

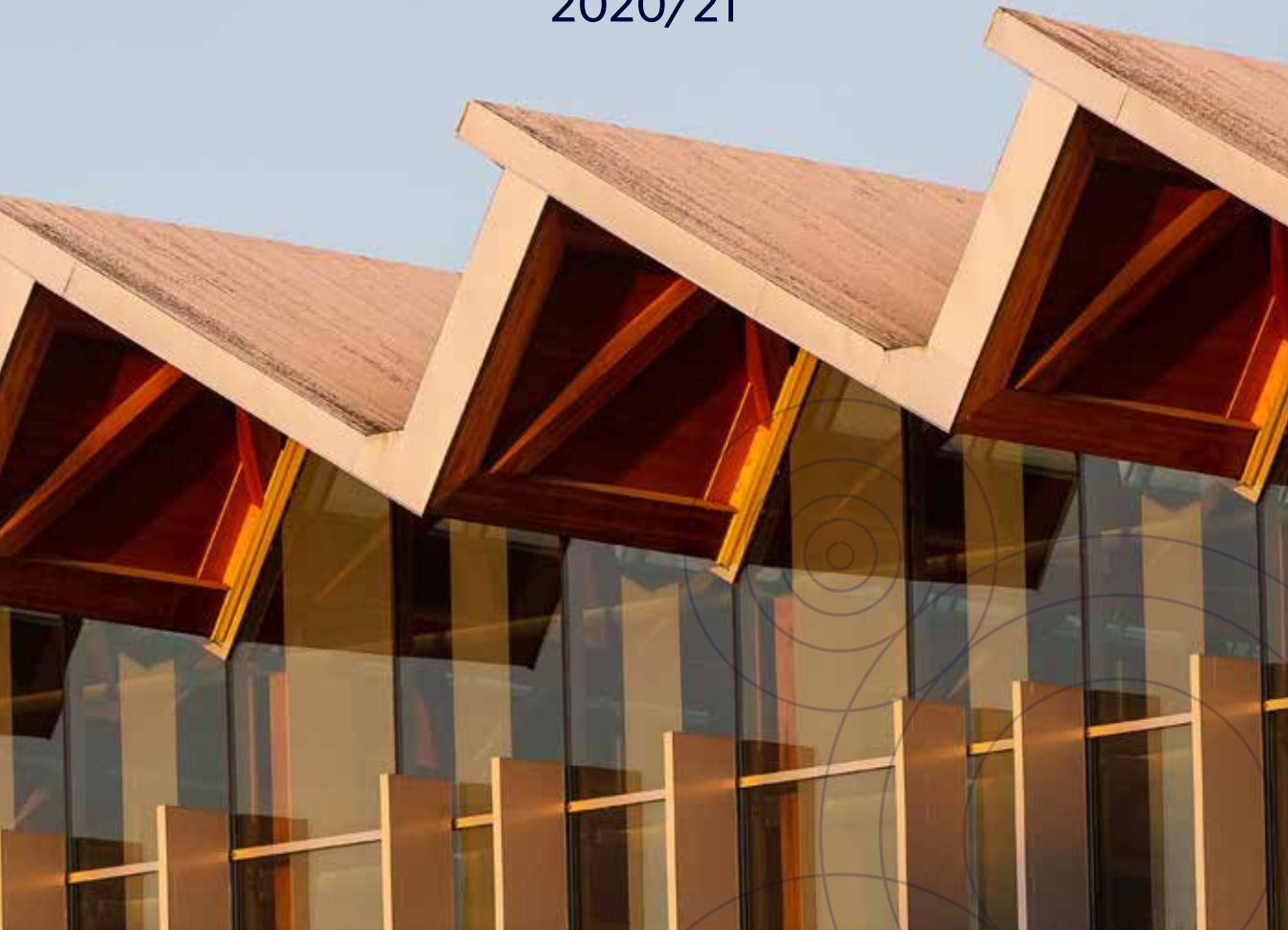


THE UNIVERSITY OF BRITISH COLUMBIA

sustainability

Annual Sustainability Report

—
2020/21



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.

UBC recognizes that the UBC Point Grey campus is situated on the traditional, ancestral, and unceded territory of the Musqueam (xwməθkwəy̓əm) people and that the Okanagan campus is situated on the territory of the Syilx Okanagan Nation.

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".





FOREWORD

The global pandemic continues to be a wakeup call for humanity. While greenhouse gas emissions dropped last spring as people quarantined at home, the parallels between climate change and the spread of disease became alarmingly clear. COVID-19 dominated global and local news, even as countries continued to act on the UN Sustainable Development Goals (SDGs) and pledged to, “Race to Zero” via economic recovery in the lead up to COP26 in Glasgow this fall.

At UBC, the climate emergency remains a key priority. This year, President Ono led meetings of like-minded university presidents through the University Climate Coalition (UC3), and unveiled an ambitious UC3 Climate Fellows program. Students mobilized to create a \$1.5 million Climate Emergency Fund to accelerate progress on recommendations from the Climate Emergency Task Force report. Campus + Community Planning ramped up consultation on a forthcoming Climate Action Plan known as CAP2030 that aims to phase out fossil fuel use across campus operations, and significantly cut emissions associated with commuting, food, waste, and business air travel to align with the Paris Agreement to limit global warming to 1.5 degrees Celsius. The Bioenergy Research Demonstration Facility expansion was completed in Vancouver. Skeena House at UBC Okanagan became the first ‘passive house’ dormitory in Canada. Researchers from the Faculty of Forestry surveyed the campus community to understand how nature helped people cope with isolation and stress during the pandemic. And climate education offerings grew, with new grant programs, an online collection of climate course listings, a new climate change guest lecture program, and increased free-access public education on climate justice.

At the same time, UBC explored the intersections between sustainability and equity, diversity, and inclusion more deeply this year. The adoption of the Indigenous Strategic Plan (ISP) committed the university to prioritize Indigenous human rights. An Anti-Racism Task Force was appointed to lead actions that create inclusive environments free from racism in which to work, learn and live. A new International Office plan, “In Service” underscored the societal obligations we hold as a major public university. And our Inclusion Action Plan focused on ensuring those who are historically, persistently, or systemically marginalized are treated equitably, feel respected, and belong. Integrated monitoring and reporting will tie together these complex and interconnected issues.

The global pandemic showed us how rapidly we can change. Calls to “build back better” post-pandemic as well as market transformation led to unprecedented public investment and a surge in renewable energy and green infrastructure. We can learn from how quickly we switched gears to hold virtual classes and meetings, and fast-tracked the creation of community gathering spaces like pop-up plazas in our cities.

