013

Professor Shauna Brail, Associate Professor at the Institute for Management & Innovation, University of Toronto Mississauga

Gwen Burrows, Executive Director, International in the Office of the Vice President International

Professor Erica Di Ruggiero, Associate Professor in the Division of Social and Behaviour Health Science, and in the Institute of Health Policy Management and Evaluation in the Dalla Lana School of Public Health. Director of the Centre for Global Health

Professor Vivek Goel, (former) Vice President Research and Innovation

Helen Lathiotakis, Executive Director, Research and Strategic Initiatives, Office of the Vice President Research and Innovation

Professor Anita McGahan, University Professor, Professor at the Munk School of Global Affairs & Public Policy, and a Professor of Strategic Management at the Rotman School of Management

Simon Pratt, Director, Research Strategy and Excellence, Office of the Vice President Research and Innovation

Elisabeth Rees-Johnstone, Executive Director, Continuing and Professional Learning at the Ontario Institute for Studies of Education (OISE)

Professor John Robinson, Professor at the Munk School of Global Affairs and Public Policy, and the School of the Environment, at the University of Toronto and Presidential Advisor on the Environment, Climate Change and Sustainability

Professor Joseph Wong, Vice President International and Professor of Political Science, Munk School of Global Affairs & Public Policy

Appendix 8 - Co-Chairs presentations *(Nov.2020 - Nov.2021)*

8.1: John Robinson's presentations related to CECCS activities

- 2021 U7+ Meeting of the Presidents: U7+ Commitments to Climate, Oct 25, 2021

- Ma, G., Alhakim, A., and Robinson, J., "Creating Change: Sustainability Governance at 10 Universities Around the World", Presentation at AASHE Global Conference on Sustainability in Higher Education, Oct 13, 2021

- Robinson, J., "Experiential Learning and Living Labs for Sustainability", Presentation to Special Interest Group Workshop on Community Engaged Learning and Living Labs, Utrecht University, Oct 13, 2021

- Robinson, J., "Sustainability Governance Principles at Universities", Presentation to Virtual Global Climate 2021, online conference sponsored by the Alliance for Sustainability Leadership in Education (EAUC) and the UN Environment Program (UNEP), July 8, 2021

- Robinson, J., "Inter- and Transdisciplinarity," Online Presentation to Panel on Fostering and Supporting Interdisciplinarity and Transdisciplinarity, U7+ Alliance Workshop on Principle 3, Action 1, University of Toronto, Jun 29, 2021

- Robinson, J., "Sustainability Inventories", Online Presentation to Panel on Fostering and Supporting Interdisciplinarity and Transdisciplinarity, U7+ Alliance Workshop on Principle 3, Action 1, University of Toronto, Jun 29, 2021

- Robinson, J. "Combining Forces: some thoughts on university/city partnerships", Keynote presentation at "University-City Collaborations on Climate Action: Best Practices" webinar, May 26 2021

- Robinson, J., "Regenerative Sustainability", Presentation at Trinity College Sustainability meeting, Mar 22, 2021

- Robinson, J., "Sustainability Inventories and Pathways", Presentation at U7+ Meeting on Principle 3 Action 1, University of Toronto, Feb 25, 2021

- Robinson, J., "CECCS and Sustainability at U of T", presentation to Simcoe Hall VPs, University of Toronto, Dec 2, 2020

- Robinson, J. "Report to President on Addressing U of T's Business-Related Scope 3 Travel Emissions", Adams Sustainability Celebration, Session on Post-COVID Travel and CECCS' Business Air Travel Report, Nov 3, 2020

Online Blogs, Podcasts, Webinars, Lectures and other contributions
(Nov.2020 - Nov.2021)

- John Robinson, "Combining Forces: some thoughts on university/city partnerships", Keynote presentation at "University-City Collaborations on Climate Action: Best Practices" webinar, ISC 2021 Summer School: Cognition and Climate, May 26 2021 https://www.youtube.com/watch?v=wb6KmK3jULA&list=PLTJcZPOXChRQtPNgBMYMS9h-R-nRfzKi5&index=12

- John Robinson, "Five Metaphors for Steering Sustainability", STRINGS project blog, May 12, 2021, http://strings.org.uk/five-metaphors-for-steering-institutional-change/

- John Robinson, "Fostering Sustainability Leaders", contribution to the GTI Forum *The Pedagogy of Transition: Educating for the Future We Want*, Great Transition Initiative, May 2021 https://greattransition.org/gti-forum/education-sustainability-robinson

- John Robinson, "Regenerative Sustainability", invited lecture in ENV100, Mar 30, 2021, https://play.library.utoronto.ca/play/69a44d4fc85421e55f64d4f5ecf3c3d9

- John Robinson, "Sustainability at U of T: Living Labs and Agent of Change", Presentation to Second Nature Webinar *Leading the Way: Global Universities as Living Labs and Agents of Change for Climate Action & Sustainability*, Nov 19, 2020; on YouTube at https://www.youtube.com/watch?v=6ILfjcNiG1o (20:20 – 44:40)

Media Coverage

- Jennifer Lewington, "Testing grounds for sustainability" Corporate Knights, Feb 17, 2021 https://www.corporateknights.com/channels/education/testing-grounds-for-sustainability-16135710/

- Geoffrey Vendeville, "With new appointments, U of T deepens commitment to sustainability goals", U of T News, Feb 2, 2021 https://www.utoronto.ca/news/new-appointments-u-t-deepens-commitment-sustainability-goals

- Rahul Kalvapalle, "'Waste-to-wardrobe' startup wins U of T's top Adams Sustainability Innovation Prize", *U of T News,* Jan 25, 2021 https://www.utoronto.ca/news/waste-wardrobe-startup-wins-u-t-s-top-adams-sustainability-innovation-prize

8.2: Ron's presentations related to CECCS activities

- Elevate 2021 Conference – Oct 13, 2021. "Impact Spotlight: Entrepreneurship for a Sustainable Future Session**".** Think 20https://www.think2030.com/en/#agenda30

- P3 2021, The Canadian Council for Public-Private Partnerships' annual conference - Nov 17,2021 "District Energy: Challenges and Opportunities" P3 2021 Annual Conference (p3-2021https://www.p3-2021.ca/Programme/Program.ca)

Appendix 9 – A CECCS White Paper:

Implications of appointed actors' academic-operational positioning on prioritised domains for sustainability work: Insights from three universities in Europe and North America

Authors: Nicolas Côté, Rutu Patel
Editors: John Robinson, Andi Darell Alhakim, Grace Ma

ABSTRACT

Universities act through four domains of activity: education, research, community engagement, and campus operations. Drawing from mixed-method, qualitative case studies conducted in 2019 of the University of Edinburgh, Utrecht University, and the University of Toronto, we question how the position of mandated sustainability actors within the institutional hierarchy influences the prioritization of certain domains of activity in the university's sustainability advancement. On this question, the case studies produce three substantive findings. First, when sustainability leadership is situated within operations but also engages academic actors, the university's academic sustainability initiatives can have greater access to concrete platforms to scale-up its impact. Second, when separate sustainability leaderships exist in both the academic and operational sides, initiatives in each side will be well-developed but may lack integration. Third, when sustainability leadership is situated outside of both hierarchies, the university can better bridge the academic-operational divide and are more integrative in nature. Thus, the position of mandated actors affected the development of certain domains, specifically those of education, research, and campus operations. On the other hand, development of the community engagement domain had less of a correlation with this positioning, as it is typically an extension of the impact of initiatives in other domains. Finally, integrative projects are important as they have the potential to tie less-developed domains with more-developed ones, creating a synergy in the university's whole-institution approach to sustainability advancement.

