



THE UNIVERSITY OF BRITISH COLUMBIA  
sustainability

2021/22

# Annual Sustainability Report





# About UBC

The University of British Columbia (UBC) is a global centre for teaching, learning and research, consistently ranked among the top 20 public universities in the world and recently recognized as North America’s most international university.

We acknowledge that UBC’s campuses are situated within the traditional territories of the Musqueam, Squamish and Tsleil-Waututh, and in the traditional, ancestral, unceded territory of the Syilx Okanagan Nation and their peoples.

Our Indigenous Strategic Plan advances our vision of becoming a leading university globally in the implementation of Indigenous peoples’ human rights, and is our response to the Truth and Reconciliation Commission’s 94 Calls to Action.

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## Foreword

As campus life slowly resumed this year, UBC made major advances on sustainability. Highlights included endorsement by the UBC Board of Governors of ambitious new climate action plans for both campuses, progress on embedding climate justice through our Climate Emergency Response efforts, and the launch of Campus Vision 2050 – a comprehensive land use planning and engagement process that will shape how the Vancouver campus changes and grows over the next 30 years. But these accomplishments are only a small slice of this year’s sustainability story at UBC.



Students today face the twin crises of the climate emergency and biodiversity loss. To help prepare them, this year faculty launched a new Bachelor of Sustainability at our Okanagan campus, and a new Climate Studies and Action Certificate in Vancouver. In addition, the SEEDS program provided hundreds of students with research experience through on-campus projects, while the Sustainability Scholars program recruited more graduate students than ever to work on applied research for organizations across BC. Faculty support, including new Climate Education Grants and the Sustainability Fellows program, assisted faculty to develop new and revised climate action and sustainability courses, and the Campus as a Living Lab initiative funded new projects to test sustainability ideas on campus.

The breadth, depth, and innovation in UBC’s sustainability research is remarkable – and impossible to summarize comprehensively. But to take just two examples, a biodiversity solutions cluster – the Interdisciplinary Biodiversity Solutions Program (IBioS) – added five new faculty to produce world-class research, develop policy-relevant solutions, and build capacity through partnerships. And in news that attracted global coverage, the Department of Geography launched the Centre for Climate Justice, led by Professors Naomi Klein and Candis Callison.

UBC also continues to advance climate action and sustainability through our operations. Low carbon energy supply is increasing in Vancouver with the expansion of the Bioenergy Research and Demonstration Facility, while the Okanagan campus continues to invest in decarbonizing heating and cooling systems, reducing overall energy demand, and is revising green building and energy targets for all new capital and renewal projects.

High performance building requirements are exemplified by the Skeena Passive House residence at UBC Okanagan, and the Evolve Faculty and Staff Housing Project in Vancouver designed to Passive House certification and Net Zero Energy ready. UBC also introduced a new climate-friendly food production and procurement program system wide which aims to reduce waste and emissions while increasing food recovery for those in need. New performance dashboards featuring open data are increasing accountability.

UBC continues to advocate for and plan the Millennium Line SkyTrain extension to the Vancouver campus. An ambitious new Transportation Plan for the Okanagan campus includes a subsidised faculty and staff transit “Pro Pass”, a parking levy to fund sustainable transportation programs, and new technology to track and manage parking use in real time.

In summary, UBC demonstrates sustainability leadership in teaching and research, operations, and community life. But we know even more can be done. We hope this report inspires even greater action and commitment in the year ahead.

### LINDA NOWLAN

Senior Director, Sustainability Hub

### MICHAEL WHITE

Associate Vice-President, Campus + Community Planning

### ROB EINARSON

Associate Vice-President, Finance & Operations (UBC Okanagan)

# Teaching, Learning and Research

Across UBC, faculty and students are teaching, learning and exploring sustainability through hundreds of courses, programs and research projects. UBC's ambitious goals are for all students to have access to sustainability learning alongside their chosen degree program; to create diverse learning and co-curricular engagement opportunities for students; and to be global leaders in applied research on sustainable behaviour, infrastructure, and communities.

**925**  
sustainability related  
courses across both  
campuses

**OPEN**

New Centre for  
Climate Justice at  
UBC Vancouver

**NEW!**

Bachelor of  
Sustainability at  
UBC Okanagan

**UBC**

declared a Climate Emergency  
and committed to 9 areas in  
Task Force report

**393**

faculty researching  
sustainability related  
topics at UBC Vancouver

**48**

climate change related  
courses at UBC Vancouver



## Teaching and Learning

Each year, thousands of students learn about issues such as the climate emergency, biodiversity loss, unsustainable food systems, racial equity, and social justice through courses and programs offered by faculty from a variety of disciplines. To encourage students to explore sustainability, we curate and promote UBC’s wide range of sustainability learning opportunities. And we catalyze teaching and curriculum innovation through grants, a fellowship program, and other resources.

### UBC VANCOUVER

**Sustainability Fellows pioneer Certificate in Climate Studies and Action »** Six interdisciplinary faculty teams advanced new sustainability education initiatives including a unique new Certificate in Climate Studies and Action that can be added to any UBC undergraduate degree, co-led by Dr. Tara Ivanochko (Faculty of Science) and Dr. Jessica Dempsey (Faculty of Arts).

**New Mining Law and Sustainability Program »** The Allard Law Executive Learning Program offers a novel framework for making business decisions — one that goes beyond “business as usual,” and considers human and Indigenous rights, climate change and anti-corruption laws and regulations that advance sustainability in the mining industry. Online instructor-supported format for industry professionals, offered in partnership with UBC Extended Learning.

**Six Climate Education Grants support climate action curriculum »** Curriculum now under development includes a virtual / augmented reality field trip focused

on climate justice within Indigenous territories, climate action through geomatics courses in Forestry, and new climate-focused content in medical, business, social work, and library courses.

### UBC OKANAGAN

**New Bachelor of Sustainability launches »** A four-year direct-entry program that inspires students to address complex environmental challenges by integrating knowledge from different academic subjects, with hands-on and community-based learning. Students can choose from one of four concentrations: environmental analytics, environmental conservation and management, environmental humanities or green chemistry.

Offered by the Irving K. Barber Faculty of Science, Irving K. Barber Faculty of Arts and Social Sciences, and Faculty of Creative and Critical Studies.

**Campus joins worldwide Climate / Justice Teach-In »** Students, faculty and staff came together for a dialogue on climate / justice and an introduction to the first ever UBC Okanagan Climate Action Plan, highlighting new targets to reduce operational emissions by 65% and emissions from food systems, waste & materials and commuting by 45% by 2030.

The teach-in event raised interconnected climate and justice issues, and featured over 20 faculty exploring related research in diverse disciplines. Feedback from participants indicated that their awareness of opportunities for climate action increased by 25% in food systems, 25% in waste and materials, and 19% in commuting.

### FEATURE STORY

#### Nursing 290: Health impacts of climate change

Climate Education grants administered by the Sustainability Hub support faculty members to integrate new climate change course content, particularly in departments where climate change is not usually integrated into teaching and learning.

Ms. Raluca Radu, faculty lecturer in the Bachelor of Science in Nursing program, identified a knowledge gap related to the health impacts of climate change in a Canadian specific context, in particular learning grounded in a case-study pedagogical approach.

To support students with identifying the relationships between environmental changes and human health, Ms. Radu and a graduate student funded position developed new course content. The case study highlights local examples of how British Columbians are experiencing and responding to diverse climate change impacts, and supports students learning to apply an upstream, equity-based lens to these topics.

“The impact of this grant-funded project will be long-lasting, as it will allow students for years to come to learn about the intricate ways in which climate change affects human health in British Columbia, challenging them to engage with the topic through critical analysis and interdisciplinary collaboration.” - Raluca Radu.

VANCOUVER

\$109k

in funding to support climate and sustainability education

VANCOUVER

4,000+

students learning about climate in revised courses

VANCOUVER

779

sustainability-related courses

OKANAGAN

146

sustainability-related courses



# Spotlight: Experiential and field-based teaching

UBC offers a variety of opportunities for undergraduate and graduate students to engage in sustainability learning and research through experiences offered outside the classroom. Experiential hands-on learning provides students with applied knowledge, and helps connect theory to practice in the field.

## FEATURED COURSES AND PROGRAMS

**ENVR 400: Community Project in Environmental Science »** Students work in interdisciplinary teams to undertake a collaborative research project in this experiential course offered through the Department of Earth, Ocean and Atmospheric Sciences.

Through an instructor-guided collaboration between student teams and community partners, teams work together to articulate project questions and goals, devise methods, conduct research and communicate results. Based on field work and data collection, students learn to apply a subset of the major technical tools used in environmental science (e.g., models, statistical analysis, network monitoring, population surveys). Teams then communicate a coherent synthesis and analysis of environmental information, orally, graphically, and in writing, providing the community partner with applied knowledge and actionable ideas to pursue.

**BIOL 371: Flora of British Columbia »** A 10-day course held at UBC Okanagan, including daily field exercises that introduce students to the flora of BC, plant identification, and biogeoclimatic zones. The main aim is to equip students with an appreciation for and understanding of native vascular plant flora. Knowledge is developed through field excursions into as many habitats as possible, as well as through learning plant identification and herbarium processing skills.

Other aspects of the course include understanding the role of plants in our world, an overview of plant morphology, how to define habitats with respect to

their component plant species, the use of photography in botany, phytogeography, invasive plants, conservation, and a basic introduction to biogeoclimatic zones in British Columbia.

Collaborating with local partners develops complementary skills, and in some cases can produce immediate benefits to the community, academic and operational sustainability efforts, and contributes to enriched student, research and professional experiences.

**GEOG/SUST 491: Rural Sustainability in Central Italy (UBC Okanagan) »** Experiential 3-week course exploring the historic and contemporary connections between local food and wine and the tourism industry in the rural countryside of Tuscany. Within a framework of sustainability, students participate in local food and wine production and agritourism consumption.

This course fits with UBC’s growing focus on sustainability and the international transferability of those concepts. Lessons from Tuscany, where traditional and typical food and wine systems have combined with tourism to sustain the rural countryside can inform local sustainability efforts in British Columbia.

**ENVI551: Landscapes as Complex Social-Ecological Systems: Kluane Lake, Yukon (UBC Okanagan) »** Prepares students to critically assess and analyze the challenges and opportunities related to sustainably managing human interactions with the environment at the landscape scale, within a diverse range of social, cultural, and economic contexts and in consideration of the inherent complexity of human-environment systems.

Using the Kluane Lake region, Yukon Territory as a study area, the program explores how historical and contemporary interactions between humans and the environment have shaped the present landscape.

The field component of the course covers present-day perspectives and visions of the landscape and use by different groups, as well as historical and contemporary natural resource management governance systems and approaches by First Nations, Parks Canada, and the territorial government.



## FEATURE STORY

### ĆELÁÑENEL: A field course in the re-emergence of W SÁNEĆ law

Professor Robert YELKÁTTE Clifford of the Peter A. Allard School of Law, a member of the Tsawout First Nation – one of five communities that make up the W SÁNEĆ on Vancouver Island – is focused on the revitalization of Indigenous legal traditions, specifically as it relates to his own community of W SÁNEĆ.

“While my work speaks to the broader revitalization of Indigenous law, it has always been rooted in W SÁNEĆ and grounded by the teachings, responsibilities, and care taught to me by my family, as well as associated with the name I carry – YELKÁTTE,” explained Professor Clifford, whose name was passed on to him by his late grandfather, Dr. Earl Claxton Sr. (YELKÁTTE), a respected elder of the Tsawout First Nation.

Professor Clifford’s innovative semester-long intensive field course provides students with the opportunity to engage as community-based learners. Students work directly with W SÁNEĆ elders and knowledge holders on projects such as place restoration and reclamation work, the creation of a W SÁNEĆ woman’s land trust, a new W SÁNEĆ Southern Resident Killer Whale Guardian program, and a variety of other projects that seek to uphold W SÁNEĆ laws, interests, and responsibilities while also grappling with municipal, provincial and federal legal structures entangled with many of these initiatives. The field course advances seven different community projects per year in the spirit of service to the community. At the end of the course, students present and engage in discussions with one another and community members related to their eight-week placement experiences.

“I am interested in understanding W SÁNEĆ law and how it functions, on its own terms, as well as theorizing how the revitalization of W SÁNEĆ law can happen given the dynamics of colonialism and climate change,” said Professor Clifford. In addition, Professor Clifford also teaches Indigenous Law and Climate Change, Aboriginal & Treaty Rights, and Indigenous-Settler Legal Relations to JD students at UBC.

ĆELÁÑENEL: A Field Course in the Re-emergence of W SÁNEĆ Law – offered in partnership with the W SÁNEĆ Nation and the University of Victoria, Faculty of Law – is an example of the important intersection between Indigenous rights and climate justice, and demonstrates the commitment in UBC’s Climate Emergency Task Force report to supporting climate leadership and initiatives led by Indigenous, Black and People of Colour.



# Climate Emergency Response

In response to the urgency of the global climate crisis and years of persistent student-led advocacy, UBC declared a Climate Emergency in 2019. Following a year of extensive community engagement, the UBC Board of Governors endorsed the Climate Emergency Task Force (CETF) final report and recommendations in February 2021 to advance justice-based climate action, equitable development, and resilient communities. A separate report on CETF Progress 2021-22 charts developments over the past year.

**CETF Implementation Underway »** While the implementation of the CETF report is a shared responsibility across UBC, the Sustainability Hub is responsible for coordinating and convening this work. Two new Senior Climate Emergency Co-Managers together with the whole team at the Sustainability Hub are collaborating with UBC’s climate action leaders and many others to achieve greater impact.

**Climate Emergency Fund inspires collective action »** Grants from a \$1.5 million fund were awarded to seven projects based on student-chosen CETF priorities.

**Centre for Climate Justice opens »** An interdisciplinary initiative to advance transformative social, political, and economic changes necessary to address the climate crisis and other environmental injustices while advancing equity and addressing ongoing oppressions.

The Centre conducts collaborative, interdisciplinary, and community-engaged research across diverse knowledge systems and geographies to meet the demands for climate justice within and beyond UBC.

**New applied research and teaching in the community »** As a result of the CETF report, additional activities by faculty and students to support climate action in the community include:

- A new 3-credit field course pilot, developed by Sustainability Fellows Dr. Rob Kozak and Dr. Stephen Sheppard, supports local residents and youth to design and install small climate action projects to tackle the climate emergency in their own neighbourhoods.

- 52 graduate students in the Sustainability Scholars Program delivered applied research projects supporting local municipalities to achieve their climate action goals.

**Public engagement and outreach expands »** Climate Emergency Response activities by the Sustainability Hub and many collaborators across UBC engaged student, faculty and staff audiences, in addition to national and international audiences.

- **Climate Justice Series** – A series of webinar, hybrid, and in-person public events to elevate climate justice literacy enjoyed by over 1,200 attendees.
- **UBC at COP26** – UBC’s first open and transparent selection process for a limited number of observer badges for the United Nations Framework Convention on Climate Change Conference of the Parties (UNFCCC COP). From 72 applications, a selection committee agreed on a group of eight faculty, staff, and student delegates from a wide range of disciplines and backgrounds.
- **Association for the Advancement of Sustainability in Higher Education (AASHE) Webinar** – An interactive session to connect people from universities across North America on climate emergency activities.
- **Art and Advocacy** – Engaging an interdisciplinary cohort of scholars in climate story-telling during a weekend workshop by the UBC Climate Hub focused on the intersections between art, activism, and advocacy.
- **Climate Slamposium** – A student climate research slamposium featuring nine interdisciplinary graduate and undergraduate students sharing climate research in creative ways to over 80 attendees.

## FEATURE STORY

### Climate Emergency Week

In the spirit of urgency, care, and community, the Sustainability Hub, Climate Hub, and Alma Mater Society (AMS) hosted a week of campus-wide engagement, action, and celebration events.