Change is possible. Nature is demanding it. UBC will continue to inspire people, ideas, and actions for a better world.

LINDA NOWLAN

Senior Director, UBC Sustainability Initiative

MICHAEL WHITE

Associate Vice-President, Campus + Community Planning

ROB EINARSON

Associate Vice-President, Finance & Operations (UBCO)

PRIORITY | CLIMATE EMERGENCY

UBC's Climate Emergency Declaration in 2019 was followed by engagement with over 3,900 students, staff, faculty, alumni and community members. The resulting Climate Emergency Task Force (CETF) report includes significant new commitments and accelerated activities to achieve full divestment, meet our carbon zero goal by 2050, and support climate leadership and initiatives led by Indigenous, Black, and People of Colour.

The report was endorsed in principle by the UBC Board of Governors in February 2021, and in March the UBC Sustainability Initiative commenced the role of convening and coordinating implementation.

PRIORITY AREAS »



Operationalize UBC's commitments to climate justice: support climate leadership and initiatives led by Indigenous, Black, and People of Colour



Demonstrate institutional leadership on climate justice



Establish mechanisms and processes that ensure Indigenous perspectives, communities and worldviews shape the development and implementation of climate-related initiatives and policies



Expand, strengthen and coordinate climate research at UBC



Foster a culture of engagement and advocacy on climate action



Support community wellbeing in the face of the climate crisis



Expand climate education opportunities and resources for the UBC community and broader public



Develop new and strengthen existing partnerships to tackle the climate emergency



Accelerate emissions reductions at UBC Vancouver and UBC Okanagan in response to the Climate Emergency: Climate Action Plan 2030

- DECEMBER 5, 2019**
UBC declaration on the Climate Emergency
- FEBRUARY 27, 2020**
Engagement process begins
- MARCH 2, 2020**
Pop-up booths begin at UBC Okanagan
- MARCH 11, 2020**
Campus-wide forum
- MARCH 27, 2020**
Online survey closes
- JUNE 16, 2020**
Interim report presented at Board of governors meeting
- MAY TO JUNE 2020**
Virtual community dialogues
- JULY TO EARLY OCTOBER**
Final report writing
- FALL 2020 TO WINTER 2021**
Ongoing community and stakeholder engagement
- FEBRUARY 2021**
Report endorsed in principle by UBC Board
- MARCH 2021**
Implementation commenced

Stay up-to-date with the latest UBC Climate Emergency news and events, progress updates, and resources at: climateemergency.ubc.ca.



PRIORITY | EQUITY, DIVERSITY AND INCLUSION

The disproportionate impacts of environmental and social problems on marginalized communities directly connects sustainability with issues related to equity, diversity and inclusion. In response, the Climate Emergency Task Force report recommends leveraging UBC's Indigenous Strategic Plan and Inclusion Action Plan as a basis for long-term engagement with Indigenous communities, and examining and transforming institutional practices and policies that reproduce inequalities for IBPOC communities at UBC.

The following strategic plans and activities represent just some of the highlights of significant actions underway.

INDIGENOUS STRATEGIC PLAN » UBC's new Indigenous Strategic Plan, launched in 2020, outlines eight goals and 43 actions the university will collectively take to advance its vision of UBC as a leading university globally in the implementation of Indigenous peoples' human rights. The Office of Indigenous Strategic Initiatives provides support for implementation, including toolkits and resources, and will distribute a total of \$4 million in funding for projects by staff, faculty members, and students in 2022.

TASK FORCE ON ANTI-RACISM AND INCLUSIVE EXCELLENCE

» The Anti-Racism and Inclusive Excellence Task Force convened for an intense period of work beginning in March 2021. Six committees will put forward recommendations both on an interim basis throughout its mandate and in the form of a final report. The work of the Task Force is supported by the Office of the President and the Co-Executive Leads for Anti-Racism; Dr. Ainsley Carry, Vice-President Students, and Dr. Ananya Mukherjee Reed, Provost and Vice-President Academic, UBC Okanagan. The UBC Equity & Inclusion Office will lead implementation.

INCLUSION ACTION PLAN » The Inclusion Action Plan is a commitment to creating a welcoming community where those who are historically, persistently, or systemically marginalized are treated equitably, feel respected, and belong. The plan proposes a high-level framework for supporting collective action toward advancing inclusion at UBC over seven years. It features 36 actions under five key goals including (1) Recruitment, Retention, and Success; (2) Systems Change; (3) Capacity Building; (4) Learning, Research, and Engagement; and (5) Accountability.



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.

TEACHING AND LEARNING

Each year, thousands of students learn about issues like the climate emergency, biodiversity, food systems, racial equity, and social justice through courses and programs offered by diverse faculties and 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 interdisciplinary education grants and faculty fellowships.



NEW CLIMATE CHANGE COURSES TOOL » A new tool from the UBC Sustainability Initiative curates climate change-focused courses at UBC Vancouver. The tool showcases 48 courses in 24 subjects from seven faculties; including course descriptions, learning outcomes, instructor details and links to the syllabus where available. Now students can find climate change courses more easily than ever before.

CLIMATE EDUCATION GRANTS AWARDS » The result of \$50,000 in Climate Action funding, new Climate Education Grants aimed to quickly improve the depth and delivery of climate change content and teaching approaches in existing courses. Grants up to \$5,000 each were awarded to ten instructors from UBC Vancouver and Okanagan to update 15 existing undergraduate and graduate courses across 8 Departments. Course revisions are currently underway that will collectively impact more than 3,300 students per year.

ARTS AND SCIENCE COLLABORATE TO CREATE NEW CLIMATE CREDENTIAL » To meet the student demand for climate education, instructors from the departments of Geography and Earth, Ocean and Atmospheric Sciences teamed up to develop a new interdisciplinary climate change credential for undergraduate students. This project, supported by one of six Interdisciplinary Education Grants provided by the UBC Sustainability Initiative, will be ready for launch in September 2022.

STAMINA FOR SUSTAINABILITY » A new experiential learning course open to undergraduate and graduate students interested in thinking critically about sustainability launched in summer 2020 and was delivered virtually due to COVID-19.

VANCOUVER

\$50k

in Climate Education Grants to revise 15 courses

VANCOUVER

3,300

students per year learning about climate in revised courses

VANCOUVER

48

climate change courses in new listing tool

VANCOUVER

6

Interdisciplinary Education Grants to develop new courses/programs

UBC 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.