1. INTRODUCTION

Universities and their community of students, researchers, and graduates are key producers of sustainability knowledge in the global effort against the climate crisis and for the advancement of the United Nations' Sustainable Development Goals (SDGs). As such, they are under growing pressure—from climate-concerned students and staff, and external actors who expect these institutions to be leaders in sustainability action—to demonstrate their commitment to the knowledge they produce (Gudz 2004; Sipos et al. 2008; McMillin & Dyball 2009; Hugé et al. 2016; Finnveden 2019; Talloires

Declaration 1990). This pressure has led universities to expand institutional commitments to sustainability over the past 30 years. This growing institutional interest has led to the emergence of scholarship on Sustainability in Higher Education (SHE) (Wright, 2010; Barlett & Chase 2013; Leal Filho 2019). Hundreds of scholarly works have been written on best practices in sustainability education (Salonen 2018; Franco et al. 2019), sustainability research (Fien 2002), greener campuses (Amaral et al. 2020), or the impacts that institutional culture, governance structure and particular policies have on the implementation of sustainability objectives (Menon & Shuresh 2020).

These sustainability commitments are categorized by Bauer et al. (2020) across four domains of activity: education, research, community engagement, and campus operations in the context of their "roles in society" (Trencher et al., 2014). Although important sustainability projects can exist at the intersections of these domains, the ways in which these projects occur and are combined in pursuit of sustainability goals depend on the hierarchical boundaries, regional and historical context, and most importantly, the governance structure of these institutions (Purcell et al., 2019). Drawing from 2019 case studies of the University of Edinburgh, Utrecht University, and the University of Toronto, we outline a framework to answer the question: how does the academic and/or operational positioning of sustainability actors within the institution influence the prioritization of certain domains over others in the advancement of sustainability at the university? The purpose of this white paper is twofold. We seek to help the upper management and staff at universities understand the benefits and challenges according to the positioning of sustainability actors or centres within their institution's hierarchical structure. Additionally, we hope to provide "Sustainability in Higher Education" (SHE) academics with additional insight on recent developments of sustainability in universities.

2. THEORETICAL BACKGROUND

As Bauer et al. (2020) note, definitions of sustainability are multiple and 'rhetorically malleable' in the SHE context. In keeping with the United Nations' Sustainable Development Goals, this paper adopts a vision that goes beyond environmental sustainability to include social and economic sustainability, in addition to a commitment to procedural sustainability, which recognises the need for redefinition, learning and adaptation of the concept of sustainability to changing conditions (Robinson 2004; Fisher & Rucki 2016, 269) and is therefore rooted in an "experience in collaborative planning for sustainable community development" (Robinson & Cole 2015, 135).

Since universities are understood to contribute to society via the four 'fields of activity' or four 'domains'—education, research, community engagement and campus operations (Bauer et al. 2020; Menon and Shuresh 2020)—to make an institution sustainable has multiple meanings in practice, reaching far beyond the historically dominant environmental focus on greenhouse gas emission reduction. At universities, sustainability is found in the commitments, projects and initiatives operationalized by the institution within the four domains, and address a broad range of environmental and human dimensions.

2.1 Integration of the University's Four Domains in Sustainability Initiatives

Although universities act via the four domains, not all activities occur within siloes. Therefore, four domains are insufficient for encompassing the full range of sustainability activities at universities. Sustainability projects that work at the intersection of more than one field of activity (for instance, Education x Research, or Research x Campus Operations) have been analysed in several sub-sections of the SHE literature. Throughout this paper, we refer to these initiatives as "integrative projects."

There exists extensive literature on integrative projects. For instance, initiatives involving both Education and Research are frequently studied as research-oriented learning and inquiry-based learning, in a stream of literature of their own (Ruuskanen et al. 2018; Levy & Petrulis 2012; Hu et al. 2008; Spronken-Smith & Walker 2010). Initiatives integrating education and community engagement are most often investigated in a stream of scholarship that focuses on community-engaged learning, work-integrated learning, experiential learning, service learning, or real-world learning (Boyd et al. 2017; Brugmann et al. 2019; U of T White Paper 2017; Wright, Cain & Monsour 2015; Hardin et al. 2016; Sterling 2010; Blake et al. 2013; Brundiers et al. 2010; Earl et al. 2018; Pretorius et al. 2019). Projects tying research with community engagement objectives are commonly studied in literature on co-production of knowledge, co-creation with community, community-engaged research, applied research and innovation, urban transition labs and real world laboratories (Mauser et al. 2017; Clifford & Petrescu 2012; Singer-Brodownski et al. 2017; Schapke et al. 2018; Nevens et al. 2013; Voytenko et al. 2016; Von Wirth et al. 2019; McCrory et al. 2020). Overall, these integrative projects are described as providing reciprocal benefits to both domains, often with an overall gain that is greater than the sum of its parts (Singer-Brodowski et al. 2017; Waheed 2017).

There is limited research on sustainability projects integrating more than two domains. Living Laboratories are by far the most prominent example in the SHE literature (Robinson et al. 2013; Cayuela et al. 2013; Evans et al. 2015; Verhoef & Bossert 2019; Waheed 2017). Campus as Living Laboratory (CLL) projects combine operational management with education, research, or both to create hands-on learning experiences for students (SEED guide; Waheed, 2017). Through the mobilization of some of its unique research and teaching resources towards campus sustainability operations goals, the CLL model enables universities to experiment with new sustainability projects that most other organisations cannot commit to.

2.2 Governance Structure Literature Review

A prominent subject within academic scholarship on the development of sustainability in universities is the structure of institutional governance. Studies have identified the visionary leadership of higher management (Ferrer-Balas et al. 2008; Purcell et al. 2019), the support of sustainability champions throughout the institution (Lozano 2006; Mader et al. 2013), and the use of business management frameworks (Dunphy et al. 2007; Davis & Goedegebuure 2017) as key internal drivers of the sustainability transformation in universities. Some others have analysed the interactions between an institution's sustainability culture and its governing structure to develop sustainability on campus (Spira et al. 2013; Bauer et al. 2018; Adams et al. 2018). In particular, Bauer et al. (2020) highlighted that an institution's culture on sustainability not only shapes but is shaped by the parts of the institutional structure involved in its development.

Our approach to the impact of governance structure on sustainability activities is informed by the organizational learning orientation and holistic orientation framework proposed by Bauer et al. (2020). While both orientations are directed towards the widespread embedding of sustainability in the HEI, their most significant difference lies in the location—within the institutional structure—of the source of the sustainability transformation. We did not find existing literature which studied the influence of the institutional location of the main actors of sustainability on the advancement of sustainability. As such, this paper pays particular attention to the position of the central actors of sustainability within the institution. The institutional hierarchy can be broadly divided into two sides: an academic hierarchy, a sector of the institution working on education or research; and operational hierarchy, a sector of the institution working on maintenance and development of the institution as a whole. These two core communities— operational staff and academic faculty—have become more deeply divided on practices of institutional governance since the 1980s, as part-time faculty and operational staff have earned an increasingly larger role in university leadership (Dad 2011; Ginsberg 2011; Gerber 2014; Salomon-Fernandez 2015). At the same time there is recognition that this binary view can be divisive and there are also those who move between roles and occupy a 'third space' (Whitchurch 2013). The issue of connecting the academic and operational sides is thus core to developing sustainability in the four domains of activity, at the whole-institution level (Robinson 2018).