Lighting up Martha Piper Plaza fountain red for “Code Red” and #UBCCClimateLove, over 1,000 students were engaged at outreach kiosks to promote a week of events including keynotes from Dr. Ingrid Waldron, HOPE Chair in Peace and Health in the Global Peace and Social Justice Program in the Faculty of Humanities at McMaster University, and Chief Dana Tizya-Tramm of Vuntut Gwitchin First Nation.

Panel and student engagement sessions included UBC administrative and student leaders, and openings and closings from xʷməθkʷəy̓əm Elder Larry Grant and knowledge keeper Victor Guerin. Student leaders Em Mittertreiner (Co-Student Director, UBC Climate Hub), Tashia Kootenayoo (President, Students’ Union Okanagan of UBC ), and Eshana Bhangu (VP Academic and University Affairs, AMS, and UBCV Student Senator) made impassioned pleas for full support of student initiatives and funding commitments on climate action.

Events throughout the week were made possible thanks to the generosity of our Host Nation the xʷməθkʷəy̓əm people, and funding from the Pacific Institute for Climate Solutions (PICS) and the UBC Wellbeing Strategic Initiatives Fund.



VANCOUVER

3,090

attendees at public climate education events

VANCOUVER

458

participants in climate action workshops

OKANAGAN

218

participants in Climat Action Plan 2030 engagement activities

OKANAGAN

100+

students, faculty and staff engaged at Climate Teach in Event





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## FEATURE STORY

### Ripples of Transformation

The health and wellbeing of our planet is inherently linked to the availability of safe clean waters. And for Indigenous peoples, water has often been respected as a transformer: wielding the power to both harm and to heal. Many of the lessons for respecting the transformative power of water comes from stories, songs, prayers and ceremonies. These teach us ways for living and being in alignment with our more-than-human relations.

As a way to mark World Water Day and the connections between us – the Sustainability Hub and Centre for Sustainable Food Systems at UBC Farm invited guests from across the UBC community and our host Nation to the yurt at UBC Farm to collectively reflect on the songs and stories of transformation that will support the creation of new (and re-newed) pathways for sustainability and climate justice.

Three Indigenous scholars – Dr. Danielle Ignace, Dr. Shandin Pete, and Daqualama (Jocelyn Joe-Strack) – opened a circle in search of stories to help us restore and re-story our world and our relationships with it.

Dr. Shandin Pete, Assistant Professor, Earth, Oceans and Atmospheric Sciences, shared a story on learning, teaching, and growing in our role(s). Ending his story with a song from his people, Shandin explained that singing is a vital piece of data for understanding Indigenous land- and water-scapes.

Dr. Danielle Ignace, Assistant Professor, Forestry and Conservation Sciences, offered a reminder that we have everything we need inside of us. She reflected on the ability for a single seed to flourish with knowledge and information from its 'parents' and a nurturing environment, and the significance of water cursing through that growth.

Daqualama engaged the audiences in stories about answering the call from ancestors. From a story about a glacial lake in the Yukon from long ago, to one about visiting Kusawa Lake with her daughter, Daqualama illustrated her motivation to step forward in a way that honours the love for her people and her lands.

Participants in the circle spoke about their journey from head to heart, experience that drew attention to respecting multiple ways of knowing and being on the land, and the power of reconnection as climate action.



## Sustainability Scholars Program

An innovative paid internship program that matches graduate students with on- and off-campus partners to work on applied research projects that advance sustainability. Projects explore topics such as emissions reduction, food security, sustainable transportation, green buildings, biodiversity, climate change, circular economy, and social sustainability.

**Understanding Indigenous housing governance practices, principles, and policies »** Research that developed an open-access toolkit to serve First Nations across the Pacific Northwest as they navigate the creation and management of housing governance options for their communities. The toolkit includes an overview to better understand the housing system, a critical examination of why the current system does not work, and solutions for innovative community-centered housing governance models that are based in cultural wellbeing, economic security, and environmental sustainability.

**Exploring project ownership models for renewable electricity generation in remote, Indigenous communities »** This project investigated different ownership models for renewable energy projects involving Indigenous communities in Canada. The ownership models are presented through case studies of past and current projects with the majority of cases focused on remote renewable energy projects. The report presents and explains different ownership models and their uses, and explores common themes important to the success of projects in partnership with a First Nation or Indigenous community.

**Informing municipal progress on equity and social justice »** Over the past three years, the Sustainability Scholars program has added focus on addressing racial and social justice issues in tangible ways. Three of BC’s largest cities have worked with Scholars to produce equity frameworks to mitigate the disproportionate climate impact on marginalized and vulnerable populations.

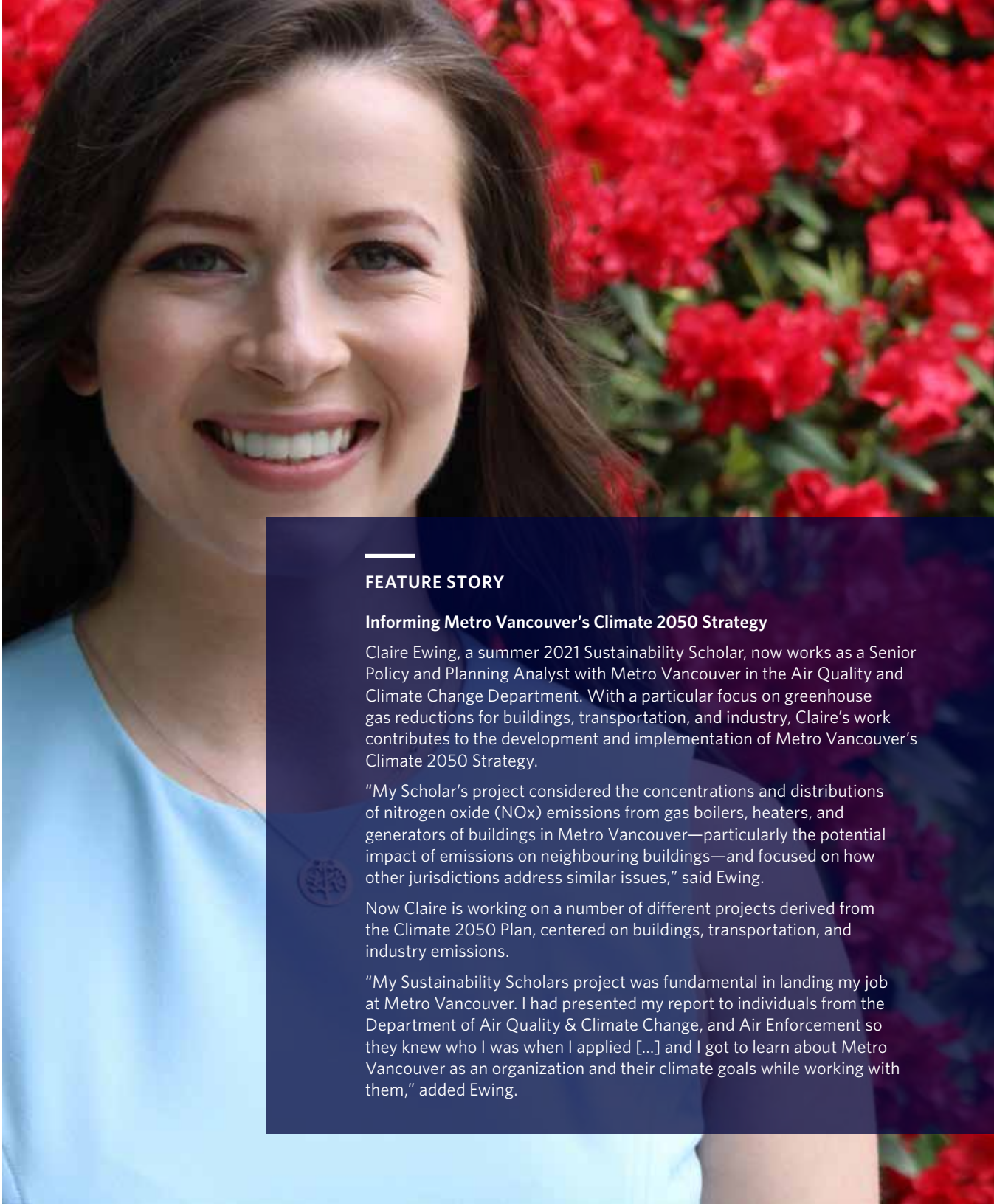
Building on work produced by Sustainability Scholars over the past 4 years, the City of Vancouver continues to develop and implement improvements to research related to 2SLGBTQQIA communities in ways that respond to decolonization, reconciliation and equity in research.

In New Westminster, Scholar’s research is laying the foundation for a climate equity framework to guide municipal climate action and establish climate equity indicators. Energy poverty profiles for the City of Abbotsford and the District of Saanich will inform the development of new climate action plans and policies to reduce GHG emissions.

**Accelerating Vancouver’s economic transition to a zero-carbon future »** The Vancouver Economic Commission (VEC) was tasked by the City of Vancouver’s Climate Emergency Action Plan to develop an economic plan that supports businesses and workers to successfully and prosperously decarbonize. A Scholar’s research this year has directly informed VEC’s response, most recently the Zero Emissions Economic Transition Plan (ZEETAP) – which includes implementing Scholar’s recommendations to develop a regional Just Transition Council.



Sustainability Scholars reporting data represents the fiscal year 2021-22.



### FEATURE STORY

#### Informing Metro Vancouver’s Climate 2050 Strategy

Claire Ewing, a summer 2021 Sustainability Scholar, now works as a Senior Policy and Planning Analyst with Metro Vancouver in the Air Quality and Climate Change Department. With a particular focus on greenhouse gas reductions for buildings, transportation, and industry, Claire’s work contributes to the development and implementation of Metro Vancouver’s Climate 2050 Strategy.

“My Scholar’s project considered the concentrations and distributions of nitrogen oxide (NOx) emissions from gas boilers, heaters, and generators of buildings in Metro Vancouver—particularly the potential impact of emissions on neighbouring buildings—and focused on how other jurisdictions address similar issues,” said Ewing.

Now Claire is working on a number of different projects derived from the Climate 2050 Plan, centered on buildings, transportation, and industry emissions.

“My Sustainability Scholars project was fundamental in landing my job at Metro Vancouver. I had presented my report to individuals from the Department of Air Quality & Climate Change, and Air Enforcement so they knew who I was when I applied [...] and I got to learn about Metro Vancouver as an organization and their climate goals while working with them,” added Ewing.



# SEEDS Sustainability Program

Creates applied student-led research and interdisciplinary partnerships between students, faculty, staff and community. An internationally recognized Campus as Living Laboratory initiative, SEEDS helps advance UBC’s sustainability and wellbeing commitments, supports the integration of academic and operational sustainability efforts, and contributes to enriched student, research and professional experiences through five research priorities representing key interconnected societal issues.

**Campus research supports biodiversity, climate adaptation and resilience »** Students from the Faculty of Forestry undertook a series of applied research projects aimed at increasing understanding of biodiversity at the UBC Vancouver Campus. Research resulted in the development of a new campus tree inventory database to classify and record the remaining campus urban forest. Additional student-led projects helped to improve the accuracy of the database, as well as incorporated biodiversity and social value data to inform the design and management of greenspaces.

**UBC’s first campus ecological connectivity map »** In related research, students used climate and tree canopy cover data to model the relationship between climate change and urban forests in ways that can inform planning decisions related to climate adaptation and resilience, including the cooling effects of urban forests, while other teams completed research based on mycorrhizal fungal networks to assess the structural and functional connectivity of spaces, including ways and degrees to which spaces are connected or not,

and biodiversity levels in “green” spaces. Combined, these research projects resulted in the creation of UBC’s first campus ecological connectivity map – a tool which can be used to improve structural and functional connectivity between campus green spaces.

The findings and deliverables will inform the future design and management of campus green spaces, including ways to preserve and enhance the diversity of ecological life on campus, as well as community climate adaptation and resilience.

**Student-led research puts food systems at heart of climate action »** A series of SEEDS student research and interdisciplinary collaborations directly informed commitments to reduce food system related emissions in UBC’s new Climate Action Plan 2030 (CAP 2030).

Specifically, the Climate-Friendly Food System Action Team developed a target to achieve a 50% reduction in campus food systems emissions by 2030 vs. 2019, and seven supporting actions spanning climate change mitigation and adaptation.

**Reducing Greenhouse Gas Emissions from UBC Intercampus Air Travel »** To support UBC’s net zero emissions targets at both campuses, research explored the behaviours and motivations of UBC staff and faculty who travel the intercampus corridor between Vancouver and Kelowna by air for university-related activities.

The study highlighted stakeholder’s concerns about this issue which included climate impact, equity, social cues, productivity, accessibility, convenience/ cost, networking, and technology challenges. Findings informed a CAP 2030 target to achieve a 50% reduction in business air emissions from pre COVID-19 levels by 2030, and included recommendations for a new UBC air travel policy.

VANCOUVER

19

UBC sustainability plans and policies advanced

VANCOUVER

739

students, faculty, staff and community partners engaged

VANCOUVER

104

applied research reports

VANCOUVER

7

knowledge mobilization and engagement events

SEEDS reporting data represents the academic year September 2021 to August 2022, not fiscal year 2021-22.



## FEATURE STORY

### Climate Friendly Food Label pilot launches

A SEEDS collaboration between students, faculty and staff resulted in UBC’s first ever Climate-Friendly Food Label pilot. Launched to inform “climate-friendly” purchasing choices, the food labelling pilot features an innovative methodology to assess the GHG emissions, nitrogen and water use associated with over 1,600 campus menu items in order to indicate the climate-friendliness of meals.

The pilot also included an evaluation of consumer awareness, perceptions, and impact on knowledge and purchasing decisions, and work is ongoing to evaluate and optimize the labels based on customer feedback. Based on analysis of sales data and over 1,000 participant responses, results show that climate-friendly labelled “green” pizzas were chosen more, and that the majority of customers (84%) want to see the labels in all restaurants on campus.

According to Yu Luo, a PhD Candidate in the Department of Psychology who led the evaluation in Phases 1 and 2, food labelling shows significant potential.

“Given the positive evidence found in this project, it is promising that implementing the climate-friendly food system labels on campus can have a significant impact on lowering UBC’s GHG emissions over the next 10 years to meet the target of achieving a 50% GHG emission reduction of food systems,” said Luo.



## Student Engagement

Student engagement is at the heart of sustainability learning at UBC. Through immersive, transformative, and experiential learning, our engagement programs provide opportunities to build leadership skills and professional competencies. Whether it's collaboration, connections, or peer mentoring, we offer diverse opportunities to meet a variety of student needs and interests.

**Sustainability Ambassadors highlight climate justice, biodiversity, and waste issues »** 25 Ambassadors from eight faculties and 21 different programs delivered events and programming including a hybrid online and in-person Sustainable Development Goals Week, a sustainability data visualization camp focused on waste and recycling, a social justice storybook website, and an educational video on climate change and biodiversity.

**Workshops teach leadership skills to student groups across campus »** The Sustainability Hub offered learning workshops and facilitated sessions to various communities on campus, including student residence, student groups, and student clubs. Topics included the Sustainable Development Goals; Power, Privilege and Sustainability; and Authentic Leadership in the context of Sustainability and Climate Anxiety.

**Student Sustainability Council provides input on emerging plans »** Leaders from 22 student groups gave input on eight staff-led projects and six student led-projects, including UBC's emerging new Zero Waste Action Plan and a student-led effort to implement a new textile collection and recycling service.

**IBPOC student consultation informs new programming »** In-person consultations and surveys with campus community members. The key outcomes and recommendations from this report will inform new engagement actions by the Sustainability Hub.