UBC CLIMATE EMERGENCY FUNDING SUPPORTS RECORD NUMBER OF STUDENT INTERNSHIPS »

Funding of \$140,000 provided an additional 36 students the opportunity to bring their skills and expertise to answering complex sustainability questions posed by NGOs. Working with these NGOs enabled students from a wider variety of academic departments than usual to participate in the program.

New partners this year included Atira Women's Resource Society, Ecojustice, Minerva BC, Sierra Club of British Columbia Foundation, South Vancouver Neighbourhood House, Squamish Nation, Watershed Watch Salmon Society, and more.

CLIMATE JUSTICE THROUGH LEGAL REFORM » A number of Sustainability Scholars explored issues of legal reform. One Scholar developed a dashboard of environmental harms to enhance access to environmental justice for racialized and Indigenous communities. Another explored legal reform to support regenerative, communal and distributive models of production and consumption in Canada. A third contributed to a discussion paper on free, prior and informed consent for mining in Indigenous lands.

CLIMATE ANXIETY FOCUS » Three Sustainability Scholars explored the links between climate change, mental health, resilience and community wellbeing.



Applying an equity lens to sustainability research

The Sustainability Scholars Program is supporting an increasing number of projects that apply an equity lens. This year, 18 projects explored sustainability and systemic inequality. Projects ranged from equitable engagement in transportation planning, to centring equity and affordability in climate action plans, Indigenous self-determination, social housing and more.

One project explored the circular economy as part of the post-pandemic recovery. "Until recently, the circular economy discourse has centered around a technological, economic, and business shift. However, it is being increasingly recognized that this transition will also have large social implications," noted Sustainability Scholar Neha Sharma-Mascarenhas.

This project provided evidence-based nuances to the policy discourse on Vancouver's emerging circular economy.

Sharma-Mascarenhas added, "being able to contribute to a project that aligns with my interests, and informs Vancouver's policy pathways to a green and just circular recovery, brings immense meaning to my [doctoral] research."

SEEDS SUSTAINABILITY PROGRAM

The SEEDS Sustainability Program creates applied student-led research and interdisciplinary partnerships between students, faculty, staff and community. An internationally recognized Campus as a 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.



CLIMATE-FRIENDLY FOOD LABELS PILOT » SEEDS student researchers completed a GHG assessment of all the ingredients and menu items at a high volume residence dining hall and one retail outlet. Launching a climate friendly food label in fall 2021 will coincide with shareable toolkits and engagement materials, followed by formal evaluation and expansion to other food vendors on campus.

INTERDISCIPLINARY RESEARCH CLUSTER ACCELERATES CLIMATE ACTION » SEEDS was awarded \$50,000 in UBC Climate Emergency funding to create 35 student curricular and co-curricular opportunities. Students worked with faculty and staff on six focus areas, including ecological connectivity & green corridors, air travel emissions, climate justice, bridging approaches to climate adaptation, biomimicry, and low carbon food systems.

NEW RESEARCH TO CURB INTERCAMPUS AIR TRAVEL EMISSIONS » Novel dual-campus applied research to analyze patterns of air travel between UBC's Vancouver and Okanagan campuses. The second phase will involve identifying methods of reducing inter-campus air travel and provide policy recommendations.

KNOWLEDGE EXCHANGE WORKSHOPS CONNECT CLIMATE AND NATURE CRISES » Interdisciplinary workshops promoted community dialogue among over 250 participants on connections between the climate and nature crises, and developed ideas for accelerating action on climate change and urban biodiversity loss.

UBC's first biodiversity days

In honour of UN International Day for Biological Diversity, the SEEDS Climate Crisis in Urban Biodiversity (CCUB) initiative collaborated with the UBC Botanical Garden to launch UBC's first Biodiversity Days – a two week-long series of experiences to celebrate biodiversity and its importance to our communities, health and planet.

The event saw over 4,000 participants engage in a broad spectrum of workshops, tours, and showcases on a variety of topics including: biodiversity in a changing climate; birds and biodiversity; climate mitigation and adaptation; forest biological diversity; biodiverse food systems; the launch of an innovative bird-friendly decal installation at the Botanical Garden Pavilion building; pollinator bioblitz; plant propagation, and more.

In addition, the UBC Biodiversity and Climate Action Ideas Showcase celebrated UBC student and community-led research on biodiversity and climate action, and identified of a series of potential pilot projects that can further tackle climate change and urban biodiversity loss together.

STUDENT ENGAGEMENT

Student engagement is at the heart of sustainability learning at UBC. Through immersive, transformative, and experiential learning experiences, 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 TACKLE CIRCULAR ECONOMIES, SPORTS, SOCIAL JUSTICE AND INDIGENOUS ISSUES

» This year 24 students formed six major projects teams to host a series of projects, events, and competitions in collaboration with staff from various departments. Outcomes included engaging over 600 UBC community members through events, two Sustainability Career Nights, and three new "Play it Green" sport and sustainability podcasts.

UBC READS SUSTAINABILITY EVENTS DRAW 500+

» The UBC Sustainability Initiative organized three UBC Reads Sustainability events in partnership with several other on-campus groups.

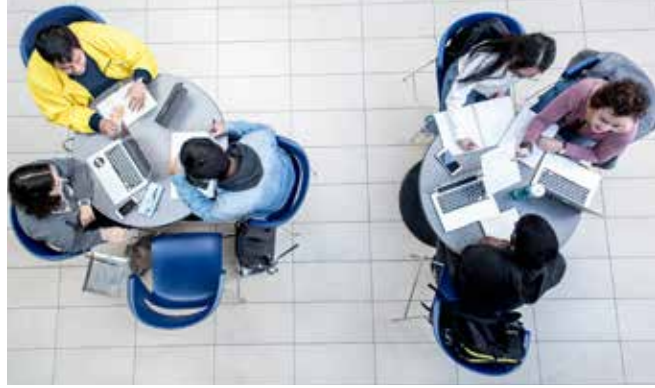
- *Climate Anxiety* | Sarah Ray
- *The Great Derangement* | Amitav Ghosh
- *The Right to be Cold* | Sheila Watt-Cloutier

The events were enjoyed by over 500 attendees, with post-event surveys indicating 95-98% found these talks informative and engaging.

UBC 2030 COMPETITION ATTRACTS OVER 40 STUDENT IDEAS

» A competition launched by the UBC Sustainability Initiative drew more than 40 inspiring visions and solutions from students and student groups, responding to the question: "What will sustainability at UBC look like in 2030?"