3. METHODS

This research was conducted using a mixed-method, qualitative case-study approach. First, a literature review in the field of sustainability in higher education was used to determine key research questions and develop our evaluative framework for the cases. Three research intensive higher education institutions in continental Europe, the UK and Canada were selected for the study. Their sustainability activities were recorded and analysed using publicly available grey literature and internal documents generously shared by our partners at the three institutions**.** This grey literature review formed the basis of in-person interviews—held in summer 2019—which were conducted with key sustainability staff and faculty at all three institutions by two University of Toronto interns and authors. The data collection was led by the U of T authors, while the research itself was a collaborative effort among the three universities. As Corcoran et al. (2004) note, sustainability is a complex idea and no two higher education institutions are alike. Thus, case studies are ideal for research on sustainability in higher education so long as the study methods account for certain considerations (Corcoran et al. 2004). Case studies are also appropriate when the investigator cannot control variables and would instead like to study a particular practice without dismissing the complex interplay of variables (Patton and Appelbaum 2003).

The universities we are studying are all large, research-intensive, and internationally recognised universities situated in North America and Europe (Table 1).

Table 1: Overview of the three universities

	Campus Location	Year Founded	Number of Students + Staff/Faculty	Operating Budget (2019/20)
University of Edinburgh	Scotland, Europe	1582[6]	44,510[7] + 13,000[8]	GBP 1.1 billion[9]
Utrecht University[10]	Netherlands, Europe	1636	31,801 + 7,191	EUR 810 million
University of Toronto	Canada, North America	1827[11]	93,081[12] + 22,211[13]	CAD 2.77 billion[14]

4. EVALUATIVE FRAMEWORK FOR CASE STUDIES

Our research seeks to understand how different governance structures affect the operationalization of sustainability at universities. However, to understand and demonstrate the differences between sustainability governance at each institution, we needed a comprehensive framework to summarize the variety of activities put in motion by universities. We use the domains identified from the literature to organize our framework, and investigate the existence of any possible integration across those roles at the institution. To understand the governance structure, we map the position of the main sustainability actors within the institution. Together, this Evaluative Framework helps create a comprehensive summary of sustainability activities at each institution and the governance context within which they exist.

Table 2: Evaluative Framework for the Case Studies

1. Classify the university's sustainability projects within the four domains of activity of universities in society

[6] https://www.ed.ac.uk/files/atoms/files/201908_uoe_annual_accounts_2019_29_online.pdf
[7] http://www.docs.sasg.ed.ac.uk/gasp/factsheet/Student_Factsheet_31072020.pdf
[8] http://www.docs.csg.ed.ac.uk/HumanResources/StaffNumbers.htm
[9] https://www.ed.ac.uk/files/atoms/files/202007_uoe_annual_accounts_2020_27_online.pdf
[10] https://www.uu.nl/sites/default/files/UU%20Annual%20Report%202019%20web%20ENG.pdf
[11] https://www.utoronto.ca/about-u-of-t
[12] https://data.utoronto.ca/wp-content/uploads/2020/06/Finalized-Factbook-2019.pdf
[13] https://data.utoronto.ca/wp-content/uploads/2020/06/Finalized-Factbook-2019.pdf
[14] https://www.utoronto.ca/news/u-t-s-governing-council-passes-budget-2019-2020#:~:text=The%20balanced%20budget%20for%202019,cent%20over%20the%20previous%20year.

Education	*Research*
Community Engagement	*Campus Operations*
2. What integrated activities are there in the three universities?	
3. In what ways are campus Operations and Academics (which includes both teaching and research) integrated for sustainability?	
4. Sustainability Governance structure: Where are the main actors of the sustainability transformation situated within the university structure? Which is the centre 'appointed' to lead institution-wide sustainability?	
5. What is the approach to sustainability adopted by the University?	

5. CASE STUDIES

5.1 University of Edinburgh

Classify your university's sustainability projects within the four domains
Education As a large, multidisciplinary institution, the University of Edinburgh offers courses that engage with the broad idea of sustainability in close to all of its departments (U of E Course Inventory). The "Sustainability and Social Responsibility" course, developed jointly by the School of Education and Geosciences, provides an accessible online learning opportunity for students from any discipline. In addition, "Our Changing World" is an interdisciplinary course available to all students with facilitated group discussions and project work. Currently, The Edinburgh Futures Institute is developing new multidisciplinary elective courses, including one on "Addressing Global Challenges." Furthermore, specific Schools offer a range of program opportunities centred around sustainability. For example, Geosciences hosts a variety of independent and collaborative undergraduate and postgraduate programs, including a MSc in Carbon Management in partnership with the Business School. The latter notably developed a 'Global Challenges for Business' course, required for all 350 first year students in the School's undergraduate programs, which focuses on social and environmental sustainability issues (Yang 2019). In 2018/2019, the Department for Social Responsibility and Sustainability (DSRS) developed a SDG course inventory and started hosting a Social Responsibility and Sustainability Pathways program, which provides 60 students each year with opportunities to learn more about interdisciplinary SRS

issues and methods in experiential, student-led and community-engaged contexts on and off campus, independently of their degree program.

Research

The University of Edinburgh is home to prominent climate research centres, including the Edinburgh Centre for Carbon Innovation (ECCI). As with teaching, research on social and environmental sustainability issues happens throughout the University.

In 2018/2019, the DSRS developed a Scopus-based research inventory that maps all of the academic publications by University of Edinburgh researchers over the last 5 years to the SDGs. This inventory confirms the range of research programmes across the university that relate to different aspects of sustainability. They include: The Global Academies, which provides a nexus for bringing together research expertise on key aspects of sustainability, and the newly-launched Edinburgh Futures Institute (EFI), which aims to combine multi-disciplinary research with co-production of knowledge. This latter Institute was launched as part of the University's Strategy 2030 (2019), which sets out a vision to make the world a better place and to make its research even more interdisciplinary and international, to address global challenges including the Sustainable Development Goals.

Operations

The Department for Social Responsibility and Sustainability (DSRS) was established in 2014 to support the University to achieve its sustainability ambitions by identifying risks and opportunities and catalysing action and collaboration. A SRS Committee, chaired by a senior academic leader in the University and composed of members from academic and professional services, provides oversight and governance for issues led by different parts of the organisation. In 2016, a university-wide Climate Strategy set out a goal to achieve net-zero carbon by 2040. This strategy encompasses an energy reduction campaign, flight cuts, adoption of electric fleet vehicles, policy and behavioural change, and land-based carbon offsetting.

Since 2016, the Estates Department and DSRS have jointly managed a "Sustainable Campus Fund" (SCF), which is dedicated to implementing energy efficiency, reducing carbon emission, supporting renewable energy and other sustainability projects that also have financial returns. By the end of the 2018/19 financial year, a total of £2.3 million had been invested. The £520,000 saved in energy expenditure was fully reinvested in the fund (SRS 2018-2019 Annual Report).

In 2018, the DSRS, in collaboration with the Finance Department, created a reporting system to support action for carbon from business travel. These calculations are used to provide sustainable travel advice and encourage alternative travel options for students and staff (Zero by 2040). To reach its net-zero target, the University of Edinburgh recognises the need for investing in off-campus carbon sequestration for carbon from travel that cannot be eliminated.

The University Operations perspective also includes investments and supply chains. The DRPS works closely with the Finance Directorate and Procurement Office, as it recognises opportunities for impact through business relationships regarding purchasing and investment. In 2018, the University signed the Sustainable Development Goals (SDG) Accord and commitments to the Climate Emergency and the SDGs were integrated in the new University Strategy 2030.