**UBCO Go Global Sustainable Travel Seminars »** New seminar series for students planning to study abroad, including focus on housing, wellness and sustainable travel. Students travelling abroad, or international students traveling to UBCO, have the option to calculate greenhouse gas emissions related to their travel and opt into carbon offset projects (e.g. investments in biomass as an energy source).



### FEATURE STORY

**Climate and Collective Liberation Project »** Michelle Xie is an undergraduate sociology student, Sustainability Ambassador, and community organizer of Chinese descent who was born and raised on the traditional territories of the xʷməθkʷəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and səliłwətaʔt (Tsleil-Waututh) peoples. As a young racialized and disabled woman, her perspectives are shaped by the intergenerational legacies of colonialism, war, and oppression she has witnessed within her communities.

As part of a team of three Sustainability Ambassadors, Michelle developed an online community resource for climate justice and collective liberation. Each section of this resource includes a research, storytelling, and action component, and offers a starting point to explore what it really means to say, 'climate justice is social justice.'

"Sarnia, in Ontario, which has been dubbed Cancer Valley, is home to one of the world's largest toxic waste sites and responsible for 40% of Canada's chemical industry. It's concentrated within this one area that's very close to racialized and indigenous communities.

We are bringing attention to the issue, and doing so in a way that relates to storytelling and the power that people's experience has in communicating things beyond statistics and news headlines to make things more real and more pressing." – Michelle Xie, Sustainability Ambassador.

## Student Leadership

UBC students are leading change across our campus, and in our communities. By self-organizing and speaking out, student groups take the initiative to spark meaningful conversations – often about what UBC itself can do differently. Addressing issues like the climate crisis, social and racial justice, student wellness and more, student leaders at UBC are making a positive contribution to sustainability.

**AMS opens new sustainability space in the LIFE Building »** Features a dashboard of AMS environmental metrics, sustainability-related books, and furniture created from recycled chopsticks from a campus cafe.

**Climate Cafés build community, connection, and hope around climate change »** Safe spaces for students to have conversations about how they are experiencing climate change, and to share uncertainties. Hosted by the Sustainability Hub, UBC Climate Hub, and AMS.

**Climate Ambassadors engage 900 school students »** High school youth mentored by UBC Climate Hub delivered climate education workshops in 15 schools across BC, Alberta, and Ontario, reaching 900 pupils ranging from grade five to grade 12.

**Climate Engagement Wellbeing Network expands »** UBC Climate Hub offered 10 workshops to eight different departments and organizations including UBC Counselling, UBC Geography, and Parks Canada.

**Student experts deliver new lectures through Climate Teaching Connector »** Climate expert students delivered 31 guest lectures to more than 1,700 students across 18 UBC Vancouver and Okanagan departments, with positive feedback from instructors and students.



### FEATURE STORY

**Climate Emergency Town Hall attracts community leaders »** With momentum for climate action growing across UBC and beyond, a spontaneous emergency town hall asked, "With BC on the frontlines of climate breakdown and fossil fuel extraction, how do we keep us safe?" "What justice-based plans will shift us into emergency footing?"

Community leaders gathered at the AMS Nest at an event organized by the Centre for Climate Justice, student-group Climate Justice UBC, and the UBC Climate Hub. Guest speakers included Anjali Appadurai (Sierra Club BC), Avi Lewis (UBC Department of Geography), Naomi Klein (Centre for Climate Justice), Kanahus Manuel (Secwepemc / Ktunaxa / Indigenous Land Defender), Kai Nagata (Dogwood Initiative), and Chief Ninawa Huni Kui (President of the Federation of the Huni Kui people in Acre, Brazil).

"It's so important, in the midst of escalating climate crises, to be able to come together as a community and process it all. We hosted the town hall as a space for the community to process the devastating floods and violent attacks on Wet'suwet'en in light of the climate crisis. But we also hosted it as a way to find hope in our power. UBC as an institution has so much power - in its research capacity, in its funds, and in its social reach - to address the climate emergency, and this town hall gave us direction in how we can use it. I'm really grateful for the support of the Sustainability Hub in making this event, and student-led community events like it, a reality." – Anna Brookes, Climate Justice UBC

VANCOUVER

1,700

students received climate education through Climate Teaching Connector

VANCOUVER

900

school-age children taught by student Climate Ambassadors



# Campus Engagement

Engagement programs for students, staff, and faculty support the implementation of UBC’s climate action and sustainability plans, and help advance a culture of sustainability. Our goal is to inspire and mobilize campus community members in order to build a resilient, interconnected community that is empowered to take climate action and create a more sustainable campus and world.

**New and expanded programs to reduce emissions from commuting, food, waste, and business air travel »** For the first time, UBC’s Climate Action Plan 2030 explicitly commits to reducing emissions from extended impact emission sources where UBC has indirect influence and control — these include emissions from UBC-related commuting, food systems, waste and materials and business air travel.

Supporting the campus community to achieve these reductions involves the creation of new – and expansion of existing – engagement programs, campaigns and resources to build capacity and strengthen networks of sustainability champions on campus. CAP 2030 engagement in Vancouver (764 participants) and in the Okanagan (218 participants) is fundamental to guiding this work.

**UBC Reads Sustainability – free public events draw 300+ »** The Sustainability Hub organized free public events with authors in partnership with on-campus groups including the Morris and Helen Belkin Art Gallery, Centre for Community Engaged Learning, and Pacific Institute for Climate Solutions.

Readings from high profile authors included Dallas Hunt *Creeland*, and Aja Barber *Consumed*, and were enjoyed by over 300 attendees.

**Training, funding and competitions for community members returning to campus »** Activities to enhance campus sustainability this year included:

- Supporting over 100 Sustainability Coordinators from 67 departments, units and laboratories to promote sustainable practices and behaviours in the workplace
- Workplace Sustainability Grants to sustainable innovations in five departments, including the UBC

Library, Centre for Blood Research/OBMS, Go Global and the Office of the Vice Provost International, the School of Information, and Department of Asian Studies

- The relaunch of the Zero Waste Squad – a peer-to-peer student engagement program supporting waste reduction and the circular economy – included training 34 new members and a total of 279 volunteer hours contributed towards engaging the campus community about zero waste
- The Shut the Sash competition engaged labs in Chemistry D and E over six weeks to determine who could conserve the most energy from shutting fume hood sashes – saving an estimated 98,000 kWh
- A Green Labs Fund award to a lab in the Department of Cellular and Physiological Sciences to design, build and test a multi-nozzle cleaning system to clean plastic drosophila (fruit fly) vials, avoiding single use options
- An update to UBC Okanagan Undergraduate Chemistry curriculum to reduce hazardous waste from experiments with the use of simulations, apps and videos, funded by Green Labs
- The Amber Glass Recycling Program diverted approximately 3,000 kg lab glass from landfills
- Relaunched in early 2021, the Lab Plastics Recycling Program engaged an additional 23 new labs this year
- Nitrile Glove Recycling Program collected over 450kg of gloves for recycling
- A Green Labs funded new Atomic Absorption Spectrometer in the Chemistry Department at UBC Okanagan saved 30% energy cost savings, reduced inputs and waste
- The Ice Pack Donation Program diverted over 5,000 ice packs from landfill through collaboration between the Life Sciences Centre, and local grocers Spud

**The Power of You (Okanagan) »** UBC Okanagan’s behaviour change program, The Power of You, offered virtual and on-campus initiatives with a focus on energy conservation and sustainable, active modes of transportation. Engagement activities this year included:

- The 2nd Annual Shut the Sash Challenge saved 33,031 kWh, 123 GJ and 7.5 tCO<sub>2</sub>e in energy and emissions, and engaged over 40 students
- A building audit resulted in over 1,735 lights and 10 projectors/ screens being turned off or powered down to conserve energy

## FEATURE STORY

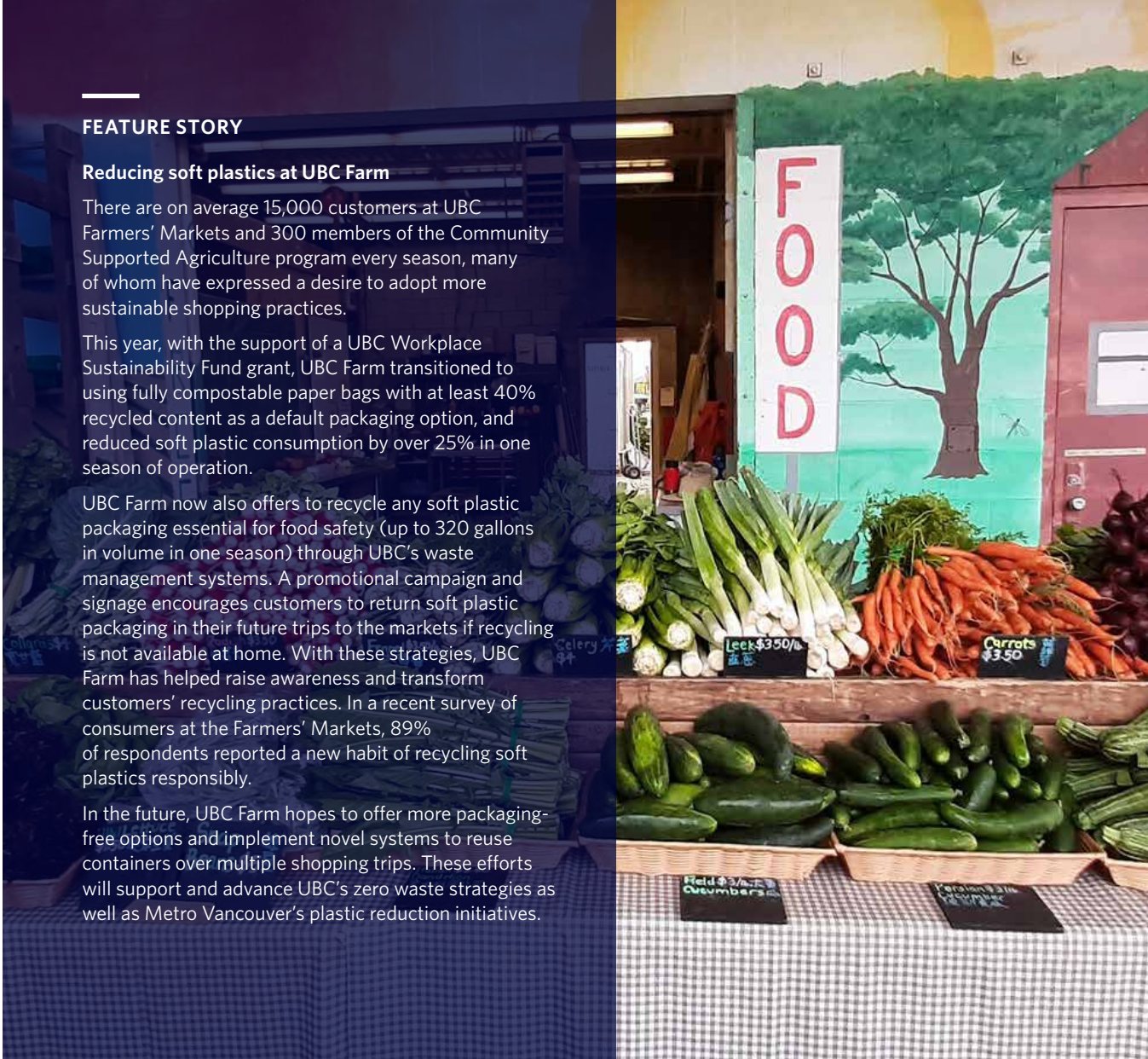
### Reducing soft plastics at UBC Farm

There are on average 15,000 customers at UBC Farmers’ Markets and 300 members of the Community Supported Agriculture program every season, many of whom have expressed a desire to adopt more sustainable shopping practices.

This year, with the support of a UBC Workplace Sustainability Fund grant, UBC Farm transitioned to using fully compostable paper bags with at least 40% recycled content as a default packaging option, and reduced soft plastic consumption by over 25% in one season of operation.

UBC Farm now also offers to recycle any soft plastic packaging essential for food safety (up to 320 gallons in volume in one season) through UBC’s waste management systems. A promotional campaign and signage encourages customers to return soft plastic packaging in their future trips to the markets if recycling is not available at home. With these strategies, UBC Farm has helped raise awareness and transform customers’ recycling practices. In a recent survey of consumers at the Farmers’ Markets, 89% of respondents reported a new habit of recycling soft plastics responsibly.

In the future, UBC Farm hopes to offer more packaging-free options and implement novel systems to reuse containers over multiple shopping trips. These efforts will support and advance UBC’s zero waste strategies as well as Metro Vancouver’s plastic reduction initiatives.



VANCOUVER

67

operational and academic departments engaged over fiscal year

VANCOUVER

104

Sustainability Coordinators in offices and labs

VANCOUVER

72

homes worth of energy savings via Shut The Sash Competition

OKANAGAN

32,420

‘Lights Off’ during campaign since 2015



## Research

UBC plays a leadership role among global post-secondary institutions that focus on researching, developing, and demonstrating sustainable practices. With over 400 faculty across two main campuses investigating sustainability, our goal is to excel across the spectrum of fundamental and applied research. The following pages include some examples of new groups and projects – just a small selection from an incredible breadth of work across the university.

**UBC Climate Change Research Symposium »** A 2-day symposium organized by a Task Group convened by UBC’s Office of the Vice-President, Research and Innovation, that brought together, virtually, climate researchers from multiple faculties at UBCV and UBCO, to promote connectivity between clusters of relevant research. Featuring panel discussions and keynote speakers, the symposium helped make connections between clusters and enhance the potential of UBC researchers to impact climate change through research and innovation.

## Featured Research Groups

### UBC VANCOUVER

**Biodiversity Research Cluster »** Comprised of over 70 faculty and post-docs drawn from a broad variety of disciplines, this research cluster will identify global change impacts on biodiversity and suggest ways in which such changes can be ameliorated. An interconnected and interdisciplinary cluster, research covers diverse topics including marine ecology, evolutionary genetics, farming systems, food sovereignty, applied ethics, forestry, plant-insect interactions, fisheries sciences, and many more.

**Diversified Agroecosystems Research Cluster »** Aims to leverage research excellence at the Centre for Sustainable Food Systems and global partners to evaluate diversified agroecosystems. Using ecological and systems analysis perspectives for integrated research on bioenergy, water resources, and food production, members work to maximize crop yields,

improve soil quality and biodiversity, and minimize nutrient losses to the environment.

**Public Humanities Hub »** Established to foster, support and highlight public-facing collaborative research in the humanities in arts, law, and education. Through research cluster funding, seed grants, a speaker series, public scholarship programming, and networking opportunities, the Public Humanities Hub offers support for UBC scholars and external partners to mobilize knowledge in order to address the environmental issues of today.

**Urban Forestry Hub »** An interdisciplinary and applied approach to understanding the social, biophysical and technological aspects of urban forestry. Urban Forestry Hub members partner with non-academic agencies, organizations and communities to inform policy and practice; and consider the relationships between all human and non-human nature, regardless of social, physical, intellectual or sensory conditions.

### UBC OKANAGAN

**Plastic Recycling Research Cluster »** Undertaking highly collaborative research to explore and address the issue of plastic waste from different technological, environmental, management, social and policy-making perspectives in British Columbia and beyond. This research cluster encompasses an interdisciplinary team of researchers from engineering, management, creative and critical studies, and psychology, who are working with industrial partners and municipal and federal government to manage plastic waste systematically.

**Urban Indigenous Wellbeing Cluster »** Responding to urban Indigenous community needs through a holistic approach to spiritual, mental, emotional and physical health. The Urban Indigenous Wellbeing Cluster is an interdisciplinary research collective of Elders, Community Members, partner organizations, and Indigenous and settler researchers and trainees. Team members have experience and expertise in community-led Indigenous research methodologies, Indigenous health, health promotion, identity and belonging, cultural safety, land-based healing, population health, geography, creative practices, occupational therapy, and mental wellness.