SEVENTEEN STUDENT GROUPS JOIN STUDENT SUSTAINABILITY COUNCIL » Student groups on the Council provide feedback on sustainability-related projects, programs, and initiatives at UBC.



New climate justice webinar series watched by over 2,000

In response to the focus on climate justice as part of UBC's Declaration of a Climate Emergency and recommendations from its Climate Emergency Task Force Report, the UBC Sustainability Initiative launched the Climate Justice Webinar Series, featuring sessions that examined climate justice from various perspectives, locally and globally.

In partnership with the Pacific Institute for Climate Solutions, UBC Climate Hub, and the School of Public Policy and Global Affairs, seven online events attracted more than 2,000 attendees over the space of six weeks. The topics were broad and connected issues of racial and social justice, urban planning, colonialism, legal and policy frameworks, sustainable agriculture, resource extraction, gender and environmental justice, and the responsibility of post-secondary institutions like UBC to address them.

Speakers included Vancouver City Councillor, Christine Boyle, environmental lawyer, Eugene Kung, MLA, Bowinn Ma, lawyer, Temitope Onifade, artist and counsel to the Haida Nation, Terri-Lynn Williams-Davidson, community organizers, Ph.D., Masters, and undergraduate students, and 12 UBC professors from a diverse range of faculties.

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 committed to making a positive contribution to sustainability.



NEW AMS SUSTAINABILITY STRATEGY » The AMS Sustainable Action Plan prioritizes actions through the lens of the United Nations 2030 Sustainable Development Goals. The plan combines sociocultural, economic, and environmental factors of sustainability into an actionable vision that intersects with AMS priorities involving advocacy, operations, and student services.

UBC CLIMATE HUB DELIVERS NEW CLIMATE EDUCATION AND WELLBEING PROGRAMS » In addition to supporting UBC’s Climate Emergency engagement and Climate Emergency Task Force Report, the student-led UBC Climate Hub – made up of UBC paid student and non-student staff – delivered significant new projects including the Climate Solutions Showcase, and the Climate Justice Research Collaborative. Climate wellbeing highlights included 10 climate mental health and wellbeing workshops, and a webinar with the British Consulate.

UBC SDG ALLIANCE LAUNCH NATIONAL NETWORK » This student-led initiative partnered with other student-led clubs at the University of Calgary, the University of Waterloo, and Université Laval to launch Reimagine 17 across Canada.

STUDENTS CREATE \$1.5M CLIMATE EMERGENCY FUND » Advocacy by the UBC Climate Hub, working closely with elected AMS and GSS student leaders, led to support by the administration for the creation of a \$1.5 million Climate Emergency Fund (CEF) made up of incremental funding from tuition fees, to support climate-focused student projects.

Climate Teaching Connector

The Climate Teaching Connector – a collaboration between the UBC Sustainability Initiative and the UBC Climate Hub – is an innovative new program to integrate climate-related content into undergraduate classes by connecting UBC course instructors with climate change and climate justice experts from the UBC community.

During its inaugural year in 2020-21, fifteen climate experts (graduate students and post-doctoral fellows) delivered 22 guest lectures across 18 departments to 1,357 students.

“The Climate Teaching Connector is a great resource linking learners, faculty and researchers with multidisciplinary perspectives and resources needed to inspire, promote and sustain climate awareness and action.

My undergraduate students in PLAN 331 (The Just City in a Divided World) learned immensely from our guest Climate Expert who gave rich examples on climate vulnerabilities generated from an understudied region and connected these insights to our other lessons on urbanization, city justice, urban revitalization, and climate migration grounded on histories of colonialism, militarization, and economic development.” – Dr. Leonora C. Angeles, Associate Professor, SCARP & Institute for Gender, Race, Sexuality, and Social Justice.

CAMPUS PROGRAMS

Engagement programs for students, staff, and faculty help implement our campus sustainability plans and advance a culture of sustainability. This year, we continued to focus on high-impact areas including research laboratories, while pivoting to virtual engagement opportunities for staff, faculty and students working and living remotely.



5,400 STAFF ATTEND VIRTUAL WORKSHOPS, NETWORKING ACTIVITIES » Education, training, and funding activities to enhance workplace sustainability this year supported:

- Sustainability Coordinators in 64 departments/units
- Workplace Sustainability Grants for five projects, including for the UBC Library and UBC Farm Centre for Sustainable Food Systems
- New Sustainability Representative Online Directory to connect community members
- ‘Shut the Sash’ competition at labs in Chemistry D and E took part over six weeks saving the equivalent of over 110,000 kWh in annual energy savings
- Lab Plastics Recycling Program engaged 15 new labs to recycle plastic; expanded amber glass recycling
- Ultra Low Temperature Freezer rebate program encouraged researchers to upgrade to more energy efficient freezers, and to lower freezer set points by 10 Celsius which can reduce energy consumption by an average of 20%

NEW COMMUNICATIONS AND ENGAGEMENT INITIATIVES UNDERWAY » As part of UBC’s Climate Action Plan 2030 development process, a cross-campus Engagement and Outreach Programs Working Group identified a suite of communications and engagement recommendations to further mobilize the UBC campus community.

THE POWER OF YOU (OKANAGAN) » UBCO’s behaviour change program, The Power of You, shifted from on-campus to online, focusing on sustainable and active modes of transportation.

Engagement activities this year included:

- An awards celebration for the Shut the Sash Challenge, which saved 8,401 kWh, 94 GJ and 5 tCO₂e in energy and emissions and engaged over 40 students
- Virtual cycling webinars to promote road awareness and education to support active transportation and commuting
- A building audit that resulted in over 3,750 lights and 17 projectors/ screens being turned off or powered down to conserve energy

VANCOUVER

64

operational and academic departments engaged

VANCOUVER
OKANAGAN

35,290

km cycled for GoByBike week saving 7,650 kg in GHG emissions

VANCOUVER

100

sustainability coordinators in offices and labs

OKANAGAN

3,750

lights turned off during Lights Off campaign

RESEARCH

UBC is a global leader in researching, developing, and demonstrating sustainable practices. With over 400 faculty investigating sustainability, our goal is to excel across the spectrum of fundamental and applied research. Below are some examples of groups and projects - just a small selection from an incredible breadth of work across the university.