Community Engagement

The University of Edinburgh also attempts to be an actor for social sustainability through its relations with surrounding communities. The University has a long commitment to widening participation in education. The Community Engagement Strategy outlines an approach to support local communities in and around Edinburgh, including support for the inclusion of students from the most marginalised socio-economic groups in Scotland. In 2018, Edinburgh launched its Modern Apprenticeship Program, which enrolls young people from the wider community to work on a range of paid roles across campus while receiving on-the-job training. It also launched the Centre for Homeless and Inclusion Health, which provides both teaching and legal services to improve the health and wellbeing of people experiencing homelessness. The DSRS itself manages a £50,000 Community Grants Fund to support local community organisations. Overall, the University, working in partnership with a range of organizations, has committed to invest up to £8m in social investments to support social enterprise in Scotland and beyond, with thematic priorities around poverty, homelessness, access to education and youth. All of those initiatives support the University's Sustainability and Social Responsibility Strategy and are reported on in the annual SRS report.

What cross-cutting sustainability activities are there in this university?

Research x Operations

The Edinburgh Centre for Carbon Innovation (ECCI) harnesses academic staff expertise from across the University of Edinburgh and beyond and brings together leaders and practitioners from business, finance and the public sector to accelerate change. Examples of key projects are: the 'Place-Based Climate Action Network (PCAN), the Edinburgh Earth and Environment Doctoral Training Partnership, SAGES (the Scottish Alliance for Geoscience, Environment, and Society), and The Edinburgh Futures Initiative. DRPS and ECCI have worked closely together on projects to use the campus and the operations as a 'Living Lab'. For example, a "Climate Kic" project brought together operational colleagues from Estates and Procurement together with researchers and industry partners to develop innovations for addressing carbon and waste.

The Global Academy of Agriculture and Food Security is an interdisciplinary hub of research, teaching and consulting expertise, to support decision making to transform agri-food systems and food security

The College of Arts, Humanities and Social Sciences in collaboration with the DSRS have launched the Make ICT Fair project. U of E researchers work with the Project to develop protocols and gather data to make the Information and Communications Technologies supply chain more sustainable and fair.

Teaching x Community Engagement

There are a range of opportunities which connect teaching and learning with community engagement. For example, the University's "Students as Change Agents" programme, established in 2018 through Career Services, brings together students from different disciplines to tackle real-world problems with wide social, environmental, or economic impact. Furthermore, The Students Association hosts over 250 societies and helps facilitate student volunteering with community groups.

Furthermore, the Edinburgh Futures Initiative is currently developing undergraduate and postgraduate courses and programmes which aim to take interdisciplinary approaches to pressing contemporary challenges. Students enrolled in these courses and/or programmes will receive the

opportunity to work with EFI external partners as they conduct projects concerning pressing, current challenges.

In what ways are campus Operations and Academics (Teaching + Research) integrated for Sustainability?

The SRS Committee provides oversight and governance on SRS issues and action by bringing together a range of academic and professional services staff.

The DSRS hosts approximately twenty living laboratory projects that link students to operational sustainability initiatives within the framework of a course or a student dissertation. All of these projects are managed by DSRS staff, who are specifically tasked to support the link between students' courses and operational objectives.

Sustainability Governance structure

The SRS Committee was established to advise the Central Management Group (now University Executive) and its remit includes providing the drive, leadership and focus to promote SRS at the University. Its members include the Estates Department—which works conjointly with the DSRS on several key initiatives—, the various academic schools that lead research and teaching projects in sustainability, Widening Participation, and other senior leaders who are strongly supportive of advancing sustainability at the university.

The Department for Social Responsibility and Sustainability (DSRS) is the designated centre tasked by senior management to lead the advancement of sustainability across the University of Edinburgh, to strategize for the institution's sustainable future, and to support the various other actors doing sustainability on campus. It works with "almost every part of the University" with the aim of coordinating the development of sustainability programs across campus and in the wider community (Zero by 2040 - Climate Strategy 2016-2026). The DSRS, created in 2013, has its roots in the student-led "Transition Edinburgh University" project, as well as in action enacted by staff in a Sustainability Office previously based within the Estates Department. Now, it is a full department within the University's operational hierarchy. It receives a yearly £1.2 million in funding from and employs approximately 20 people who are all university operational staff.

In 2019, an Academic Lead on Climate Change and Sustainability was appointed by the Principal to support the University's strategic response and connections between research, teaching and operations by providing the University Executive a holistic view on what these domains are doing in climate change and sustainability. The Academic Lead helps ensure that senior University staff make informed decisions regarding these issues.

What is the approach to sustainability adopted by the University?

The University of Edinburgh's Strategy 2030 made a commitment to integrate the Sustainable Development Goals in decision making. The University holds a vision of sustainability that cannot be separated from social responsibility. This definition renders hyper-visible the intertwining between

social and environmental aspects of a sustainability transition. The DSRS supports university reporting on both social and environmental sustainability activities.

5.2 Utrecht University

Classify your university's sustainability initiatives within the four domains

Education

Utrecht University's sustainability education is a distinguishing feature of many of its many academic programs. The University is home to the world-renowned Copernicus Institute of Sustainable Development, which offers distinct Bachelor's and Master's programs along with various sustainability minors for students of other disciplines. Among others, the Bachelor's program in Global Sustainability Science emphasizes the interdisciplinary, complex nature of sustainability challenges. Other branches of Utrecht University such as University College Roosevelt and University College Utrecht offer sustainability education at a Bachelor's level in liberal arts and sciences. The seven disciplinary faculties at the University also offer components of sustainability topics in their coursework.

Research

As a multidisciplinary institution, Utrecht University hosts the seven faculties of Humanities, Law, Economics and Governance, Science, Geosciences, Social & Behavioural Sciences, Veterinary Medicine, and Medicine. These faculties host Bachelor's and Master's programs along with respective disciplinary research that supports the various sustainability projects housed in these faculties. An example is the Copernicus Institute of Sustainable Development, which features four dedicated research groups: Energy, Environmental Sciences, Environmental Governance and Innovation. Notably, the Institute is committed to advancing the SDGs through their research, with particularly strong knowledge production on 8 of the 17 goals.

Operations

Operations departments at Utrecht University are committed to the institutional goal of CO_2 neutrality by 2030. Established in 2015, the Sustainability Program Team within Operations is tasked with making the university "a role model in sustainability performance and conduct, by integrating sustainability into all its activities" (Rademakers, 2018). The Program Team focuses on improving the impact of the University's education and research on operational problem-solving, achieving the carbon neutrality goal by 2030, increasing the visibility of the institution's sustainability efforts and reporting progress transparently.

To create multi-constituent engagement, the Green Office Utrecht (GOU) is commissioned under the Sustainability Program Team as a sustainability hub which supports students and staff through

initiatives which engage the University community for sustainability. The GOU engages students to advance the work on several sustainability themes and also administers the Living Lab program where students research campus sustainability issues flagged by staff.

In addition, the Corporate Real Estate and Campus Department finalised their sustainability ambitions in the 2019 Vision Document for Sustainable Buildings. The Department commits to actualising sustainability ambitions stated in the University's strategic plan, and outlines its objective to shifting the business focus from profit to creating value for 'planet' and 'people.' They have accepted four ambitions for all campus building projects, which are to make the estate functional, healthy, energy-positive and circular.

Community Engagement

Community Engagement activities at the University occur through various streams, given the broad definition of the mission itself. As such, many community engagement activities happen within disciplinary faculties in the form of placements, internships, community projects, and relationships with local organizations. Utrecht Sustainability Institute (USI), a knowledge and innovation-broker institute, facilitates community engagement specifically for sustainability by working with external partners, government bodies and companies to drive urban sustainable innovation. USI occasionally creates opportunities for campus actors to interact and benefit from its external partner networks; however, vast portfolios of USI's activities remain separated from the University's functions.

What cross-cutting activities are there at Utrecht University?

Research x Community Engagement

The Pathways to Sustainability (PtoS) program was created in 2017 to act on sustainability as a strategic research theme of the University. The program conducts transdisciplinary research with public and private partners on societal transitions toward sustainability. The transdisciplinary 'hubs' focus research efforts on specific topics related to the SDGs, with emphasis placed on 'cross-fertilizing' knowledge from various disciplines and co-creating relevant research with societal partners.