## Featured Program

**Campus as a Living Lab »** As a public university, UBC has both a commitment and responsibility to leverage our academic and operational capabilities to respond to global challenges like climate change and the biodiversity crises.

The Campus as a Living Lab (CLL) program provides a collaborative framework for researchers, students, staff and external partners to use our campus to explore, develop and test new ideas, and share the knowledge and learning gained from these experiences for public benefit.

This year the Sustainability Hub managed the second annual CLL Fund Competition – an opportunity that provides seed funding for collaborative applied ‘living lab’ research projects on UBC’s Vancouver campus. Projects must provide both research opportunities and operational benefits, be led by a faculty and staff team, demonstrate innovation, and respond to a sustainability challenge. Four new CLL projects were awarded funding through the competition in 2021.

**The UBC E-Kitchen –** The Repair and Reuse of Electronics at UBC to support the transition to a circular economy with reduced impacts on climate and the environment.

- Dr. Milind Kandlikar, Professor & Director, Institute For Resources, Environment & Sustainability
- Bud Fraser, Senior Planning & Sustainability Engineer, Campus + Community Planning
- Dr. Sathish Gopalakrishnan, Associate Professor, Electrical & Computer Engineering

**Designing Student-Family Housing For Wellbeing –** Research-based design charrettes involve residents in identifying the characteristics and qualities that make Acadia Park a successful community.

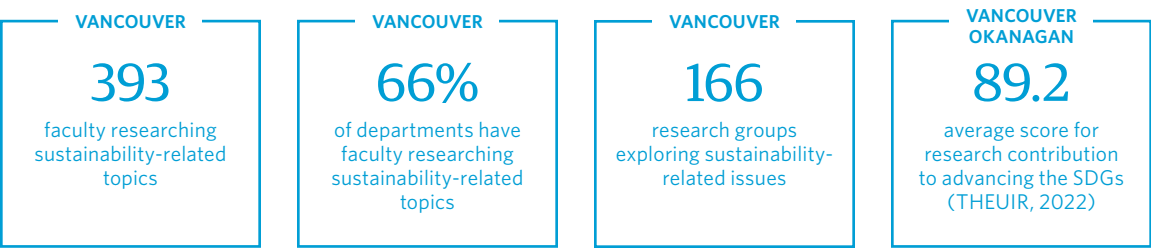
- Dr. Inge Roecker, Associate Professor, School Of Architecture And Landscape Architecture
- Andrew Parr, Associate Vice-President, Student Housing And Community Services
- Dr. Alina Mckay, Post-Doctoral, Researcher, Sociology

**Digital Detection Web For On-Campus Insects –** Integration of remote sensing, machine learning and the Internet of Things to improve insect monitoring and tracking as indicators of climate change and biodiversity impacts

- Dr. Juli Carrillo, Assistant Professor, Faculty Of Land And Food Systems
- Clare Cullen, Operations Director, Centre For Sustainable Food Systems, UBC Farm
- Dr. Quentin Geissmann & Dr. Pierre Girod, Postdoctoral Research Fellows, Microbiology & Immunology, Land & Food Systems

**Nutrients, Energy, And Water Resource Recovery –** A state-of-the art research and teaching facility to advance the development of sustainable technologies that ‘close the loop’ on carbon, nutrients, and water in an urban campus context.

- Dr. Ryan Ziels, Assistant Professor, Civil Engineering
- Jake Li, Green Infrastructure Engineer, Campus + Community Planning





## Coastal Adaptation Lab addressing sea level rise in Metro Vancouver

Sea level rise is expected to cause catastrophic damage worldwide as climate change worsens. Around British Columbia, water levels are expected to rise by 0.5 meters by 2050 and 1.2 meters by 2100; an increase in community displacement, threats to food security and livelihoods, coastal erosion, and biodiversity loss are likely to follow.

UBC's Coastal Adaptation Lab (CAL) aims to develop novel planning, design, and policy solutions for coastal adaptation based on the co-production of knowledge among researchers, decision-makers, and Indigenous communities. The lab integrates research areas including 1) critical infrastructures; 2) coastal habitat squeeze, 3) nature-based solutions, and 4) managed retreat, all within the overarching envelope of climate and spatial justice.

The Fraser River Delta, in particular, is a region where sea level rise could have severe consequences. The delta is home to an ever-growing human population of nearly 3 million, it hosts critical habitats for marine life and migratory birds, and has emerged as a key economic and logistical location within the Pacific Rim. A recent CAL initiative, known as the Fraser River Delta Collaborative, investigating the impacts of sea level rise in the area found that a single flood event could cause \$20 billion in economic loss, and put over 100 species at risk of extinction. The team, consisting of the Coastal Adaptation Lab and four Vancouver-based landscape architecture firms, analyzed how designers can support planners and policymakers and found that coastal adaptation will require both large-scale and localized planning and design efforts for both the short and long term.

Other UBC CAL projects include Clam Gardens, the Future of False Creek, Visualizing the Future Port of Vancouver, and the Living with Water project. The latter, supported by a \$1 million, four-year grant from the Pacific Institute for Climate Solutions, seeks to identify coastal erosion mitigation strategies by drawing on global case studies and conducting experiments along coastal sites at UBC's point Grey Campus.

"Coastal ecosystems such as wetlands and salt marshes provide natural buffers against waves and flooding, provide habitat for keystone species, and support coastal livelihoods. We need to develop frameworks to help coastal communities understand and evaluate the trade-offs associated with adapting in place (reinforcing/protecting existing shorelines), accommodating water or making a strategic retreat to higher grounds." Dr. Kees Lokman, professor in the School of Architecture and Landscape Architecture, and director of the UBC Coastal Adaptation Lab.





### Canada Climate Law Initiative advises business and government leaders on climate change risks

For many organizations, responding to climate change requires an in-depth understanding of Canadian and international policies in order to meet the obligations of a dynamic regulatory environment.

In support, researchers at the Canada Climate Law Initiative (CCLI) and affiliated scholars generate interdisciplinary knowledge and provide accessible guidance through presentations on climate governance, conservation finance and management, corporate law and governance, Indigenous partnerships in sustainable business, and advancing a green recovery and circular economy.

Led by principal investigators Dr. Janis Sarra, Dr. Carol Liao and Terri-Lynn Williams-Davidson from the Peter A. Allard School of Law, and Professor Cynthia Williams and Dr. Barnali Choudhury from the Osgoode Hall Law School, York University, CCLI also makes recommendations to regulators and governments at the provincial and federal levels: for example consultation on Bill C-97 – amendments to the Canadian Business Corporations Act in March 2021.



### LiteFarm application supports sustainable farming in 120+ countries

LiteFarm is a community-driven, free, not-for-profit, and open-access software application from UBC's Centre for Sustainable Food Systems (CSFS) that brings scientists and farmers together to address issues related to climate change, biodiversity decline, and the production of healthy and nutritious food.

The application was co-created by a coalition of researchers, farmers, designers, developers, and students at UBC as part of the Diversified Agroecosystem Research Cluster. Features include an ever-expanding crop catalog that provides farmers useful data, an organizer that helps farmers plan crop management at a day-to-day level, and a documentation generator that helps streamline the organic certification process.

Now used in 120+ countries, at 2,200+ farms, and by 2,600+ users, the app is built to both help individual farmers with their day-to-day operations, and to support the wider farming community by identifying more sustainable farm management practices.



### Wine Research Centre supporting a healthy Canadian viticulture industry

How can wine production become more sustainable as climate change-related heatwaves and droughts intensify?

The UBC Wine Research Centre (WRC) supports Canadian winegrowers through cutting-edge research in enology, viticulture, management, and social sciences, combined with extended industry education and community engagement on climate change and other related issues.

Dr. Simone Castellarin, Associate Professor in the Faculty of Land and Food Systems and Associate Director of the WRC explains. "Irrigation is needed in many vineyards and is one of the strategies we have to mitigate the effects of heatwaves. But it uses freshwater – a vital resource. So the focus of my laboratory is to study how we can maintain the plant under what we call a regulated water deficit, in order to save water, but also to improve the quality of the fruit."

With grape production set to expand in BC, the careful use of irrigation as well as the adoption of new practices to manage soils and canopies will support a sustainable future for the industry.



### Insect forecasting used to pilot pest alerts for growers in Vancouver

Advanced monitoring of insects is a relatively new technology. Entomologists traditionally catch insects in traps, then count and identify them by hand, which is time consuming and doesn't allow for real-time monitoring.

Now researchers are setting up 60-70 unique cameras – known as Sticky Pi – that combine optics and a sticky trap. They catch bugs and record images of them. Computers then use artificial intelligence to determine exactly what the insects are, and where and when they were trapped in real-time.

"By creating real-time data for the public, UBC will serve as an early alert system for monitoring insects pests – these maps and pest alerts will be communicated to growers and other agricultural stakeholders across Canada." Dr. Quentin Geissmann, postdoctoral research fellow in microbiology and immunology and the faculty of land and food systems, and co-lead of the Sticky Pi project.

Researchers plan to deploy the camera system across Vancouver in 2023.



### Generating sustainable chemical fuels from sunlight for a Net Zero future

Inspired by natural photosynthesis, a team of researchers hope to develop low-cost semiconductors to produce hydrogen as a chemical fuel from water and sunlight. This artificial photosynthetic process – known as photocatalytic water splitting – offers a way to harness solar energy in chemical bonds, making storage and handling simple in comparison to traditional photovoltaic solar cells.

SolarSpec, a research lab at UBC Okanagan led by Dr. Robert Godin, aims to understand the photophysical and photochemical processes that dictate the efficiency of solar fuel producing systems. The team uses advanced time-resolved optical spectroscopy techniques that investigate the influence of key physical and chemical parameters, and using that knowledge, aim to optimize material synthesis.

The development and commercial viability of sustainable solar fuel production is critical to reduce emissions in hard to decarbonize sectors that still rely on fossil fuels, such as agriculture, aviation, and shipping.



### Improving the use of life cycle assessments (LCA) for quantifying embodied carbon

Embodied carbon refers to the GHG emissions attributed to materials throughout their entire life cycle – from extraction to end of life. As emissions from buildings' operational energy consumption falls, embodied emissions from construction materials are becoming more significant, however the industry lacks a standardized methodology to account for them.

To address this gap, the Urban Innovation Research team at the Sustainability Hub has completed a multiyear study, including 17 LCA assessments using a variety of data sources and tools on 11 buildings. The results will help establish consistent and reliable industry practice, and have the potential to inform policy on embodied carbon.

The team worked closely with key organizations with expertise on LCA and embodied carbon: partners including Athena Sustainable Materials Institute, Zero Emissions Building Exchange (ZEBx), the National Research Council Canada (NRC) (specifically through the LCA<sup>2</sup> initiative), UBC's Campus + Community Planning department, and the City of Vancouver.





## Renewable Energy Hub: a city scale testbed

The second largest source of GHG emissions in Canada, the transportation sector accounted for 24% of total emissions in 2020.

Led by Mérida Labs and driven by Applied Science researchers, the \$23 million Renewable Energy Hub is transforming the area around Thunderbird Parkade – a whole city size block – into a smart energy district that includes charging infrastructure for electric vehicles, a solar array system, data analytics managed by 5G network, and a hydrogen production and refueling station for both light and heavy-duty vehicles.

So far, the installation of the electric vehicle fast charging station and a battery energy storage system at Thunderbird Parkade is complete. Now the team is constructing a Hydrogen Hub – including an electrolyzer for splitting water into hydrogen and oxygen through electrolysis, a hydrogen compressor and storage tank, and a hydrogen fuelling station. A secure 5G wireless technology platform will connect the system's components to each other and other on-campus systems and assets, including renewable power sources – notably an array of solar panels on top of the Thunderbird Parkade.

The Renewable Energy Hub is a cumulation of the latest renewable technologies, connecting and sharing information in ways that support the transition to a low carbon energy and transportation economy. Industry and government partners include Transport Canada, BC Hydro, Fortis BC, BC Ministry of Transportation, NSERC, Siemens, Rogers, City of Surrey, and many others.



### \$1.9 million investment in Cleantech Hub to repurpose waste materials

In January 2021, Western Economic Diversification Canada announced \$1.9 million in funding to establish a state-of-the-art research facility at UBC Okanagan. The Cleantech Hub, led by Dr. Lukas Bichler, will advance clean technologies that convert industrial by-products into high-quality components and new sustainable products.

Researchers will work with manufacturing, mining and lumber companies in Western Canada to measure the structure, purity, high-temperature behavior and thermo-electric properties of materials. This understanding is key to developing new procedures and manufacturing techniques that enable materials originating from recycling, waste and by-product streams to be repurposed as high-value commodities. In one example, the carbon collected during the recycling process of heavy industry vehicle tires will be converted into battery electrodes to power electric vehicles.

This project will also support the creation of jobs that are inclusive to women, youth and Indigenous peoples through culturally appropriate recruitment and local community outreach activities.



### Mining Microbiome Analysis Platform: a genetic database for sustainable mining

Demand is increasing rapidly for the minerals and metals that are the foundation for renewable energy generation, storage and broader use.

The Mining Microbiome Analysis Platform (MMAP), led by Teck Resources in partnership with UBC and Canada's Digital Technology Supercluster, aims to support more sustainable growth by creating the first integrative platform for collecting, storing, and analyzing the genomic data of water, soil and rock environments. Collecting samples from more than 15,000 mining sites, a microbes and geochemical online data library will be built over the next 2 years as scientists extract DNA from mining-site samples and identify microbes that can be used to implement microbial-based resource extraction and new mine-site bioremediation processes.

In the future, MMAP will enable Canadian and international mining companies to implement sustainable mining practices on a global scale, by replacing energy and chemical-intense resource extraction methods, and by improving the cleanup techniques used at mining sites.



### Drones deliver more equitable healthcare to rural and remote Indigenous communities

A demonstration project uses drones to carry healthcare supplies and medications between the Village of Fraser Lake and Stellat'en First Nation and is acquiring accreditation to transport laboratory samples.

Currently, health care delivery requires the patient to travel to access care. Whereas, drones, along with virtual care, can provide timely health services to individuals so they can thrive in their homes and only travel as required. The project navigates the 'how tos' of integrating new technology into the local and regional health ecosystem, and supports the key partnerships and engagement activities necessary to promote implementation success.

The initiative was established by the UBC Faculty of Medicine, and the study is conducted in partnership with the local host communities and local and regional health system partners including First Nations Health Authority, the Rural Coordination Centre of BC, LifeLabs, Carrier Sekani Family Services, Village of Fraser Lake, Stellat'en First Nation.





## **FEELED Lab research community supports feminist environmental humanities**

The FEELED Lab is a feminist environmental humanities field research lab located on unceded Syilx territory in Kelowna, BC, with the goal of creating a hub for researchers, students and community members who share common interests in environment and sustainability issues, specifically from feminist, queer, anti-colonial and disability justice perspectives.

Sustainability issues are also social justice issues. The FEELED Lab supports critical, creative and collaborative research to explore these connections in the Okanagan watershed and beyond.

Early areas of focus for the FEELED Lab include building community, both online and in person. For example, Littoral Listening is a monthly online reading group that encourages collective discussion on environmental issues and seeks to build accessible communities of care. In 2022, the FEELED Lab also hosted the first annual Feminist Environmental Humanities summer symposium on the topic of “Listening, Attuning.” This was an intimate, accessible eight-day online intensive for emerging researchers from nine different countries.

In person research events included the monthly Fringe Natures events, which are small-scale, COVID-safe outdoor gatherings. Cultivating a DIY “make-do” vibe, these events use informal conversation, “low stakes” activities and embodied practice (walking, listening, improv, weeding, writing haikus, games) to deepen collective understanding about the intersection of environment and social justice questions. In 2022 the FEELED Lab also convened a Traditional Knowledge/ Land Use Circle featuring a Syilx traditional plant use workshop guided by elders Pamela and Grouse Barnes. Another key event was the Fire and Water symposium – a full day public gathering showcasing Syilx and settler-migrant writers and artists who use arts-based practices and storytelling to explore urgent ecological issues from feminist, anticolonial and antiracist perspectives.