Featured Research Groups

NEW CENTRE FOR INDIGENOUS FISHERIES »

The new Centre will bring together Indigenous and Western scientific approaches and framings equitably and ethically through, for example, the practice of Etuaptmunk (Two-Eyed Seeing, or the gift of multiple perspectives). By training students in the fundamentals of aquatic science via experiential learning and practice in traditional territories, the Centre will support the management and protection of culturally significant fish and fisheries in ways that uphold and respect Indigenous rights, values, practices, and knowledge systems.

CENTRE FOR LAW AND THE ENVIRONMENT »

The Centre is an umbrella for environmental law researchers at Allard; it has three main focus areas. (1) Advancing research about law and the environment by Allard faculty members, students and visitors; (2) Enhancing environmental law education at Allard and beyond; and (3) Promoting action toward environmental justice and sustainability through various public-facing activities.

WILDFIRE AND CARBON - NATURAL RESOURCES

CANADA PARTNERSHIP » Scientists from UBC's Faculty of Forestry are working in partnership with Natural Resources Canada and others to develop strategies for wildfire and forest management that reduce wildfire greenhouse gas emissions and increase the carbon sink capacity of forests in western North America. Supported by \$1 million from the Pacific Institute for Climate Solutions (PICS).

THE OKANAGAN INSTITUTE FOR BIODIVERSITY, RESILIENCE, AND ECOSYSTEM SERVICES »

The Institute is a group of over 30 faculty members and their graduate students working in ecology, biodiversity and conservation, and environmental sustainability on UBC's Okanagan Campus. The underlying motivation of the Institute is to increase scientific understanding of ecological systems and to inform management and planning decisions that promote the preservation of biodiversity and ecosystem services in terrestrial, marine and aquatic systems.

VANCOUVER

385

faculty researching sustainability-related topics

VANCOUVER

67%

departments with faculty researching sustainability-related topics

VANCOUVER

43

sustainability-related degree programs

VANCOUVER

175

research groups exploring sustainability-related issues



Campus as a Living Lab competition seed funds urban innovation research

The Campus as a Living Lab (CLL) competition provides seed funding to support faculty-led research that uses the campus as a living lab for urban innovation. Four awards of up to \$50,000 were distributed to researchers collaborating with operations staff. The 2020-21 CLL competition was managed by the UBC Sustainability Initiative.

Projects covered diverse topics such as building a carbon capture ecosystem; reimagining indigenous-centred campus recreation; using 5G data for natural asset management and integration; and developing a community food security hub. Each project involves the trial of an innovation component on the campus' lands, buildings and infrastructure, and aligns with UBC's strategic sustainability priorities.

"Reviewing these proposals gave the committee insight into the broad range and quality of new sustainability-focused research projects coming from UBC faculty," commented Helen Burt, Associate Vice-President Research & Innovation.



Cool and COVID-safe: How radiant cooling could keep our cities comfortable and healthy

A novel system of chilled panels that can replace air conditioning can also help reduce the risk of COVID-19 transmission. UBC research published in the COVID-19 edition of Applied Energy, showed the system can save up to 45 per cent of the required energy, while ensuring building occupants are comfortable and rooms are adequately refreshed.

Dr. Adam Rysanek, Professor in the School of Architecture and Landscape Architecture and co-author of the paper, noted that many public health guidelines, as well as building industry bodies, recommend increasing the flow of fresh, outdoor air into buildings in order to reduce the risk of spreading COVID-19.

"If we continue to rely on conventional HVAC systems to increase indoor fresh air rates, we may actually double energy consumption. Alternatively, we can encourage people to install new types of radiant cooling systems," noted Rysanek.



UBCO partners with Engineering Faculty to develop Utility Tracking tool

UBC Okanagan has entered into a three-year partnership with the campus' School of Engineering faculty to develop a data analytics platform. This project aims to produce an intelligent data-driven energy monitoring and management system using statistical and advanced data analysis methods. A utility tracking tool was also developed to track overall campus utility consumption (e.g., electricity), and building-level consumption at the monthly, quarterly, and annual interval.

Key departments have been working to advance and update the Infrastructure HVAC Asset Management database. This involves consolidating campus-wide direct digital controls (i.e., building automation systems), physical meters and manual metering points in one location, as well as further developing a meter tree. This project will provide further input to the Data Analytics platform in the future.



UBC's first off-campus living lab research focuses on climate, affordability and social equity

The UBC Sustainability Initiative - in collaboration with the BIM TOPiCS Lab under Dr. Sheryl Staub-French - is partnering with industry and government on the development of an affordable rental housing pilot project in Vancouver. The pilot will help BC Housing evaluate innovative building materials and designs aimed at tackling affordability, inclusion and climate change.

The Vienna House project will showcase innovations designed to deliver high performance with very low greenhouse gas emissions, prefabricated building components made from renewable materials, and an integrated design process that brings industry and research partners together at regular intervals to solve project challenges and maximize opportunities for efficiency.

"This project represents a path-breaking approach that seeks to simultaneously address housing affordability in Vancouver, while offering an innovative, zero-emission building standard," explained Binoy Mascarenhas, acting Urban Innovation Research Director, UBC Sustainability Initiative.



Exploring 5G technology options for proactive natural asset management

How can 5G support nature-based solutions for sustainable cities?

An interdisciplinary group of UBC researchers is examining how 5G can support natural asset planning and management. In partnership with Rogers, Mitacs, and the Urban Data Lab, the Urban Natures Lab is deploying environmental and human sensors at multiple spatial scales to:

- Monitor the responses of natural assets to environmental conditions and human usage, enabling proactive natural asset maintenance
- Assess human movements under different climatic and built environment conditions, supporting human-centred urban forest planning and design
- Plan and manage natural assets to improve their resilience and as adaptive nature-based solutions to climate change impacts

"While this system is currently in the pilot phase, it will gradually scale up to provide important data to make cities more resilient and more liveable." Lorien Nesbitt, Assistant Professor, Urban Natures Lab, Faculty of Forestry.



Tellurium Boosted Li-S Batteries for Zero-Emission Vehicles

This project aims to develop a solid-state, lithium tellurium-sulfur (Li-TeSx) battery with doubled energy capacity and higher safety than the conventional lithium-ion batteries powering electric vehicles (EVs) today.

Project principal investigator and UBC Okanagan Assistant Professor, Jian Liu, says tellurium's high electrical conductivity and high volumetric properties could enable greater energy storage and faster charging - ultimately meaning extended EV range and convenience for drivers.