Research/Education x Operations

The Living Labs program run by the Green Office integrates research and education initiatives with the campus' operational needs. Among others, students can submit research projects and work toward recommendations on campus sustainability issues as part of their course work. Enlisting students and researchers into problem-solving for campus is one of the ways to promote circularity.

In what ways are campus Operations and Academics (education and research) integrated for sustainability?

Operations and academics are integrated to a limited level. There are few formal settings where the work of operational staff and academics are integrated for sustainability. At present, the Green Office's Living Labs program is a limited example of this integration. However, the University's 2018 Sustainability Report has explicitly communicated ambition to transform the campus into a living lab for sustainability.

The Operations teams have expressed interest in interacting and collaborating with academics, with an example being the Corporate Real Estate Department's work with academics on future projects to create living laboratories within new-building and retrofitting projects. Additionally, the Sustainability Program team consults with researchers on occasion.

Sustainability Governance structure

At Utrecht University, sustainability transformation is led by various actors in the operations and research domains, and also increasingly by those in the education domain. In the Operations department, the Sustainability Program Team and Corporate Real Estate work on campus sustainability, while the Green Office enables staff and student engagement for campus sustainability. On the academic side, efforts are led by the Pathways to Sustainability program and the Copernicus Institute for Sustainable Development. Altogether, sustainability actors are dispersed between the academic and operational arms of the university. It is important to note that the Sustainability Programme Team (operations) and the Pathways to Sustainability program (academic) were both created by higher management to lead the whole-institution sustainability approach at Utrecht University.

What is the approach to sustainability adopted by the University?

The definition of sustainability at Utrecht University is understood to broadly encompass environmental and social aspects, as sustainability is most-commonly described as the sustainable transformation of society. The SDGs are acknowledged and accepted as a sustainability framework at the institution. There is an emphasis on identifying ways of 'doing' and 'being' in a sustainable future, which has spurred a focus on the 'inquiry for sustainability' at the University and effectively asserting the importance of research as a primary driver of sustainability efforts.

5.3 University of Toronto

Classify your university's sustainability initiatives within the four domains

Education

The University of Toronto is a multidisciplinary institution with a wide range of undergraduate and graduate faculties and professional training schools. Sustainability education is distributed throughout the entire institution and featured prominently within a few key hubs like the School of the Environment, which offers collaborative, sustainability-focused degrees at both the Bachelor's and Master's level. The Master of Science in Sustainability Management (MScSM) program offered at U of T Mississauga is a highlight of sustainability education at U of T, amongst other disciplinary graduate studies rooted in sustainability.

Since 2018, the CECCS manages an SDG-based inventory of all sustainability-related undergraduate courses at U of T, which average 28% of the university's total undergraduate course offering as of 2019-2020. Since 2019, the CECCS has coordinated with several academic faculties to implement "Sustainability Pathways" certificate programs, which aim to make sustainability education accessible to all students independently of their degree programs. U of T commits to engaging its entire undergraduate student body in sustainability education.

Research

Sustainability research is conducted within various disciplines at the University and within key research hubs such as the Institute for Sustainable Energy, Institute for Water Innovation, Global Cities Institute, Centre for Sustainable Health Systems, and many more. In collaboration with the CECCS, the Office of the Vice-President Research and Innovation created an SDG-based Sustainability Research Inventory in 2019-2020, which included sustainability publications by U of T researchers over the past 10 years. The inventory found that of the nearly 300,000 publications since the year 2000, 22.8% implicated at least one SDG.

Operations

The University Operations group oversees all Estates activities and strategies at U of T. The group is tasked with maintaining and managing an expanding campus while reducing the GHG emissions of the University, as per the institutional reduction goal. In addition, the University of Toronto hosts a Sustainability Office in each campus' Facilities and Services group. These offices are primarily tasked to promote a culture of sustainability with students, academic, and operational staff. The Sustainability Offices do not lead emission reduction projects themselves.

In September 2019, led by the Facilities and Services members in the CECCS, the University launched its Low-Carbon Action Plan (LCAP), which laid out its strategy to cut GHG emissions by 37 per cent from 1990 levels by the year 2030, and put itself on a path to becoming a "net-zero" institution (LCAP). An Energy Master Plan laying out the path to a net-zero future for 2050 is under development and will be released by late 2021.

The LCAP and the Energy Masterplan emission reduction goals only target Scope 1 and 2 missions, since currently, the University of Toronto does not report on its scope 3 emissions. In 2019-2020 however, the CECCS developed a blueprint to assess and reduce business air travel, tackling a sizable source of scope 3 emissions. In its Presidential Recommendations Report (2020), the Committee highlighted a three-pronged strategy to address this issue.

Community Engagement

The Centre for Community Partnerships is a key community engagement actor at the University. While its focus is not solely on sustainability, the Centre supports the sustainability community-engaged learning courses (CEL), which were identified in an SDG-based courses inventory created by the CECCS. It provides this support by facilitating the interactions of students and researchers with community partners and providing guidance and resources on strengthening community relationships. Many other forms of community engagement activities happen within the various faculties and departments at U of T, and which are not fully described in this paper.

What cross-cutting sustainability activities are there in this university?

Education x Community Engagement

The Agent of Change (AOC) is a subcommittee of the CECCS dedicated to further bridge education and community engagement at the University, and has focused its efforts on increasing community-engaged learning (CEL) at the University. This subcommittee works on the goal of enlisting at least 5000 students in community-engaged projects.

Education/Research x Community Engagement

Campus as a Living Laboratory (CLL) is a subcommittee of the CECCS that seeks to create more CLL projects which engage students, faculty instructors and operational staff. It works to realize the goal of engaging 1000 students in Campus Living Laboratories every year. In 2019-2020, 6 major campus projects were identified to host CLL projects.

The "Campus as a Living Laboratory for Sustainability" course is offered each year, and allows 6-7

groups of students to each work on a campus sustainability research project for credit. The course is open to students of all disciplines and faculties. Additionally, the Engineering Department offers campus capstone projects to their students, and which are also for credit.

Research x Community Engagement

The Centre for Urban and Community Studies manages Community/University Research Partnerships (CURP), which pair U of T researchers with external associations to develop "applied scholarship on the practical problems and policy issues associated with urban living, particularly poverty, housing, homelessness, social welfare, and social justice issues" (Urban Centre U of T 2020).

In what ways are campus Operations and Academics (teaching and research) integrated for sustainability?

One of the principal mandates of the CECCS is the coordination of operational staff, academic staff, and students to further sustainability at the University. This mandate is enacted in the makeup of the Committee itself: it is composed of all the three constituencies.

As mentioned previously, the Committee, through Campus as a Living Lab (CLL) subcommittee, actively seeks to establish connections between academics and operations by providing an opportunity for students and course instructors to collaborate with operational staff on campus sustainability projects.

Through the leadership of the CECCS, connecting academic and operational staff through integrative projects has become a central aspect of the sustainability transition at U of T. However, although this integration is gaining support within the institution, it is not yet common practice.

Sustainability Governance structure

The University's Operations and Real Estate Department works to improve campus sustainability. The Department is embedded within the higher administration of U of T and works directly with construction, renovations, retrofits and system upgrades.

In 2017, The Committee on the Environment, Climate Change and Sustainability (CECCS) was created by the President's Office as part of its *Beyond Divestment* strategy, with a goal to support multiple existing efforts on campus and strategize for the advancement of sustainability across the whole institution. The CECCS stands outside the formal academic and administrative hierarchies of the institution and operates as an advisory group for the President to drive forward projects for sustainability in the four domains of activity.