Many FEELED Lab events such as these take place at the Woodhaven Eco Culture Centre. For FEELED Lab researchers, understanding their responsibilities to this specific place –part of a compromised watershed at the edge of encroaching urban development on unceded Syilx territory—is an integral part of the research. The FEELED Lab is working in conversation with the traditional owners and present-day users of Woodhaven to learn how to care for it. This also involves research on place-based accessibility and inclusion.

As FEELED Lab’s Director and Canada Research Chair, Dr. Astrida Neimanis is hopeful that small-scaled actions can lead to big change, when guided by feminist practice-led methods.

“The relationship between some humans-in-general and the planet-at-large is too big for most of us to get our heads around. But we can tend to relationships in this community, and learn how to care for this place, guided by Syilx knowledge. And this work must be joyful and affirmative, too.”





### Interdisciplinary Biodiversity Solutions research cluster

Interdisciplinary Biodiversity Solutions (IBioS) is an inter-departmental collaborative research cluster motivated by crises of biodiversity loss and degradation. The cluster emphasizes research, training, policy, and communication.

Expansion this year included a rigorous collaborative hiring process involving 8 departments in 4 faculties to appoint five new faculty. The new hires are joint-appointed in Botany, Zoology and the Institute for Resources, Environment and Sustainability (IRES) within the Faculty of Science.

Current projects include 'Anthropogenic Wilderness' – a proposed graduate course for understanding what constitutes "anthropogenic wilderness", and how Indigenous history and contributions are intertwined within it; a collaborative research proposal put forward by Land and Food Systems and IBioS on understanding human behaviours towards urban wildlife with a focus on bear conservation; and a podcast series 'Biodiversity Speaks' with faculty interviews on biodiversity conservation, restoration, and related issues.



### Optimizing solar energy systems at VEDA Student Residence

With one of the highest average temperatures in Canada at 14.3 °C, mild winters, and mean daily insolation of 3.61 kWh/m<sup>2</sup>, Kelowna is an ideal location for solar power. A new 152 kW photovoltaic system has recently been installed on the roofs of VEDA Student Housing near UBC's Okanagan campus, which is predicted to produce over 158 MWh of electricity during its first year of operation, of which 97% is used directly on site.

Dr. Alexander Uhl, assistant professor at the School of Engineering and team will use this living lab to investigate the performance of various solar technologies and installation parameters to improve the accuracy of predictive models in the region. "We're excited to provide a platform to validate the technical and economic viability of solar systems in the Okanagan, inspire and train students in green technologies, and provide clean and renewable energy for the region," said Uhl.

The project was coordinated by the Green Construction Research & Training Centre, funded by Mitacs Accelerate and industry partner VEDA Exclusive Student Living, and installed by SkyFire Energy.



### Waterways Past, Present and Future exhibit at Kelowna Museum

Waterways - the Past, Present and Future is a collection of interactive artworks that mobilizes knowledge accumulated over a four-year research project investigating and sharing stories and knowledge of the relationships between humans and water in the Okanagan Valley.

The artwork employs the creative and innovative use of interactive media and artistic software design to create a platform for dialogue across diverse community-based, poetic, traditional and scientific water knowledge. Two main sections include one focused on the Indigenous Syilx teachings, wisdom related to human-water relations and the value of water, and the other on sharing the stories of knowledge and importance of water and ecosystem management and stability.

"In keeping with Syilx environmental ethics, the Okanagan Waterways project reminds us that we all have a responsibility to work towards building and upholding the sustainability of water for healthy ecosystems and future generations." - Aleksandra Dulic, Associate Professor, Creative Studies, UBC Okanagan.

## Providing DTES community with access to sustainability research

The Downtown Eastside (DTES) supports a disproportionate amount of sustainability-related research for its size and capacity, and the results of that research can be difficult for community members to access.

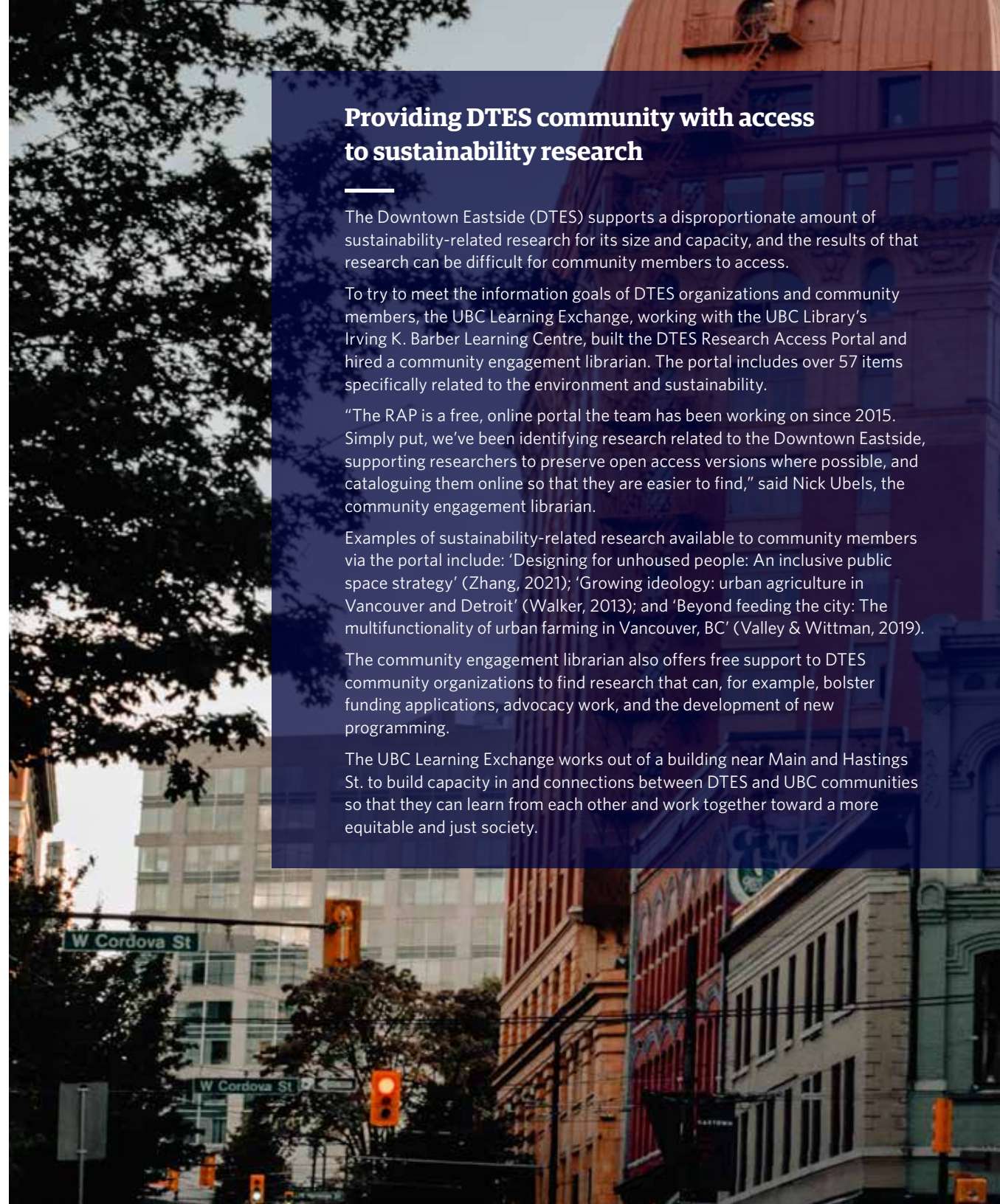
To try to meet the information goals of DTES organizations and community members, the UBC Learning Exchange, working with the UBC Library's Irving K. Barber Learning Centre, built the DTES Research Access Portal and hired a community engagement librarian. The portal includes over 57 items specifically related to the environment and sustainability.

"The RAP is a free, online portal the team has been working on since 2015. Simply put, we've been identifying research related to the Downtown Eastside, supporting researchers to preserve open access versions where possible, and cataloguing them online so that they are easier to find," said Nick Ubels, the community engagement librarian.

Examples of sustainability-related research available to community members via the portal include: 'Designing for unhoused people: An inclusive public space strategy' (Zhang, 2021); 'Growing ideology: urban agriculture in Vancouver and Detroit' (Walker, 2013); and 'Beyond feeding the city: The multifunctionality of urban farming in Vancouver, BC' (Valley & Wittman, 2019).

The community engagement librarian also offers free support to DTES community organizations to find research that can, for example, bolster funding applications, advocacy work, and the development of new programming.

The UBC Learning Exchange works out of a building near Main and Hastings St. to build capacity in and connections between DTES and UBC communities so that they can learn from each other and work together toward a more equitable and just society.





# Operations and Infrastructure

As a large, research-intensive university, with considerable land, assets and utilities in Vancouver and the Okanagan, UBC is in a unique position to use our campuses as test beds for sustainability. Our goals are to enhance the efficiency of our operations, improve environmental performance, and achieve cost savings, while leveraging our campus infrastructure and built environment to demonstrate innovative sustainability solutions at a municipal scale.

**NEW!**  
New Zero Waste and Circular Economy Plan coming soon at UBC Vancouver

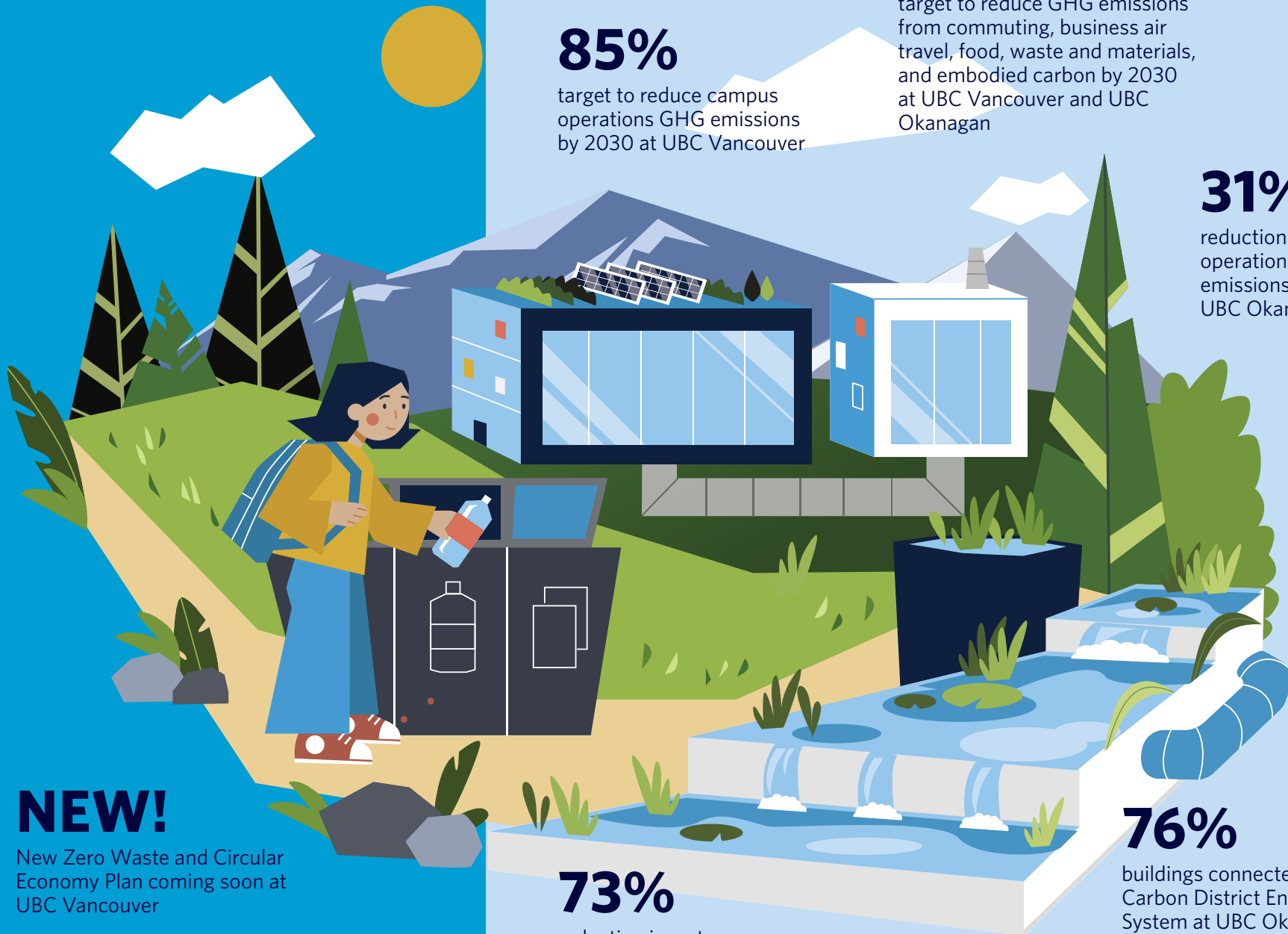
**85%**  
target to reduce campus operations GHG emissions by 2030 at UBC Vancouver

**45%**  
target to reduce GHG emissions from commuting, business air travel, food, waste and materials, and embodied carbon by 2030 at UBC Vancouver and UBC Okanagan

**31%**  
reduction in campus operations GHG emissions vs 2013 at UBC Okanagan

**73%**  
reduction in water use intensity per student since 2000 at UBC Vancouver

**76%**  
buildings connected to Low Carbon District Energy System at UBC Okanagan





# Energy and Emissions

UBC’s Vancouver campus now produces 25% fewer GHG emissions than it did in 2007, while our institutional floorspace increased by 25% during the same period. At UBC’s Okanagan campus, a focus on sustainable buildings and low carbon energy supply has achieved a 31 percent reduction in absolute GHG emissions vs. 2013, simultaneous with a 22% rise in floorspace.

## UBC VANCOUVER

**Climate Action Plan 2030 (CAP 2030) – new and ambitious plan endorsed »** CAP 2030 responds with urgency to the climate crisis by providing a decarbonization pathway to net zero operational emissions by 2035, and was endorsed by the UBC Board of Governors in 2021.

CAP 2030 establishes accelerated goals to achieve an 85 per cent reduction of operational emissions and a 45 per cent reduction of extended emissions – associated with commuting, air travel, food and waste – by 2030, in order to align with or surpass the Paris Agreement’s target to limit global warming to 1.5°C.

**Low Carbon District Energy System boosted »** Many of UBC’s buildings are heated using a district energy system. Significant reductions in operational GHG emissions have already been achieved by this system, especially by using local wood waste to provide a renewable source of energy.

In November 2021 the Bioenergy Research & Demonstration Facility gasifier was re-ignited as part of a 12-Megawatt expansion project, which once completed will help achieve operational GHG reductions (Scope 1 & 2) of approximately 60% from the 2007 baseline year. A study is currently underway to develop future low carbon pathways for the district energy system to achieve the bold 85% reduction target in CAP 2030.

**Holistic building decarbonization »** CAP 2030 contains specific targets for decarbonizing UBC’s building energy and the embodied carbon from building materials, which represents a significant contribution to overall carbon emissions. The UBC Gateway building

project – awarded the 2021 Canadian Architect Award of Excellence – is being designed to target Zero Carbon Building Certification. It will co-locate the schools of nursing, kinesiology, language science and UBC health clinics, and the project team is working closely with the Musqueam community to meaningfully incorporate cultural values into the project.