"People have been looking into sulphur batteries for many years, but it is challenging to commercialize because sulphur doesn't transport electrons at all," he said. "We are looking for a way to balance electronic conductivity with energy density as a way to make lithium-sulphur batteries viable."

This UBC-led PICS project is supported by the Government of British Columbia, National Research Council, Foundation for Innovation, BC Knowledge Development Fund, Mitacs Accelerate Program and others.

The background image shows an industrial facility, possibly a power plant or water treatment plant, with a prominent wooden roof structure. The facility features various pipes, valves, and machinery. Yellow safety railings are visible on the walkways. The scene is set outdoors, with green trees visible through the open sides of the structure.

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, reduce greenhouse gas emissions, improve environmental performance, and achieve cost savings, while leveraging our campus infrastructure and built environment to demonstrate innovative sustainability solutions at a municipal scale.

ENERGY AND EMISSIONS

UBC's Vancouver campus now produces 29% fewer GHG emissions than it did in 2007, while institutional floorspace increased by 25% during the same period. In the Okanagan our focus on sustainable buildings has achieved a 41 percent reduction in absolute GHG emissions vs. 2013, simultaneous with a 14% rise in floorspace.



NEW CLIMATE ACTION PLAN 2030 » In UBC's most ambitious climate action planning process yet – UBC Vancouver and Okanagan have engaged in a Climate Action Plan 2030 process (CAP2030) to meet and exceed the 1.5C emission reduction target adopted by 196 Parties at COP21 in Paris, on 12 December 2015. For the first time, CAP2030 will commit UBC to work with its community members to address the “extended impact” emissions associated with commuting, air travel, food, and waste.

UBC Vancouver

BUILDING TUNE-UP PROGRAM SAVES OVER 38,000 GJ OF NATURAL GAS PER YEAR » UBC's Energy & Water Services Building Tune-Up program is now saving over 11 GWh of electricity and 38 thousand GJ of natural gas per year, representing over \$1 million per year in energy cost savings. This is a GHG emissions reduction of 1176 tCO₂e/yr – the equivalent of taking 360 passenger vehicles off the road. In 2020, a revamped version of the program was initiated – jointly funded by BC Hydro and FortisBC – to investigate new opportunities for energy conservation.

BIOMASS ENERGY EXPANSION » This year we installed a new 12 MW biomass fuelled hot water combustion boiler in the Bioenergy Research and Demonstration Facility (BRDF). The boiler will generate 70% of the hot water needed for the district energy system, improve efficiency, save costs, and significantly reduce GHG emissions associated with natural gas use.

UBC Okanagan

THIRD PHASE OF LOW CARBON ENERGY STRATEGY COMPLETE » The third phase of our Low Carbon Energy Strategy, which guides future low carbon district energy system development and investments, was completed in 2020. Recommendations include the design of high-lift heat pumps and thermal storage to displace natural gas use.

NEW 10-YEAR STRATEGIC ENERGY MANAGEMENT PLAN » The new plan includes a suite of projects estimated to reduce annual energy consumption by 882,700 kWh and 11,260 GJ, reducing emissions by 564 tCO₂e (the equivalent of taking 111 passenger vehicles off the road.)

VANCOUVER

53%

energy consumption from low-carbon sources

VANCOUVER

48%

reduction in GHG emissions per student since 2007

OKANAGAN

41%

reduction in absolute GHG emissions since 2013

OKANAGAN

60%

reduction in GHG emissions per student since 2007

WATER

Efficient water use, greater resilience in the face of increasing drought periods, and effective management of heavy rainfall events are important goals at UBC. 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

RAINWATER HARVESTING AT UBC AQUATIC CENTRE SAVES MILLIONS OF LITRES PER YEAR »

Optimizing the rainwater harvesting system at the UBC Aquatic Centre in February 2021 supplied 338,000 litres of water for toilets, pool top-ops and irrigation - reducing the demand for potable water.

CLIMATE ADAPTATION & RESILIENCY STRATEGY »

UBC has begun to scope a climate adaptation and resiliency strategy. This effort will include adaptation and resiliency efforts more broadly, but will also involve updating UBC's Integrated Stormwater Management Plan and related guidelines.

SEEDS RESEARCH SUPPORTS GREEN

INFRASTRUCTURE » Drawing ideas from biomimicry, biophilic design, ecological connectivity and symbiotic relationships, SEEDS research students assessed ecological connectivity at UBC Vancouver and proposed new design strategies to improve stormwater

management, air quality, and ground-water emergency supply to address demand during a potential seismic event or major service disruption.

UBC Okanagan

NECHAKO RESIDENCE AND COMMONS BLOCK DESIGN REDUCES IRRIGATION, STRENGTHENS LOCAL ECOLOGY »

The Nechako Residence and Commons Block building design incorporates a raingarden to retain water as part of an overall designed system to manage rainwater within the campus boundaries. This will achieve the Whole Systems Infrastructure Plan's goal of 100% diversion of rainwater from municipal systems.

COVID-19 CLOSURE AND OPERATIONAL

IMPROVEMENTS CUT WATER USE » A 23% reduction in overall campus water use during 2020 was achieved in part due to COVID-19 related remote working and learning, and a reduction in irrigation requirements during shoulder seasons.

VANCOUVER

76%

reduction in water use intensity per student since 2000

VANCOUVER

59%

reduction in absolute water consumption since 2000

OKANAGAN

14m³

water use per student in 2020

OKANAGAN

36%

reduction in water use intensity per student since 2013

WASTE AND MATERIALS

UBC Vancouver's Zero Waste Action Plan targets 80 percent overall waste diversion by 2020, while the Okanagan campus strives towards full waste recovery and reuse. Achieving this 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

NEW WASTE SENSORS PILOT PROJECT » A new system uses rugged, industrial sensors to collect data on waste bin fill level and contents. Data is processed using cloud computing, artificial intelligence and machine learning to create more efficient waste collection schedules and to identify containers contaminated with non-recyclable items.

AMBER GLASS RECYCLING PROGRAM EXPANDS » Non-hazardous amber glass bottles are collected and recycled, reducing UBC's waste-related GHG emissions and environmental impact. Operating in Michael Smith Laboratories since 2017, the program diverts approximately 1,000 kg annually and recently expanded to include the Life Sciences Centre.

NEW GEL ICE PACK REUSE INITIATIVE » UBC Life Sciences Centre donated hundreds of difficult-to-recycle gel packs to sustainable produce company SPUD for washing and reuse.