What is the approach to sustainability adopted by the University?

The University of Toronto follows a broad definition of sustainability that is rooted in the concept of regenerative sustainability and net-positive frameworks that include both social and environmental

issues (Robinson & Cole 2015). By participating in the Times Higher Education Impact rankings in 2019 and 2020, the University has increased its involvement with the UN Sustainable Development Goals (SDGs).

6. DISCUSSION

In analysing the influence of an institution's sustainability actors relative to its position on either the academic or operational side, we recognise the separation between these two structures as a significant consideration in evaluating sustainability governance. Like many universities, the University of Edinburgh, Utrecht University and the University of Toronto host a large variety of actors working towards the advancement of sustainability within both the academic and operational hierarchies. Table 3 classifies the principal sustainability actors identified at the three institutions within their respective hierarchy structure.

Table 3: Mapping Sustainability Actors by Operational or Academic Side

	U of Edinburgh	Utrecht U	U of Toronto
Operational Side	- Department of Sustainability and Social Responsibility (DSRS) - Finance Directorate - Edinburgh Innovations - Estates Department - Information Services - Student Services - Strategic Planning - Communications and Marketing (stakeholder relations)	- Sustainability Programme Team - 'Corporate Real Estate & Campus' - Green Office - Utrecht Sustainability Institute (community engagement)	- Tri-campus Planning - Facilities & Services - Sustainability Offices - Centre for Community Partnerships (community engagement)
Academic Side	- 3 Colleges (Science and Engineering; Humanities and Social Sciences; Medicine and Veterinary Medicine) and 21 schools - Institutes such as the Edinburgh Futures Institute and Edinburgh Centre for Carbon Innovation	- Pathways to Sustainability - Various academic divisions and research centres, including Copernicus Institute of Sustainable Development - Central administration in charge of academic	- Various academic units, departments, centres, and schools,including the School of the Environment - Various research centres and institutes

	- Institute for Academic Development (IAD)	affairs	- Central administration in charge of academic affairs (VPRI, VPP, VPI)
Across Operations and Academic Sides	Social Responsibility and Sustainability Committee (reports into University Executive)		Committee on the Environment, Climate Change and Sustainability (CECCS)
Outside Operations and Academic Sides			

Most of the key sustainability actors in Table 3 occupy highly comparable positions within each university. All three institutions host the equivalent of a Real Estate department, a centre for community engagement, various academic faculties and research centres, and a central administrative body in charge of academic affairs, all of which share analogous roles in advancing sustainability at the universities. These operational and academic groups are essential actors of any large research-intensive university who have committed to integrating sustainability within their own existing mandate. While their contribution to the advancement of sustainability is certainly not negligible, it is comparable within the institution's business-as-usual activity. What differentiates these three case studies is the academic and/or operational positioning of the sustainability actor specifically designed by the university's higher management to lead, coordinate, and strategize for institution-wide advancement of sustainability. Despite the existence of several other actors for sustainability, these 'designated centres' are ultimately key actors of sustainability action because of the central mandate that they are given, which is the case in many institutions like the University of British Columbia, the Massachusetts Institute of Technology, and McGill University (UBC Sustainability Initiative 2020; McGill Sustainability 2020; MITOS 2020). As well, by 'institution-wide' sustainability, we refer to the changes and activities that can be considered as transformative (Martin & Samels 2012; Robinson & Cole 2015) and promote the sustainability transition of the university (Crow & Dabars 2015). In practice, that means focusing our attention on programs that either do or have the potential to reach a considerable percentage of students, faculty, or staff within the university. This concept differs from programs that are more localised and which add parts to the sustainability potential of the university.

Between the three universities, we observed three distinct models for the positioning of mandated sustainability actors, each with varying degrees on the operational-academic balance. In the

case of the University of Edinburgh, its current model championed a strong operational actor whose initiatives frequently tapped into the academic side. Specifically, it is the Department of Social Responsibility and Sustainability (DSRS), in operations, who is designated to strategize and facilitate the implementation of programs for the University as a whole to rise up to the challenges of social responsibility and sustainability (DSRS 2016). The Social Responsibility and Sustainability Committee has the remit to develop and oversee progress on goals and targets on key issues. Meanwhile, Utrecht University has two appointed actors, one on the operational side and one academic. The Sustainability Program Team is the appointed operational actor tasked with realizing the campus sustainability goals, while the Pathways to Sustainability (PtoS) Program team leads efforts from the academic hierarchy by advancing the sustainability research profile of the institution. Finally, the University of Toronto's main appointed actor houses both operational and academic individuals within a single office that is external to the hierarchical structure of both sides. Acting as an advisory and connecting body for the institution's sustainability transition, the Committee on the Environment, Climate Change and Sustainability (CECCS) was created in 2018 (U of T CECCS 2018). These 'appointed sustainability actors' are underlined in Table 3. The following section discusses the roles of the various actors in the three universities and highlights how the hierarchical location of the 'appointed' sustainability actors impacts the prioritization of certain domains of sustainability activities over others.

University of Edinburgh

The University of Edinburgh's mandated sustainability lead is the Department of Social Responsibility and Sustainability (DSRS). It is tasked by senior management to strategise the University's sustainability advancement and support other stakeholders in the process. While it is an operational actor, the DSRS also assumes leadership on several initiatives which incorporate academic actors and can be considered academic in nature, such as its co-curricular SRS Pathways program and the 20 on-campus Living Labs. Both initiatives engage students in operational projects that address sustainability, but the Living Labs go further by creating the platform for students to access operational projects for their courses and dissertations with the active support of staff from DSRS and the research-oriented Edinburgh Centre for Carbon Innovation (ECCI). Furthermore, the DSRS has taken the initiative of creating inventories to support academic work on sustainability, which map out courses and past academic publications at the University that relate to the SDGs.

The University has been a regional and global leader in operational sustainability for several years, with the close collaboration between the DSRS and the Estates department having yielded ambitious yet achievable targets for the University's transition to sustainable operations. For its part, the DSRS and its positioning within the operational Corporate Services Group of the University grants it a considerable budget and staff, as well as key connections and working relationships with various other operational actors in the University. For example, the DSRS and the Estates Department produced the 2016 Climate Strategy and pushed senior management in operations to commit to consulting the SDGs in all business decisions. As previously elaborated, the DSRS' staff also work with a range of academic stakeholders from across the University as a way to provide a concrete platform for their research and teaching. The DSRS' ties with academic sustainability also exist in the fact that its oversight board, the SRS Committee, has members who lead the various schools at the University.

The strong role that an operational actor in the DSRS has in leveraging operational and academic sustainability at the University is supplemented by independent academic work carried out by academic units. The University's research and teaching programs in sustainability are top-tier, such

as those developed by the School of Education and Geosciences and programmes such as the Students as Change Agents which provide integrated opportunities for students across the University. The University's Community Engagement initiatives are led by a Community Engagement Programme Board which encompass various actors from across the University.

At the University of Edinburgh, we observed a mandated sustainability actor in operations who also has various ties with the academic side, allowing it to lead joint projects and facilitate the integration of research and teaching objectives with operational projects. This technically materialises in the considerable advantage of the academic side having a platform to better ground and test new sustainability knowledge through co-production, which gives the University an edge in comparison to solely academic projects. Ultimately, while the DSRS aims to cut across traditional hierarchy boundaries (Cooper & Gorman 2017), its position in the University's operational side nevertheless renders it more focused on operational sustainability objectives as opposed to university-wide sustainability education and research initiatives. This is not necessarily a disadvantage, as we acknowledge the limitations when a main operational actor is expected to reach to the academic side and lead academic sustainability initiatives.