**New heat recovery projects »** To achieve the energy conservation and climate targets set out by UBC, Energy and Water Services (EWS) reinvests half a million dollars of annual energy savings into new energy conservation capital projects. This year included installing a heat recovery chiller in the Chemistry Centre, and adding condenser heat recovery coils to Chemistry North. In addition to those capital projects, EWS also installed a demand control ventilation system in the Pharmaceutical Sciences building, and completed a suite of energy conservation automation measures in I.K. Barber Library.

## UBC OKANAGAN

**First ever UBC Okanagan Climate Action Plan endorsed »** UBC Okanagan’s first climate action plan also aligns with the Paris Agreement’s target to limit global warming to 1.5°C. It does so by establishing an ambitious goal to achieve a 65 per cent reduction of operational emissions (vs. a low baseline) and a 45 per cent reduction of extended emissions – associated with commuting, air travel, food and waste – by 2030. The Plan further supports the longer-term goal of achieving a net positive performance in operational energy and carbon by 2050, as established in the UBCO Whole Systems Infrastructure Plan.

**Low Carbon Energy Strategy and Strategic Energy Management Plan reduce consumption »** Key plans that support energy and emissions reduction goals include the Strategic Energy Management Plan (SEMP), which provides a suite of demand-side management projects to reduce energy consumption and associated emissions, and the Low Carbon Energy Strategy, which guides future low carbon district energy system development and investments. SEMP projects implemented in 2021 are estimated to have reduced energy and emissions by 655,000 kWh, 2,800 GJ and 146 tCO<sub>2</sub>e per year.

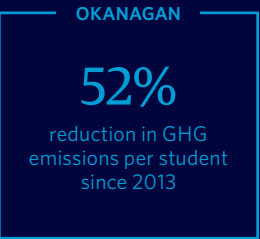
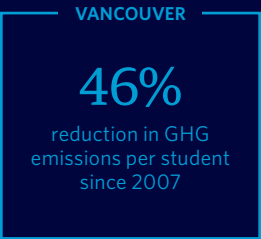
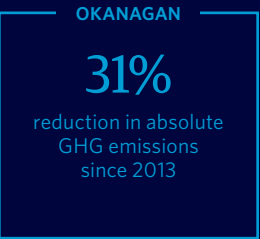
## FEATURE STORY

### Thermal energy recovery from computing cluster heats building

A server room in the basement of Chemistry D (Centre) Block currently holds a computer cluster in support of research and learning. In order to properly regulate the heat produced from the complex chemistry simulations performed on these servers, the room requires cooling at all times of the year.

The team at Energy & Waters Services identified an opportunity to recover the transferred heat from the server room—the output from the cooling—by installing a heat recovery chiller. The installed equipment is designed to convert the heat being rejected by the servers to usable thermal energy for space heating in other areas of the building.

After many years of project development, the heat recovery chiller was put into operation in the Chemistry D Block building in late 2021. Now heat recovered from these servers provides almost all of the space heating needs for the building year-round, and the project is expected to produce almost 5,000 GJ of annual thermal energy savings – reducing energy costs by almost \$50,000 per year.







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## FEATURE STORY

### **Energy savings realized despite increased ventilation due to COVID-19**

Through the myriad ways that COVID-19 has affected our community, one potentially unforeseen consequence was the effect on energy use at UBC.

The health of building occupants was a key priority when general occupancy returned at the beginning of the 2021/22 academic year. However, increasing the proportion of outside air being provided into campus spaces, as well as increasing ventilation rates and running air systems for longer hours greatly increases energy demands from our ventilation systems. Despite these increases, UBC's Energy and Water Services department was still able to meet their energy reduction target of three gigawatt hours.

Thermal demand reductions were much less than expected, however, as increased ventilation rates eroded a significant portion of winter thermal savings. Existing and new demand reduction measures, such as reducing nighttime setbacks, ramping temperature setpoints, and longer preheat periods, have proven highly effective at maintaining energy savings and many will be permanent fixtures in UBC's building control systems.



# Water

Climate change impacts related to water resources at UBC include increasing drought periods, heavy rainfall events, and potential disruptions to water supply due to emergencies. Multiple departments are collaborating to address these issues through interdisciplinary research, innovative and efficient buildings and infrastructure design, and developing a roadmap for climate adaptation and resilience.

## UBC VANCOUVER

**New Water Pump Station increases campus resilience »** The installation of a new Water Pump Station meets 70% of the campus demand for domestic cold water, with each pump capable of delivering 200 litres per second of water. It increases the resilience of the campus by ensuring high-pressure water is available for firefighting, and by increasing seismic resilience of the water supply system.

Unlike many older infrastructure systems, the station design also acts as a visually appealing and educational installation. Window glazing at ground level showcases the water supply systems, and wrap-around graphics help educate passersby about UBC’s water supply infrastructure.

**Focusing on water conservation and efficient usage »** Supported by UBC’s Water Action Plan and Green Building Action Plan, the Green Labs program is working with researchers to identify new water conservation opportunities in labs. In addition, new building designs continue to strive for more and more water-efficient design, using LEED and UBC REAP green building rating systems.

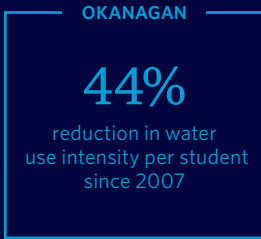
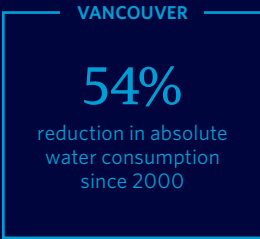
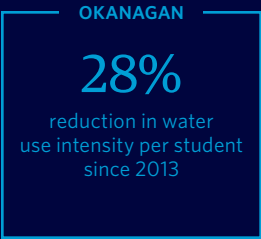
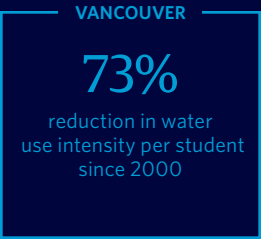
**SEEDS research develops emergency water supply strategies »** Groups of Civil Engineering students participating in a SEEDS research project to tackle the challenge of designing emergency water supply infrastructure for the campus. The students collaborated with one of UBC’s senior civil engineering managers to develop different strategies and designs to provide alternative water supply using available groundwater resources in the event of an interruption to UBC’s water supply.

## UBC OKANAGAN

**Achieving 100% rainwater diversion »** Staff successfully achieved a goal of diverting 100% of the rainwater from municipal systems through ongoing adherence to the campus’ Integrated Rainwater Management Plan. This year completion of the Nechako Residence and Commons Block building incorporated a raingarden to retain water, as part of an overall system designed to manage rainwater within the campus boundaries.

**Landscape and irrigation projects support water conservation and biodiversity »** UBC Okanagan continued to implement landscape and irrigation projects that support water conservation and the ecological biodiversity of the campus. These included:

- Leaf-mulching program in which autumn leaves are collected and shredded, then re-applied to our landscape beds as a mulch to help hold moisture in the soil and suppress weeds
- Replacing sprinklers in garden beds with drip irrigation lines to reduce water use
- Managing invasive species including the Siberian Elm (managed) and Myrtle Spurge (toxic, removed)
- Planting hardy and pest-resistant species of trees
- Installing a new low-maintenance, drought-tolerant and pollinator-friendly landscape at the Upper Campus Health building





## Waste and Materials

UBC Vancouver’s Climate Action Plan 2030 defined new targets – including a 50% reduction in waste disposal by 2030 vs. 2019. In the Okanagan, a closely aligned goal aims for a 50% reduction in waste (per capita) by 2030, while progressing toward a zero-waste community. Achieving these targets will require continued updating of infrastructure and operational processes, the commitment of the campus community, and collaboration with sustainable industry partners and government policymakers.

### UBC VANCOUVER

**Developing a new Zero Waste and Circular Economy Plan »** This year work began on a new action plan that applies a circular economy lens to both reduce waste and life cycle GHG emissions associated with waste and materials in alignment with the Paris 1.5°C climate agreement target. Engaging a wide range of stakeholders across campus and linking with external policies and initiatives, the new plan is expected to be complete in late 2022.

**SEEDS circular economy research informs community consultations »** A series of SEEDS student research projects informed the planning of UBC’s emerging Zero Waste and Circular Economy Plan, and related targets in UBC’s Climate Action Plan 2030. Student-led research developed a review of circular economy and waste reduction concepts that provided the framework for public consultations, and developed recommendations for preliminary key performance indicators and gathering baseline data.

**Partnering with RETURN-IT to increase container recycling »** UBC and provincial non-profit Return-It partnered to launch an Express & GO station on campus – a first for the west side of Vancouver – allowing for the quick and easy recycling of empty beverage containers. Supporting UBC’s zero waste targets and BC’s beverage container product stewardship program, the station provides a convenient way for residents at UBC and surrounding communities to return beverage containers for a refund, and ensures that these containers are recycled.

**Expanding the reuse of goods and equipment with REUSE-IT! »** Revamping Reuse-it! – UBC’s online platform for exchanging and reusing goods and equipment on campus – included providing users with a more powerful interface, along with launch of a promotional campaign to encourage greater usage.

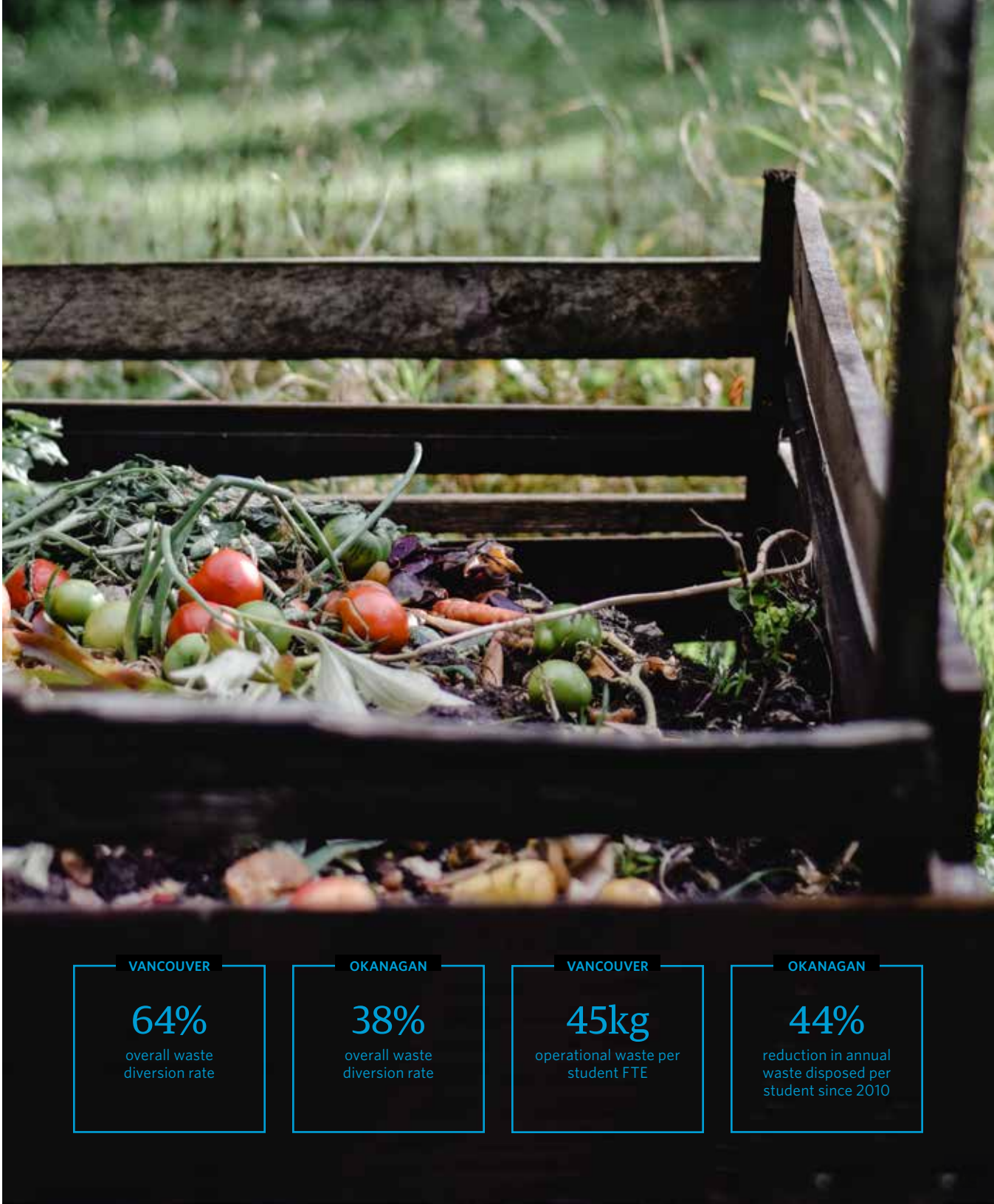
Since relaunching, monthly usage of the platform increased nearly fourfold. Over the coming year, UBC is pursuing further expansion, to increase reuse of furniture, IT equipment, and laboratory equipment, with the potential to reduce waste and materials life cycle emissions by hundreds of tonnes per year.

### UBC OKANAGAN

**Enhanced compost program avoids GHG emissions and improves waste diversion rate »** UBC Okanagan’s compost program successfully diverted 44 tonnes of fibrous and organic material from landfill waste this year, avoiding the release of 27 tCO<sub>2</sub>e emissions and supporting a 7% increase in waste diversion vs. 2010. Recent program enhancements include revised sorting station placement, campus-wide signage updates, and the expansion of accepted items in compost – including all organics, bones, carbohydrates and proteins, along with single-use, compostable take-out containers and utensils, and fibrous materials, including pizza boxes and paper hand towels.

**Pritchard Dining Hall Reduces Food And Material Waste »** Reducing food and single-use waste while promoting sustainable food options are a priority in UBCO’s newest 450-seat eatery. The Pritchard Dining Hall features an all-you-care-to-eat dining experience, and to minimize waste, the cafeteria provides no take-out containers - instead using reusable foodware - and provides patrons with full material sorting stations to ensure waste is diverted from the landfill.

**Remote working and learning reduces paper use and emissions by 40% »** The Okanagan campus achieved a second year of significant reductions in paper purchases and paper use, resulting in the campus purchasing 737 fewer packages of paper, equal to saving 368,500 sheets. Remote working and learning paired with the use of PaperCut™, a user-driven online based printing program, supported the achievement of a 40% reduction in paper-related greenhouse gas emissions.



VANCOUVER

64%

overall waste diversion rate

OKANAGAN

38%

overall waste diversion rate

VANCOUVER

45kg

operational waste per student FTE

OKANAGAN

44%

reduction in annual waste disposed per student since 2010



# Green Buildings

UBC buildings create an exceptional and sustainable environment for teaching, learning and research, and places to socialize, live and play. In Vancouver, our vision is that by 2035, our buildings will make net positive contributions to human and natural systems. In the Okanagan, our whole systems plan approach to energy efficiency, low carbon district energy, and climate adaptive design supports an equivalent goal to achieve a net positive performance in operational energy and carbon by 2050.

## UBC VANCOUVER

### Reducing the total carbon footprint of buildings »

An array of measures are reducing the carbon footprint of campus buildings, and both operational carbon and embodied carbon of buildings are now quantified for new buildings and retrofits. For example the Gateway project is currently being designed to meet the Zero Carbon Building Standard. Not only will the operational emissions be very low, but UBC will pay offsets on the small remainder. The wood hybrid structure and careful attention to building materials will ensure low embodied carbon.

### Integrated sustainable building design updated »

This year the approach to creating sustainable buildings has been improved at UBC with an updated process and guidelines that support integrated design. In addition to carbon reduction, integrated design supports creating a healthy and welcoming environment, and biodiversity on campus by encouraging a holistic approach early in design.