UBC Okanagan

COMPOST PROGRAM EXPANDS TO ADDRESS COVID-19 RELATED WASTE » This year saw an 80% increase in the collection of compostable material over the previous year, due in part to an expanded list of accepted items including all organics, bones, carbohydrates and proteins. It also allows for single-use, compostable take-out containers and utensils, pizza boxes, and paper hand towels – all of which were used in greater quantities to meet COVID-19 food service protocols.

PAPERCUT™ AND REDUCING CONSUMPTION LOWERS EMISSIONS BY 81% » Using PaperCut™, a user-driven online based printing program, paired with the reduced on-campus population, allowed for an 81% reduction in paper related greenhouse gas emissions. The campus also purchased 7,153 fewer packages of paper, equal to saving 3.78 million sheets per year.

VANCOUVER

53%

overall waste diversion rate

VANCOUVER

36%

reduction in operational waste disposed since 2010

OKANAGAN

43%

reduction in annual waste disposed per student since 2010

OKANAGAN

34%

increase in waste diversion rate 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 integrated approach to energy efficiency, low carbon district energy, and climate adaptive design support an equivalent goal of net-positive performance.

UBC Vancouver

NEW LEED IMPLEMENTATION GUIDES » Updated LEED Implementation Guides address environmental impacts of buildings materials, for example by setting embodied carbon reduction credits.

GATEWAY SOUTH PROJECT EXPLORES ZERO CARBON BUILDING STANDARD » Building design is pursuing both operational and embodied carbon as a pilot for advancing UBC's Green Building Action Plan and emerging Climate Action Plan 2030.

HIGHER PERFORMANCE IN RESIDENTIAL BUILDINGS THROUGH REAP » Improvements to the Residential Environmental Assessment Program (REAP) include climate ready requirements, embodied carbon reporting, and incentives for urban biodiversity.

UBC Okanagan

SKEENA RESIDENCE ON TRACK TO BECOME THE FIRST PASSIVE HOUSE DORMITORY IN CANADA » The benefits of Passive House include thermal comfort, energy, carbon, and noise mitigation. The Skeena Residence was also awarded the Environmental Performance Award for the 2020 Wood Design Awards, Canadian Wood Council.

NECHAKO RESIDENCE AND COMMONS BLOCK TARGETS LEED® GOLD » Targeting LEED® Gold certification, this residence will be the latest building connected to the low carbon district energy system.



Building retrofits address energy efficiency and carbon reductions

A major renovation to the Hebb Building was recently completed at UBC Vancouver.

Renewal of the 1960s modernist building included space reconfiguration to support contemporary pedagogy, seismic upgrades and energy efficiency upgrades – such as a high performance re-skinned airtight façade and updated mechanical system. The project is LEED (Interior Design and Construction) Gold certified.

In addition, the Life Sciences Building underwent expansion of the heat recovery chiller in 2020. A study was conducted to quantify the savings associated with adding a third chiller module to the existing two 70 ton modules. With favorable results, UBC added a new 70-ton module to the existing two modules.

The project is expected to save 5,844 GJ of thermal energy annually, resulting in \$45,000/yr of net energy savings, 166 tCO₂e/yr reduction in emissions (equivalent to taking 51 cars off the road), and a 6.7 year simple payback before incentives.



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 in.

COMMUNITY PROGRAMS

UBC campuses are vibrant, sustainable, connected communities of students, faculty, staff, and campus residents. While COVID-19 limited our ability to gather in person, our goal remained to spark imagination and foster an inclusive and welcoming campus. We were inspired by the compassion and creativity of the community who supported each other through our programming and initiatives.



UBC Vancouver

This year we continued to provide opportunities to create a vibrant, connected, and inclusive community – all through virtual methods.

WHAT LIGHTS YOU UP? COMPETITION » Community members at UBC and the University Neighbourhoods Association were invited to share what brings them joy with an artwork or animation that answered the prompt, “What Lights You Up?” The winning designs were projected onto the paving stones of Raymond and Money Lee Square for everyone to enjoy.

KIDS TAKEOVER UBC » While kids weren’t able to take over UBC’s physical spaces this year, we still made the fun and learning interactive. Online treehouse provided free musical performances, family-friendly theatre, hands-on workshops and more, courtesy of 14 UBC departments that partnered to provide activities.

UBC PRIDE ONLINE » We celebrated UBC Pride with a month-long series of online events and programming showcasing the beauty of all sexual and gender identities. An artist’s showcase, a research panel, voguing lessons and more – there were many ways for the community to take part.

UTOWN@UBC KIDSFIT, CHEF CHALLENGE, HARVEST FESTIVAL » We reimagined several beloved events and programs in an online format that continued to provide opportunities to create engaged and resilient communities through programming, partnerships, and capacity-building.

Community of Caring grants

When COVID-19 physical distancing was introduced, we launched the “Community of Caring” grants to encourage the UBC community to share their creative ideas for fostering social connection – from afar.

Here are just a few ways community members shared their talents and showed their support for one another:

Postal Art: This project connected youth in campus neighbourhoods as pen pals. Participants received a custom letter writing kit filled with art supplies to keep in touch.

Beyond the Book: Participants took part in meaningful discussion around social justice topics while reading Charlene Carruthers’ Unapologetic: A Black, Queer, and Feminist Mandate For Radical Movements and discussed their thoughts, feelings, and learnings.

Summer Balcony Meet & Greet: The strata council at the Pemberly Residences organized care packages for a pandemic-friendly event that brought neighbours out on their balconies to enjoy tea and treats together from a safe distance.

TRANSPORTATION

UBC's two main campuses are a destination for students, staff, faculty, residents, alumni and visitors from across the region. However, this year our COVID-19 campus closure dramatically reduced all trips to both campuses—and remote work arrangements enabled us to maintain services while further reducing commuting emissions.



UBC Vancouver

ADVOCACY WITH INDIGENOUS PARTNERS AND MUNICIPALITY SUPPORTS SKYTRAIN »

Representatives from the City of Vancouver, UBC, and Musqueam, Squamish and Tsleil-Waututh First Nations renewed discussions with the federal government on the funding needed to extend the SkyTrain Millennium Line further west of the future Arbutus Station to reach the UBC Point Grey campus.

SEEDS PROJECTS EVALUATE NEW WAYS TO DECARBONIZE TRANSPORTATION »

Students from Urban Systems and Chemical and Biological Engineering worked across three SEEDS research projects to investigate ways to decarbonize transportation systems. Research evaluated bicycle parking facilities, campus parking policies, and inter-campus air travel emissions between the Vancouver and Okanagan campuses.