Utrecht University

Utrecht University has a mandated sustainability actor in each of the academic and operational sides. On the academic side, leadership in sustainability is designated to the Pathways to Sustainability (PtoS) program team, while the designated actor in operations is the Sustainability Programme team.

The adoption of sustainability as one of the University's four strategic research themes led the Executive Board to generate a central push for the advancement of sustainability (UU Strategic Plan, 2016-2020). The Board directly funded the creation of the PtoS program in the academic hierarchy, which fosters transdisciplinary research for sustainability. Through its four research hubs and its concerted effort to engage various societal stakeholders in the research process, the program facilitates the co-production of knowledge for sustainability which has been called for in recent SHE literature. The program aims to decrease barriers and increase the appeal of transdisciplinary research for sustainability among academics at the University. The PtoS program's position as an academic actor opens up connections and collaboration potentials in advancing sustainability in research over the three other domains.

On the operational side, the Sustainability Programme team acts as the appointed actor, tasked with realizing the operational ambitions of carbon neutrality by 2030 (UU Strategic Plan, 2016-2020) and actualising campus sustainability objectives through collaborations with researchers and other operational actors such as the Corporate Real Estate and Campus teams. They make a conscious effort to engage other constituents of the University, exemplified by engagement with researchers to improve the biodiversity of campus lands and with students to run sustainable behaviour change campaigns. Furthermore, the Sustainability Programme team's Green Office is tasked with raising awareness on sustainability achievements and engaging staff and students in sustainable projects such as the living labs. Altogether, the Sustainability Programme team is most effective in advancing sustainability in Operations over the other three domains of activities.

Sustainability initiatives in the education and community engagement domains currently lack a university-wide mandate and are often the independent initiatives of academic and operational units, carried out in a distributed manner. The 2018 Sustainability Report suggested the formulation of a sustainability education program with the ambitious goal of encompassing all students regardless of

their disciplinary focus. The Copernicus Institute on Sustainable Development currently leads in sustainability education among other academic faculties with its offerings of various Bachelor's and Minor programs, however, its engagement effectively only includes students enrolled in these programs. Similarly, a distributed approach is observed in community engagement. Although many faculties have connections to relevant external stakeholders, there is a lack of organized efforts at the university level. Community engagement activities are mostly observed in projects led by other actors, such as the Corporate Real Estate department (Circular Pavilion Project), the Sustainability Programme Team (Biodiversity Project) and the PtoS program (Stakeholder Engaged Research).

At Utrecht University, the separate mandated actors in each of the academic and operational sides creates a dynamic where initiatives developed by the two distinct actors are often not integrative or cross-cutting in nature. For example, the Sustainability Programme team's success in creating connections with academics for operational sustainability is still limited, often at the level of outreach. However, this is not a disadvantage but is simply the resulting condition. We highlight that each actor's mandated focus on their own respective side enables them to allocate resources and staff in a more directed manner, creating initiatives that are well-developed in each side. The Green Office's Living Labs program is a good example of current integration between academic and operational actors on a project, but there exists room for improvement, with one being the Corporate Real Estate department's future plans to collaborate with academics on new-builds and retrofits. Closer integration between the appointed academic and operational actors will enable both to better plan a whole-institution sustainability approach that was mandated by higher management during their inception. Lastly, while the two sustainability actors in the operational and academic sides mean that the University is able to prioritize research and operations, the domains of education and community engagement for sustainability are still developing.

University of Toronto

Sustainability research and teaching at the University of Toronto are developed locally in a number of academic faculties and departments across the three campuses. The Office of the Vice-President, Research and Innovation, an operational staff unit, played a key role in developing a whole-institution sustainability research inventory in 2019 in partnership with the Committee on the Environment, Climate Change, and Sustainability (CECCS). Under the leadership of the Facilities and Services group in operations, the University has made considerable commitments to reduce its carbon emissions. However, these commitments remain slightly less ambitious than those of the University of Edinburgh. The University's appointed sustainability actor, the CECCS, is a Presidential Advisory Committee established in 2017 with a mandate to bring together students, staff, faculty and alumni to support the development of university-wide sustainability projects and recommendations. Key projects led by the Committee include expanding Campus as Living Lab (CLL) projects and furthering initiatives to increase participation in community-engaged learning (CEL) for sustainability. As well, curricular pathways are being developed to open sustainability education to students of all disciplines, supported by the creation of an inventory of sustainability research published by the University.

The CECCS presents a unique case among the universities as it is situated outside of the institution's formal operations and academic hierarchies. It takes on the role of a non-binding consultancy with the university's senior management and is composed of both academic faculty and operational staff who are selected on the basis of nominations. As funding is typically localised within either the operational or academic sides, the CECCS' positioning has initially prevented it from receiving

significant institutional funding, often dependent on short-term presidential grants and external donations. This limitation exists only in the first years of its inception, as plans are currently in place for the CECCS to have a formal budget supporting its initiatives. The nature of these initiatives, on the other hand, are the advantage of the CECCS model. It is better positioned as a Committee to bridge the divide between academics and operational staff as initiatives are developed jointly between actors from the two sides, which ideally results in a more balanced and integrated approach to institution-wide sustainability projects in the education, research, operations, and community engagement domains.

Community Engagement for Sustainability

Institution-wide community engagement for sustainability was still in its developmental stages in the three universities, and the case studies were not able to observe meaningful correlations between a university's commitment to community engagement and the position of its appointed sustainability actors on either the academic or operational side. Instead, community engagement seemed to materialize from a broad variety of departments in the university. Furthermore, community engagement for sustainability was also observed to have different meanings in the three case studies. At the University of Edinburgh, the DSRS runs programmes for staff and students, as well as advances community engagement on SRS issues. At Utrecht University, community engagement involves societal stakeholders in the research process through programs such as the Pathways to Sustainability. And at the University of Toronto, it refers to increased student participation in Community Engaged Learning (CEL). The difference in the adoption of Community Engagement for sustainability at the universities suggests that different academic or operational actors can provide leadership for the initiative depending on the intended impact.

Integrative Projects

From our case studies, we argue that universities should enact domain-intersecting sustainability projects as a means to leverage a less prioritized domain through integrating it with a more prioritized domain. While the University of Edinburgh has not laid out a whole-institution sustainability education plan at the moment, its Pathways and Living Labs programs have created highly meaningful opportunities for more students to learn about sustainability. Similarly, projects such as the Make Information and Communication Technologies (ICT) Fair ties research actors with institutional procurement issues managed by operational staff. These programs have allowed the University of Edinburgh to harness its strong engagement in operational sustainability to meaningfully enter the fields of sustainability teaching and research, which are its comparatively less-developed domains. At the University of Toronto, the CECCS' Agent of Change subcommittee aims to further develop its community engagement for sustainability portfolio, but projects uniquely focused on community engagement have not yet been prioritized in the University's sustainability and climate strategies. Rather, the development of community engagement initiatives have depended on integration with the education domain in the form of Community-Engaged Learning opportunities, which helps maintain a sustainable, long-term strategy to enhance both these two domains. Similarly, at Utrecht University, where Community Engagement is the least prioritized domain, integrative projects such as the Pathways to Sustainability transdisciplinary research program add to its portfolio of sustainability initiatives. Even for institutions in differing governance contexts, we suggest that

integrative projects may act as valuable steps to embed sustainability in a domain that has so far been less prioritized.