**New faculty and staff housing: Evolve »** Evolve is a new 6-storey faculty and staff rental building featuring 110 homes in Westbrook Village. This project is targeting both REAP gold plus and Passive House certification, as well as aiming to be UBC’s first net zero energy building. Research conducted on the building when occupied will be disseminated among the property development community to share knowledge and learnings.

**SEEDS student research supports green roofs, biodiversity, and bird species »** Applied student research analyzed potential locations on campus for green roof installations. Using LiDAR data to create

suitability criteria for campus buildings, students assessed the potential impact of green roofs on ecosystem services such as stormwater runoff and on ecological connectivity.

Other research identified 10 native species of birds associated with conservation issues. The research combined survey data from UBC community members and ecological data to determine species where feasible improvements could be made. Research resulted in key recommendations for developing and improving bird habitat on campus. The research is of considerable value for informing future landscape design projects, and providing data to create more biodiverse and bird friendly landscapes.

## UBC OKANAGAN

**Skeena Residence achieves first passive house dormitory in Canada »** Achieving Passive House Classic Certification and winning BC’s Net-Zero Energy-Ready Challenge – UBC Okanagan’s Skeena Residence is the first Passive House Certified Dormitory in Canada. The project exceeded Passive House standards for airtightness and implemented a variety of measures to reduce heating demand. Skeena Residence was also a recipient of the 2021 Canadian Green Building Awards, which recognizes some of the best examples of sustainable, high-performance building designs in Canada.

**Two new capital projects focus on reducing carbon footprint while serving the region »** UBC Okanagan will focus on the development of two new major capital projects currently in design.

The Interdisciplinary Collaboration and Innovation (ICI) building will target a minimum LEED® Gold Certification, while aiming to reduce the carbon footprint of the building and its operations. Design strategies include an earth tube for passive air ventilation to reduce energy consumption, operating costs and GHG emissions.

With the aim to serve future regional needs, a new project - UBCO Downtown - will expand UBC’s footprint in Kelowna while working to meet LEED® Gold Certification and Step 3 of the BC Energy Step Code. The design approach is rooted in passive principles to minimize both impact and the energy required to heat and cool the building.

## FEATURE STORY

### Arts Students Centre

The new three-storey, cylindrical building opened in November 2021 and is a meeting place for Arts students to interact, collaborate on projects, and host events.

Sustainability is at the forefront of the building’s form, with metal fins on the exterior to prevent bird strikes and minimize heat solar gain, automated ventilation systems for the building to naturally cool itself, and an open concept with large windows for light, ventilation, and all-around visibility. The cylindrical form with a generous atrium between the second and third floors also honours the building’s mission, allowing activity to continuously and serendipitously overlap, and encouraging interaction between Arts students across programs and activities.

The \$10-million space was primarily funded by Arts students through an annual fee, with the Faculty of Arts donating \$3-million and the university contributing \$1.5-million.

“The opening is a reminder of how effective student organizing can be on campus. It took almost 10 years of student planning and collaboration with the Faculty to get the project from a fun idea to being built. Let it show young, driven students that hard work and focus on big things can pay off.” - Ben Foster, former Arts Undergraduate Society VP Administration.



### VANCOUVER

27

LEED certified buildings

### VANCOUVER

21%

LEED certified building area of the total area on campus

### OKANAGAN

71%

of buildings connected to Low Carbon District Energy System

### OKANAGAN

36%

less energy used in buildings per FTE since 2013



# Community

UBC is home to a growing community of people that live, work, learn and take part in everything that UBC has to offer. Each year, we design and deliver quality programming and events that leverage our world-class assets and public spaces. Our goal is to foster an inclusive and welcoming campus by sparking the imagination of our community members to join us.

**20%**

target of all housing to be restricted rental for faculty and staff at below-market rates at UBC Vancouver

**66%**

planned increase in childcare spaces at UBC Okanagan

**92%**

in TransLink survey support the SkyTrain extension to UBC Vancouver

**12,711**

beds in student residences on-campus at UBC Vancouver

**64%**

of all trips to and from campus made by sustainable modes of transport at UBC Okanagan

**841**

faculty and staff rental units on-campus at UBC Vancouver





# Campus Vision 2050: Planning the future of the Vancouver campus

UBC is preparing for the future by engaging the university community and xʷməθkʷəy̓əm (Musqueam) in a comprehensive land use planning and engagement process that will shape how the Vancouver campus changes and grows over the next 30 years.

Campus Vision 2050 will result in a long-term plan for the campus that supports the needs of the university and balances the multiple interests of xʷməθkʷəy̓əm and the UBC community.

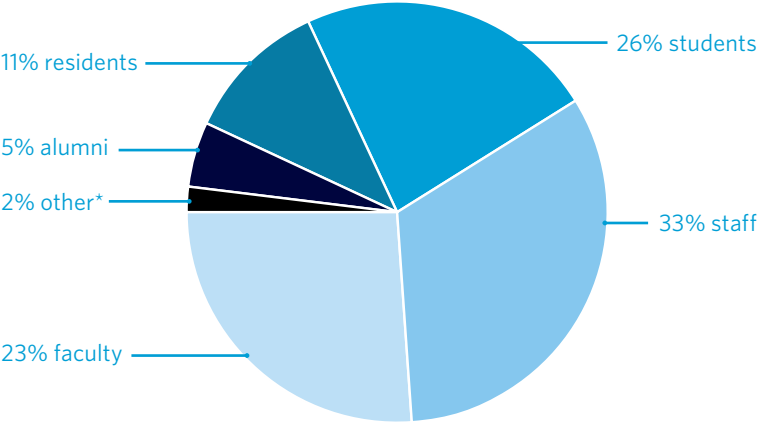


## UNDERSTANDING NEEDS AND ASPIRATIONS

Campus Vision 2050 launched in early 2022 with two rounds of community engagement between January and April. During this time, Campus + Community Planning sought to better understand the campus community's 'Needs and Aspirations' for the future, and identify challenges and opportunities for Campus Vision 2050 to address.

Over 3,300 people participated and a breakdown of participation by primary affiliation can be seen below.

Participation by affiliation to UBC



\*Includes participants such as emeritus professors, external stakeholders, and non-affiliated members from the Vancouver Region.

## OUR APPROACH TO COMMUNITY ENGAGEMENT

Campus Vision 2050 engagement builds on Campus + Community Planning's Engagement Charter, and emphasizes principles of equity, diversity and inclusion, building trust, providing diverse ways to meaningfully engage, and ensuring clear communication and transparency.

Campus + Community Planning listened to a wide range of communities, units, departments, clubs and organizations through broad public engagement. In addition, there were 80 meetings with a variety of groups across campus, including 13 groups representing equity deserving communities. UBC and xʷməθkʷəy̓əm are working together to co-develop a comprehensive framework for engaging xʷməθkʷəy̓əm on land use initiatives, including Campus Vision 2050, seeking to integrate xʷməθkʷəy̓əm values, interests and comments into planning.



WHAT WE HEARD

Throughout the engagement process, we heard a call for the draft vision to be bolder and more aspirational.

**Supporting excellence in teaching, research and learning** — we heard participants emphasize that people are at the heart of academic mission, and that meeting the breadth of community needs is essential to the success of this principle.

**xwməθkwəyəm and the Indigenous Strategic Plan (ISP)** — we heard a strong call to co-develop the principles and strategies with xwməθkwəyəm and to provide transparency on how xwməθkwəyəm and campus Indigenous communities have been involved throughout the planning process.

**Supporting affordability and everyday needs** — we heard that affordable housing is a top community concern, as well as the need for more affordable and diverse food options on campus.

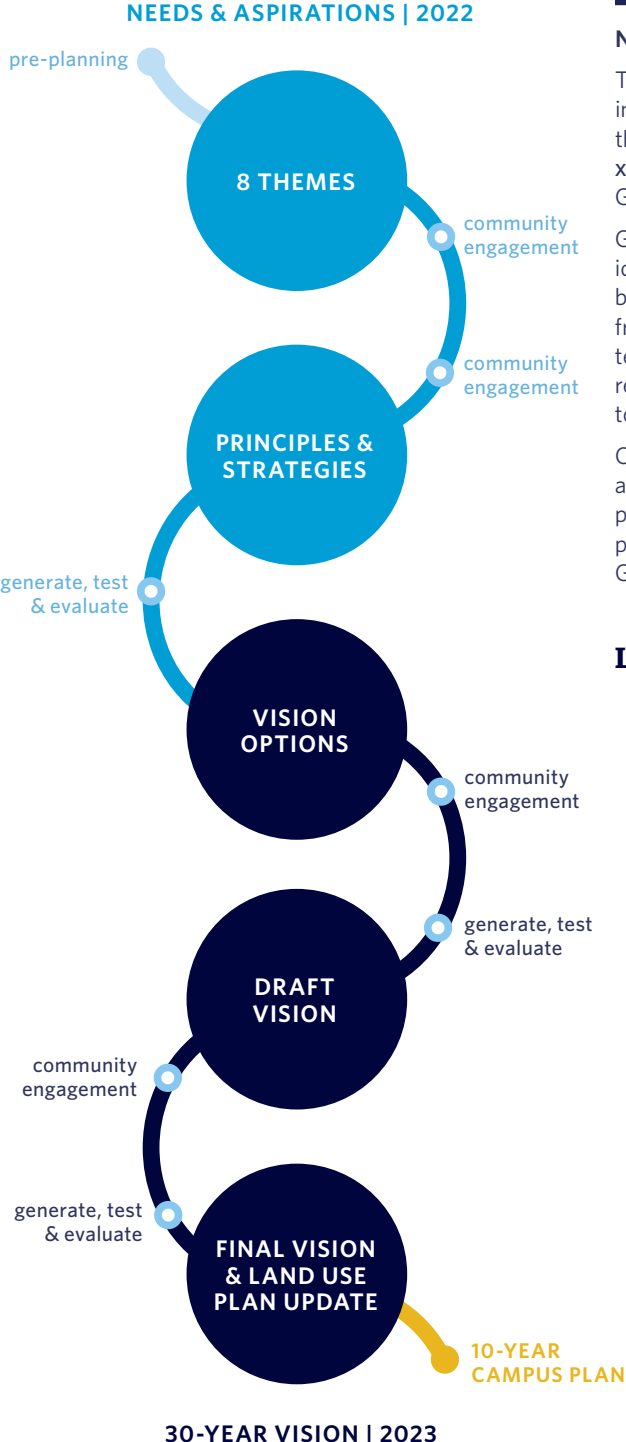
**Inclusion, belonging and community building** — we heard support for more gathering spaces and

improvements to safety on campus, and received suggestions to use more specific, inclusive and plain language in the strategies.

**Campus ecology, livability and funding UBC’s priorities** — we heard strong feedback that funding and housing development does not fit within considerations of ecological stewardship, and that green spaces and forested areas should be preserved on campus.

**Responding to the climate emergency** — we heard a call for stronger language and targets to demonstrate institutional commitment to this principle, as well as support for climate adaptable and resilient buildings. We also heard a call for biodiversity loss to be considered under this principle.

**Strengthen campus and regional connectivity** — we heard support for the arrival of SkyTrain to UBC and concern around potential impacts that result from new transportation infrastructure investment. We also heard support for more cycling infrastructure on campus, and a call for ecological connectivity and biodiversity to be considered under this principle.



NEXT STEPS

The final Terms of Reference, which was shaped by input from the UBC community, advisory committees, the University Neighbourhoods Association Board and xwməθkwəyəm, was approved by the UBC Board of Governors in June 2022.

Guided by the approved Terms of Reference, a range of ideas and options that will shape the 30-Year Vision will be shared for discussion and input. Based on feedback from the UBC community and the university, and further testing and evaluation, a draft 30-Year Vision and recommended Land Use Plan updates will be presented to the community in early 2023 for feedback.

Once the 30-Year Vision and Land Use Plan is approved, a 10-Year Campus Plan and similar neighbourhood plans will be developed through a similar engagement process, before submission to the UBC Board of Governors in 2024.

**Learn more:** [campusvision2050.ubc.ca](https://campusvision2050.ubc.ca)



## Community Programs

UBC’s campuses and neighbourhoods are vibrant, sustainable, connected communities of students, faculty, staff, and residents – it is community members who help make UBC such an incredible place to live, work, and learn. Each year, we work with campus partners to design and deliver programs, events, and initiatives that leverage UBC’s world class cultural and recreational amenities and public spaces with the goal of sparking imagination, providing opportunities for community capacity-building, and fostering an inclusive and welcoming campus for all.

As community members returned to in-person learning and working, we continued to provide creative opportunities for connection, vibrancy, and inclusion – both in-person, and online.

**Thrive by the Fire pop-up concerts »** In support of UBC’s annual ‘Thrive’ campaign promoting mental health literacy, Thrive by the Fire brought community members together for an outdoor concert, featuring student performers from the Blank Vinyl Project. Guests gathered around cozy fire pits to listen to relaxing tunes and talk about how to thrive, even in the most challenging of times.

**Lights in Lee Square support ‘Move UBC’ »** To animate and activate the campus at night, a number of exciting lighting installations were projected onto Raymond and Money Lee Square throughout the year. UNA and UBC community members were invited to share what helps them “Thrive Together” with an illustration or animation in support of Thrive month, while an interactive dancing animation encouraged the community to have fun and “move more” during Move UBC month.

**Kids Take Over UBC »** After last year’s online adventures, we were pleased to bring back Kids Take Over UBC in hybrid form. This annual event let kids take the lead in exploring many of UBC’s cultural amenities and venues. Campus partners, including the Museum of Anthropology, Beaty Biodiversity Museum, Nitobe Gardens, First Nations House of Learning, and more provided safe, fun, family-friendly programming, while a number of online activities were hosted through a digital treehouse.

**Movie on the Mall »** To celebrate the start of the academic year, Campus + Community Planning partnered with AMS First Week to host an outdoor movie on Main Mall for all UBC community members.

**UBC Botanical Garden hosts Biodiversity Days and SEEDS research »** UBC Botanical Garden hosted a month-long celebration for Biodiversity Days featuring family nature walks, and provided the venue for the SEEDS Research to Action Showcase including research on campus bird conservation, biodiverse food procurement, climate adaptation prediction for maple species, and a public engagement strategy for biodiversity topics.

**Return to in-person community programs »** The return of many beloved in-person programs for families living on campus included the UTown@UBC Nature Club, Inspiring Community Grants, and Youth Leadership Group — comprised of teens from the UNA and Acadia Park.

VANCOUVER

22

Inspiring Community grants awarded to UBC and UNA community members

VANCOUVER

1,600+

people registered for Kids Take Over UBC online and in-person activities

VANCOUVER

14

departments at UBC partnered to provide Kids Take Over UBC programming

VANCOUVER

314

bikes registered through Project 529 to prevent bike theft



### FEATURE STORY

#### Inspiring Community Grants

As provincial health orders shifted, the UBC community continued to share and celebrate their time and talents, explore opportunities for social connection, and support one another.

A total of 22 Inspiring Community Grants were awarded to a number of outstanding and inspiring capacity-building projects, including:

- **Sharing Indigenous teachings through song and dance:** Residents of Acadia Park learned about the teachings, story, and bear dance at this event, featuring Laura Grizzlypaws, Indigenous Woman, Mother, bear dancer, and fluent Státimcets language speaker.
- **xʷməθkʷəy̓əm (Musqueam) gets ready for winter:** Hosted by the Musqueam housing department, a community event called, “Game of Homes”, featured games, presentations, and activities for families living on-reserve to learn about how to save energy during winter, improve indoor air quality, and enhance the health and safety of their homes.
- **Propagating Plants, Growing Community.** Led by a graduate architecture student, this project inspired connections between neighbours, by facilitating knowledge exchange on the propagation and exchange of plants.
- **Just for Kids Community Grants.** A special stream of community grants providing UBC’s youngest residents with up to \$300 to implement their ideas for creating social connections between residents in their community, or sharing skills or talents with each other. Projects included a youth running club, an arts and craft workshop, and more.