Note: COVID-19 campus closures dramatically reduced all trips to both campuses in 2020-21, significantly affecting the performance metrics below.

UBC Okanagan

UBC OKANAGAN TRANSPORTATION PLAN UNDER DEVELOPMENT »

The emerging plan includes commuting targets that will require a shift towards more sustainable modes of travel. Emissions associated with commuting are the largest of all campus emissions sources, and therefore the focus of targeted reductions in both the UBCO Transportation Plan and the UBCO Climate Action Plan 2030. Strategies may include infrastructure improvements, transportation demand management, and new ways to reduce single occupancy vehicles.

UBCYCLES LAUNCHES BIKE DONATION PROGRAM »

The UBC Okanagan's UBCycles team initiated a Bike Donation program to support the campus' active transportation efforts. The program, operated year-round, will help reduce the costs associated with acquiring bicycles and parts, provide opportunities to purchase bikes at a low cost, and offer bike maintenance training. In the future, the program intends to offer Build Your Own Bike workshops where new bike mechanics will be trained.

VANCOUVER

26%

of all trips to and from campus by transit (2020)

VANCOUVER

32%

of all trips by sustainable modes of transport (2020)

OKANAGAN

43%

of all trips by sustainable modes of transport (2019)

OKANAGAN

20%

of all trips were made by cycling and walking (2019)

HOUSING AND AMENITIES

UBC is building a vibrant community by providing campus housing options to students, faculty, staff and other campus residents, and by developing recreation facilities, community centres, parks, and open spaces within our neighbourhoods and academic spaces.



UBC Vancouver

The UBC Vancouver campus now provides 841 faculty and staff rental units, and has expanded student residences to 12,425 beds.

HOUSING ACTION PLAN ADDS 405 NEIGHBOURHOOD RENTAL UNITS » UBC’s Housing Action Plan, updated in 2018 and endorsed by the UBC Board of Governors, 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 elements of the plan to improve 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 now make up 33% of all neighbourhood housing, with 405 new rental units added this year
- Faculty and Staff rental units now make up 39% of all rental units, including 156 of the 405 new units added

CHILD CARE EXPANSION PLAN REACHES 1,000 SPACES » As of January 2021, we increased inventory to 763 child care spaces and 237 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

COMPLETION OF SKEENA AND NECHAKO RESIDENCES ADDS 440 NEW BEDS » The 2020 completion of the Skeena Residence and upcoming completion of the Nechako Residence and Commons Block will increase student housing by 440 beds to just over 2,100 beds, offering 24-hour services and providing a 450-seat dining hall.

The renovations completed to UBC Okanagan’s existing childcare facility added 20 new spaces in 2020.

VANCOUVER

1,000

child care and out of school spaces in operation

VANCOUVER

400

new student beds at Pacific Residences ready for 2021

OKANAGAN

440

additional student beds ready for 2021

OKANAGAN

56%

increase in childcare space in 2020

WELLBEING

UBC Wellbeing is a collaborative effort to make the University a better place to live, work and learn. COVID-19 and the shift to virtual classrooms and offices this year reinforced our belief that good health and wellbeing for people and the planet are the foundation of our success as individuals, a university, and a community.



UBC Vancouver and Okanagan

THRIVE MENTAL HEALTH MOVES ONLINE » Thrive went virtual to ensure our community had supports to build mental health literacy while living, learning and working from home. New resources included Intersectional Approaches to Mental Health - A Facilitator's Guide - an intersectional approach to supporting mental health literacy and inclusion and diversity.

PROMOTING FOOD SECURITY IN HIGHER EDUCATION CONFERENCE » To increase opportunities for the campus community to explore local food environments and build community-wide food security, over 700 students, staff, faculty, and community members attended 12 events organized in partnership with UBC Meal Exchange, University of Guelph, McMaster University, University of Ottawa.

UBC MEAL SHARE PROGRAM PILOT » The Food Security Initiative (FSI) launched a UBC Meal Share pilot with the support of donors to the Student Wellbeing Fund. 96 students were provided funds to purchase food via their UBC card, ensuring low barrier and discrete access. Next year the program will be rolled out at both main campuses.

UBC RECREATION INCREASES ACCESSIBILITY AND INCLUSIVITY » New initiatives included Move U Crew-led Instagram movement breaks with 26,500+ views, Sports Week with 600+ participants, and a new Inclusive Physical Activity Toolkit.

Multisolving for people and the planet

Society faces complex interconnected issues including COVID-19 pandemic, the climate emergency, and the renewed urgency to advance Indigenous peoples' human rights and address systemic racism.

To tackle these challenges together -this year our wellbeing efforts were approached through a multisolving lens - guided by the principles of incorporating diverse perspectives, experiences and knowledge, resources and initiatives.

Specifically, we launched the "Inclusive Physical Activity Toolkit", "Intersectional Approaches to Mental Health - A Facilitator's Guide", and "Collective Lift" an equity and diversity focused workplace wellbeing action plan.

In addition, UBC co-hosted "Leveraging the Charter", an international event with over 250 participants that aimed to strengthen understanding of the Okanagan Charter, facilitate dialogue among higher education institutions, and use a multisolving framework to explore a number of interconnected challenges amplified by the pandemic.

"Multisolving is a strong tool that allows us to tackle complex problems. It also encourages this work to benefit vulnerable or marginalized groups, not just those already well off."- Karen Selby, Planning & Evaluation Advisor at UBC Wellbeing.

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>

VANCOUVER

29%

reduction in absolute GHG emissions since 2007

YEAR 2020-21	TARGET 67% reduction	TREND Increasing
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OKANAGAN

41%

reduction in absolute GHG emissions since 2013

YEAR 2020-21	TARGET 33% reduction	TREND Decreasing
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VANCOUVER

43,628

total GHG emissions (tCO₂e)

TARGET 20,359	TREND Increasing
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OKANAGAN

2,151

total GHG emissions (tCO₂e)

TARGET 2,434	TREND Decreasing
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OKANAGAN

36%

reduction in water use intensity per student since 2013

TARGET 29% reduction	TREND Decreasing
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VANCOUVER

1.9 m³

litres of absolute water use on campus

YEAR 2020-21	TARGET 2.4 m ³ or less	TREND Decreasing
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VANCOUVER

1,000

childcare spaces available

YEAR 2020-21	TARGET 1,200 by 2041	TREND Increasing
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THE UNIVERSITY OF BRITISH COLUMBIA

sustainability