7. CONCLUSION

This qualitative case-study of the three research-intensive universities sought to understand the impact of sustainability governance structures on the social roles or domains of universities that are prioritized for sustainability advancement—education, research, operations and community engagement. We have found that the positioning of the designated sustainability leadership considerably influences which among the education, research and operational domains are prioritized for sustainability advancement at the university. This positioning is also deterministic of the degree of integration between operations and academic actors on sustainability initiatives. We observed that a sustainability leadership hosted on the operational side would mean that sustainability projects advanced at the university were primarily in the operational domain, which is logical. However, if this operational leadership can also engage academic actors on their initiatives, the impact of these academic initiatives can be increased as they now have access to the campus' operations platforms to test new knowledge. Still, a major finding was that sustainability leadership have a greater capacity to develop initiatives in the corresponding domain where they are hosted. When the academic and operational domains have their own separate sustainability leadership, initiatives in each domain were found to be well-developed but lack integration between them. This integrative aspect may be addressed by positioning the sustainability leadership outside of either domain's formal institutional hierarchy, which we observed to lead to better bridging between the academic-operational divide in sustainability initiatives. Since there are differences of which domains are leveraged depending on the position of the sustainability leadership on campus, we affirm the value of integrative projects as a way to increase engagement and to create synergy in developing less-prioritized domains.

Through the application of our case study's framework, we identified various strengths and limitations to the process. Firstly, this paper uses education, research, community engagement and campus operations as the four domains of a higher education institution. However, for large universities, the management of considerable endowment, pension funds, and sustainable investments is increasingly recognised as an important obligation. This obligation has perpetuated widespread student-led fossil fuel divestment campaigns (Maina et al. 2020; Healy & Debski 2017) and growing institutional commitments to invest in environmental and social sustainability assets (AASHE Stars Reports: Arizona State University 2020; Colorado State University 2019; Cornell University 2020; Stanford University 2019). As well, this paper did not consider enough engagement with sustainable finance, which were preliminarily found to be an important factor in the community engagement domain. Furthermore, our framework does not capture important differences among the sustainability projects at universities such as financial investment, visibility, number of people engaged or impacted and other such quantitative criteria. However, the complex entanglement of all those values make a comparison of sustainability projects hazardous at best. This paper does not intend to compare which university has advanced further in sustainability, as optimal advancement can look differently for different institutions. Rather, using detailed qualitative case studies, it attempts to evaluate whether some domains of activity have been given more significance than others within each individual university.

Additionally, we selected only three institutions for this case study so that we can commit to a sufficient analysis of the systematic qualitative information and extend contact among the three universities, though we acknowledge that a greater number of studied institutions would solidify or challenge this paper's findings. Finally, in an effort to understand the impact of sustainability actors mandated by the institution, particularly by upper management, we did not include examples of grassroots efforts and student-led sustainability initiatives within the university. Such efforts greatly contribute to and are indicative of sustainability culture on campus and should be inventoried for other types of analyses.

Acknowledgements

The study was made possible by a grant for the Adams Sustainability Champions Internship at the University of Toronto, which invited two students (undergraduate and graduate) to visit and interview key sustainability actors at other institutions in the summer of 2019. Beyond research, one of the overt objectives was to build a network among universities and enable a mutual knowledge transfer with a depth that surveying the academic literature could not allow. Our approach in this research project seeks to encourage these connections.

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Appendix 10 - Program of the 2021 Better Buildings Boot Camp

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9:00 - 9:15	Welcome! Mike Singleton of SBC opens the Better Buildings Boot Camp and welcomes you all.	Daily Warm Up Activity: Fun and Games with Emily Fardad	Daily Warm Up Activity: Yoga with Joshua	Integrated Design Charrette - topics include IEQ (WELL/Fitwel), Fenestration, Opaque Assemblies, Mechanical Systems, Solar Dave Petersen, Cara Sloat, Adam Jones, Bettina Hoar, Alex Lukachko, Larry Bryden	Daily Warm Up Activity: Jamie's Drama Games
9:15 - 9:30	Team Activity: "Meet your Team!" Get to know you break out activity in Teams (reverse cocktail hour: 3 numbers)	Presentation: "Energy Model of the Project Building" what is energy modelling and model of the building (Ryan Evans and Sean Sirgi)	Presentation: "Fenestration" aka "windows" (Nicole Parsons)		Presentation: "Financing Buildings": Anjali Varma
9:30 - 9:45	Presentation: "High Performance Goal Setting" (Michelle Xuereb)				
9:45 - 10:00		Plenary Activity: Ryan and Sean answer "Q&A Energy Model of the Project Building" Live Q&A from groups about the prior session (1:2:4: all)			
10:00 - 10:15		Presentation: "Human Centric Design" (Liam O'Brien)			
10:15 - 10:30			Plenary Activity: "Q&A Fenestration" Live Q&A with Nicole Parsons from groups about the prior session (1:2:4: all)		Plenary Activity: "Q&A Financing Buildings" Live Q&A with Anjali Varma with groups about the prior session (1:2:4: all)
10:30 - 10:45	COFFEE ROOM BREAK		COFFEE ROOM BREAK		COFFEE ROOM BREAK
10:45 - 11:00	Plenary Activity: "Setting Our Own Objectives" Bettina Hoar 9 why's		Presentation: "Mechanical Systems" Josh Lewis		**TEAM PRESENTATIONS Students present their**
11:00 - 11:15		COFFEE ROOM BREAK			

11:15 - 11:30	Presentation: "Building Introduction" Larry Yang of U of T presents the building	Plenary Activity: "Q&A Human Centric Design" Liam O'Brien Live Q&A from groups about the prior session (1:2:4: all)			**recommendations to all SMEs and the U of T Team**
11:30 - 11:45		Team Activity: Bettina Hoar "Conversation Cafe"			
11:45 - 12:00	Plenary Activity "Q&A Building Introduction": 1-2-4-All with Larry Yang. Question: What questions do you have for the UofT team about making the building better at this stage?		Plenary Activity: "Q&A Mechanical Systems" Live Q&A from groups about the prior session (1:2:4: all)		
12:00 - 12:15	Lunch	Lunch	Lunch		Lunch
12:15 - 12:30					
12:30 - 12:45	Presentation: "Deep Energy Retrofits" (Carolina Streber, Mikael Sydor)	Presentation: Alex Lukachko "Opaque Assemblies"	Plenary Activity: "Pondering the Building" with Bettina Hoar		Presentation: "Pie in the Sky: what energy modelling can do" Adam Barker
12:45 - 1:00					
1:00 - 1:15			Team Activity: "What's the Worst that Could Happen" Bettina Hoar leads the TRIZ activity		
1:15 - 1:30					
1:30 - 1:45	Plenary Activity: "Brainstorming Ideas" To liberate the unique insight into how to make this building better. We begin by loosening and listening to the whole group about what could be done with a Mad Tea Questions for the Mad Tea are here.	Plenary Activity:Alex Lukachko "Q&A Opaque Assemblies" Live Q&A from groups about the prior session (1:2:4: all)			Plenary Activity: "Shift and Share" What can we learn from EACHOTHER?
1:45 - 2:00		Plenary Activity: "Q&A about Friday" Bettina Hoar (Team Presentations and Shift & Share)	Plenary Activity: "Q&A about Friday" Bettina Hoar (Team Presentations and Shift & Share)		
2:00-2:15		SPOTLIGHT A: Urban Resilience Danny Pearl	SPOTLIGHT A SOLAR Adam Jones	Fishbowl: "What Just Happened?" Have the SME's	

2:15 - 2:30	SPOTLIGHT B 2-3 pm: LID Jen Hill	SPOTLIGHT B: LIGHTING Gerry Cornwell	SPOTLIGHT B Greening a Campus Scott Henderschott, U of T	talk about the charrette as if at a water cooler and the students can listen/observe/ask questions	
2:30 - 2:45		SPOTLIGHT C: ACCESSIBILITY Jayde Malam			"Closing" BOOT CAMP END: Mike Singleton gives thanks, invitations to Green Building Festival, Certificates of Completion
2:45-3:00					