# Transportation

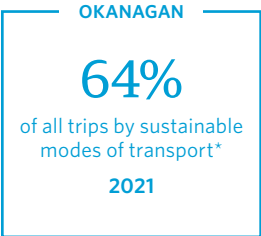
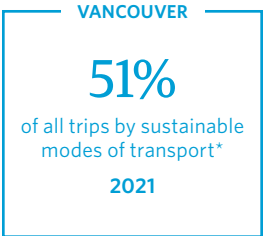
UBC’s campuses in Vancouver and the Okanagan are a destination for students, staff, faculty, alumni and visitors from across the region, as well as home to many residents. This year on campus activities resumed, but many staff and some students and faculty continued to work and learn remotely thanks to COVID-19 policies — allowing UBC to maintain services while further reducing commuting emissions.

## UBC VANCOUVER

**SkyTrain to UBC advancing with strong public support »** This year TransLink surveyed over 15,000 people across Metro Vancouver and found that 92% of respondents support the extension of SkyTrain Millennium Line to UBC. People who live further from UBC, beyond the City of Vancouver, were even more likely to say they support the extension (93% support).

Endorsed by the Mayors’ Council on Regional Transportation, and confirmed as a regional priority in TransLink’s Transport 2050 Plan, the SkyTrain connection to UBC could open as early as 2030, reducing transit commute times by as much as 20-25 minutes each way.

**Campus bike share enjoys 30,000 trips »** UBC’s campus-wide bike share program continued to operate this year with 30,000 trips taken, covering over 37,000km. Throughout the COVID-19 pandemic, the program served an important role in providing a socially-distanced and sustainable mode of transportation for neighbourhood residents, students, workers and visitors to get around UBC Vancouver’s 400-hectare campus.



\*Sustainable modes of transport include walking, biking and transit.

## UBC OKANAGAN

**New transportation plan to reduce emissions »** Completed in 2021, the UBCO Transportation Plan provides direction for a shift towards more sustainable modes of travel. To support ongoing campus growth and reduce commuting emissions, the Plan establishes a roadmap for meeting the transportation needs of the campus through 2040, describes the University’s Vision for the future of transportation, and articulates related objectives, targets, strategies and actions.

Implementation of this plan is required to achieve the UBCO CAP 2030 commuting-related GHG reduction target.

**Discount transit pass for staff and faculty »** This year UBCO partnered with the City of Kelowna and BC Transit to offer a discounted transit pass to staff and faculty through the ProPASS program, a key recommendation of the new UBCO Transportation Plan. This year all staff and faculty were eligible to receive a 15% discount on monthly transit passes and next year UBCO is planning to increase the discount further.

**Electric bike pilot launch »** Getting to, from, and around UBC’s Okanagan campus was made easier and more sustainable through the implementation of an e-bike pilot program in early 2022. UBC Okanagan joined the City of Kelowna’s shared micro mobility pilot, enabling SPIN Mobility to operate their shared e-bike program on campus through August 2022.



## FEATURE STORY

### Remote work support increasing; productivity maintained

Although UBC policy has long accommodated remote work for eligible staff and faculty, workplace culture and logistical barriers meant there was very little take-up. However, during the COVID-19 pandemic technological barriers were overcome and staff and faculty demonstrated that productivity can be maintained, and even improved in some cases, when working from home.

Workplace experience surveys confirm that staff and faculty across many units at UBC are interested in continuing to work from home at least a few days a week post-pandemic. In the fall of 2021, with the return of campus activities, many departments offered support for working from home a few days a week.



# Housing and Amenities

UBC is building a vibrant community by providing campus housing options to students, faculty, staff and residents, and by developing recreation facilities, community centres, parks, and open spaces and other community amenities within our neighbourhoods and academic spaces. Driven by UBC’s vision to be a world-class community of scholars with access to a beautiful, and sustainable campus, we are committed to increasing housing choices and growing amenities.

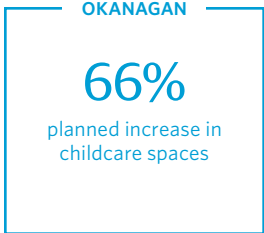
## UBC VANCOUVER

The UBC Vancouver campus now provides 841 faculty and staff rental units, and has expanded student residences to 12,711 beds.

**225 new rental units in Wesbrook village »** UBC’s Housing Action Plan (currently being reviewed and updated alongside Campus Vision 2050), is part of the university’s overall strategy for academic excellence and sustainability leadership, integrating the responsible management of our campus land with these goals.

Key targets and performance metrics related to improving rental choice and affordability for faculty and staff include:

- Creating 30% of future housing on campus for rental – with at least 20% restricted rental for faculty and staff at below-market rates
- Rental units currently make up 31% of all neighbourhood housing, with 262 more faculty and staff rental units under construction this year
- Faculty and Staff rental units now make up 41% of all rental units



**Child care demand fluctuates in response »** This year child care centres in the UBC community and neighbourhood housing areas provided 978 spaces, including spaces for ages 0-5 and out of school care. Due to low demand, 20 pre school spaces and 16 occasional drop in spaces were closed. These closures were partially offset by an increase in 14 out-of-school care spaces.

The Child Care Expansion Plan aims to create an inventory of approximately 1,200 spaces by 2041, with a focus on delivering more child care spaces for children under 3 years of age.

## UBC OKANAGAN

**Nechako Residences raises beds to over 2,100, adds dining, 24-hour amenities »** The 2020 completion of the Skeena Residence, and 2021 completion of the Nechako Residence and Commons Block have increased student housing by 440 beds to just over 2,100 beds, a 26% growth from 2019. Nechako also offers residents 24-hour amenities, and provides a 450-seat dining hall for campus residents.

Future renovations to UBC Okanagan’s existing childcare facility are anticipated to add 37 new spaces upon completion.

## FEATURE STORY

### UBC Okanagan Downtown

Plans for the evolution of UBC’s expansion in Kelowna were revealed in winter of 2021. The project includes a residential component identified for university rental housing, as well as academic, research, shared-use, office and amenity space. UBC Okanagan is intent on developing a design that adheres to the same strict low-carbon and sustainable standards that are already in place on campus. The downtown project will be very close to the Okanagan Rail Trail and public transit arteries, so moving by bike between UBC Okanagan and the downtown site will not only be possible but also safe, fun and sustainable.

Having a location downtown means that those engaged in community-based academic work have better access to community partners, resources and expertise. For example, students in the Faculty of Health and Social Development will benefit from proximity to partners like Interior Health, the Kelowna General Hospital, and social-service providers like the Kelowna Gospel Mission. Researchers will benefit from strengthening community-based organizations that allow them to pursue their research programs and connect more easily with the public. Through these plans, UBC will bring community-focused academic activities into the heart of Kelowna.





## FEATURE STORY

### **tə šxʷhəleləm̓s tə kʷaλkʷəʔaʔt**

tə šxʷhəleləm̓s tə kʷaλkʷəʔaʔt (The Houses of the Ones Belonging to the Saltwater) is the newest residence community at UBC Vancouver. The xʷməθkʷəy̍əm (Musqueam) Nation generously gifted the hə́h̓qəmiḥə́h̓ language residence and house names to UBC in spring 2021. The marine animals, after which the houses at tə šxʷhəleləm̓s tə kʷaλkʷəʔaʔt are named, all reside in saltwater. Collectively, they convey themes of sustainability and biodiversity, along with individuality and cooperation.

Providing housing for nearly 750 students in a revitalized area of campus alongside Walter Gage, Brock Commons and Exchange residences, tə šxʷhəleləm̓s tə kʷaλkʷəʔaʔt is just steps away from the UBC bus exchange, Aquatic Centre, and Student Recreation Centre. The AMS Nest, UBC Life Building and many other campus amenities are also nearby.

In September 2021, q̓ə́l̓tə́ləm̓əcən̓ lələ́m̓ (Orca House) and qʷta:yθən̓ lələ́m̓ (Sturgeon House) opened, followed by stəwə́t̓ lələ́m̓ (Herring House) in January 2022 and təməs̓ lələ́m̓ (Sea Otter House) and sqimə́kʷ lələ́m̓ (Octopus House) in April 2022, completing 940 new student beds.



# Wellbeing

UBC Wellbeing is a collaborative effort to make the university a healthier and more inclusive place to live, work, learn, and play. As UBC communities continued to navigate the global pandemic and shifts between remote and in-person classrooms and offices, this year reinforced our belief that good health and wellbeing for people, places, and the planet are the foundation of our success as individuals, a university, and a community.

## UBC VANCOUVER

**Developing the Wellbeing Strategic Framework Roadmap »** To meet the 2025 targets outlined in the Wellbeing Strategic Framework, the development of a four-year Roadmap with key milestones is underway with Wellbeing Priority Area Committees and key stakeholders. The Roadmap has begun to identify lead and contributing units, timelines, and status updates, indicating if milestones are on track, need attention, or are on hold. Over the next four years, several key units – as well as many supportive partners across UBC – will work to strengthen collaboration and align efforts on identified health and wellbeing priorities.

**Thrive: Supporting wellbeing in the face of the climate crisis »** As part of UBC’s annual Thrive month, the Climate Hub presented the “Acknowledging Climate Grief - Activating Hope & Action” workshop to address and respond to climate-related challenges that have impacted the mental health of our community. This engaging session encouraged participants to share their climate feelings, expand UBC’s climate community, and provide climate mental health and wellbeing resources, coping strategies, research and more.

**Food Hub Market pilot at Centre for Interactive Research on Sustainability »** In February, the Food Hub Market opened its doors to provide low-cost groceries for the UBC Vancouver campus in a welcoming community space. A collaborative pilot project led by the Office of Wellbeing Strategy, UBC Food Services, and the Sustainability Hub with funding from UBC’s Student Directed Initiative Fund, this initiative addressed campus food security and inspired conversation about what a future Food Hub at UBC could look like.

**Health promotion leaders establish global commitment to wellbeing »** In December 2021, UBC was among thousands of international health promotion leaders who met virtually for the World Health Organization’s 10th Global Conference on Health Promotion and to establish the “Geneva Charter for Well-being” — a global commitment to achieving equitable health and wellbeing outcomes for people and the planet based on input from 5,000 people from 149 countries.

Building on the 1986 Ottawa Charter for Health Promotion and nine global conferences on health promotion, this foundational document aims to inspire policy-makers and global leaders across diverse sectors towards concrete action.

**Visions for A Just, Food Future on Campus: IBPOC Students’ Stories of Food »** A collaboration between UBC’s Health Promotion & Education, the Office of Wellbeing Strategy, the University of Guelph and University of Waterloo, engaged eleven students in a participatory digital storytelling workshop exploring diverse food security experiences.

## UBC OKANAGAN

**Voice research tackles food security »** The goal of Voice research is to improve the way our campus is designed so that it’s healthier for all. Researchers use community-based participatory action research methods to explore factors that influence campus wellbeing and support collective action for systemic change. One of the latest projects focused on food security.

Drawing on Voice findings concerning student experiences related to food security, the team began a collective action phase to address identified needs. The Voice team worked in collaboration with the campus community to build partnerships to bring more local food on campus, launch a farmers market pilot project, and offer food skills workshops that incorporated practices to support sustainability goals. The team also garnered support for establishing a food hub on campus to expand these initiatives, and provide space for continued collaborative visioning and actions to support sustainable food practices.

## FEATURE STORY

### Move UBC: Moving for our minds, bodies and the planet

Move UBC is an annual, university-wide campaign to increase physical activity and reduce sedentary behaviour among UBC students, faculty, staff and community. Each February, the campaign invites UBC communities to explore ways to move that feel comfortable, empowering, and motivating for them.

Recognizing the intersectional nature of movement and its connection to sustainability, this year’s campaign incorporated new messaging around “moving for the planet” to align with campus-wide sustainability and climate action strategic plans by promoting movement as a means to reduce emissions and support our environment.

In addition, with Move UBC coinciding with Climate Emergency Week, stakeholders from the Wellbeing Physical Activity Committee, Sustainability Hub and Climate Hub partnered on various events, including the annual “Research Roundtable: Physical Activity & Climate Action”. This event highlighted the intersections between physical activity, climate action and social justice, encouraging UBC communities to explore ways of moving that positively impact our minds, bodies and the planet.



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15

wellbeing projects  
supported by Wellbeing  
Strategic Initiative Fund

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31,658

healthy \$3 student  
meals sold by UBC Food  
Services’ Food outlets

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35,290km

cycled during Go By  
Bike Week saving  
7,650 kg GHGs

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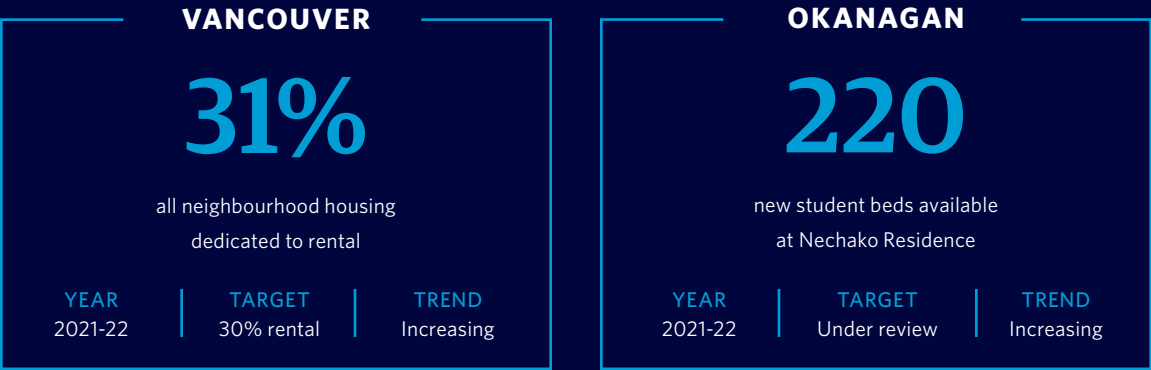
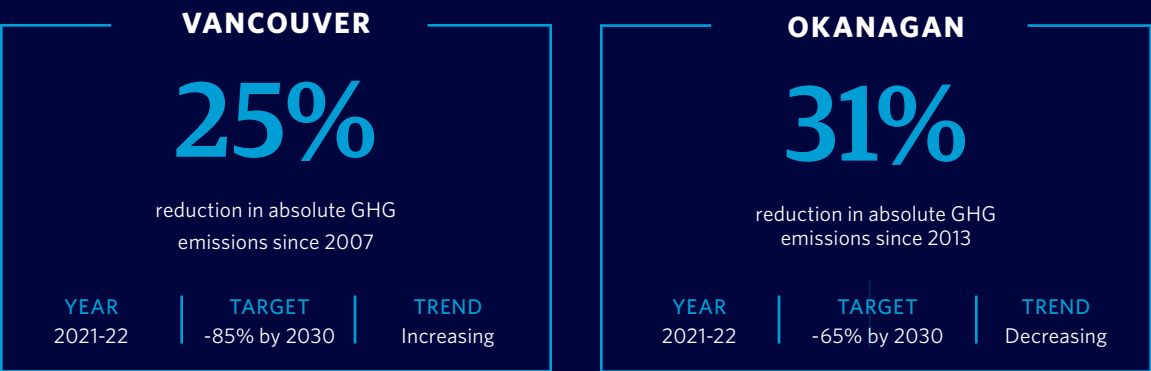
10<sup>th</sup>

World Health  
Organization conference  
attended



PERFORMANCE METRICS

Below is a snapshot of some of the metrics we use to measure performance against our sustainability goals. See more online at: <https://sustain.ubc.ca/dashboards>







THE UNIVERSITY OF BRITISH COLUMBIA

sustainability

