

CAMPUS AS A LIVING LAB | A UBC SUSTAINABILITY JOURNEY



“The Campus as a Living Lab at UBC is a testament to innovation and collaboration. We’re not just envisioning the future of sustainability; we’re creating it on our campus.”

– John Metras, Associate Vice-President, Facilities, UBC

INTRODUCTION TO CAMPUS AS A LIVING LAB (CLL)

CAMPUS AS A LIVING LAB CONCEPT





The “Living Lab” concept encapsulates an innovative approach to real-world problem-solving and innovation. They are places and spaces where people can design, pilot, study, and learn from social and technical innovations in real-time, real-world contexts. Living Labs serve as a bridge between theoretical research and practical application by fostering an environment of diverse participation through co-creation and co-development, and enabling participants to engage with complex problems and learn valuable lessons from both successes and failures.

Building on the foundational principles of Living Labs, “Campus as a Living Lab” (CLL) integrates the operations, infrastructure and academic capacity of a university to advance research, learning and sustainability initiatives. CLLs leverage the unique resources of a university to address sustainability challenges through the exploration and application of innovations, using its campus as a vibrant and dynamic learning laboratory.

GLOBAL CLL PERSPECTIVE

Campus as a Living Lab initiatives set up insitutional systems and structures on university campuses to support interdisciplinary collaborations and projects. These initiatives vary in how they are organized, funded, governed and managed, depending on each university’s needs and goals.

Campus as a Living Lab Global Examples:

- [Harvard Climate Solutions Living Lab](#) 
- [MIT Living Labs](#) 
- [UofT Campus as a Living Lab](#) 
- [European Network of Living Labs \(ENoLL\)](#) 

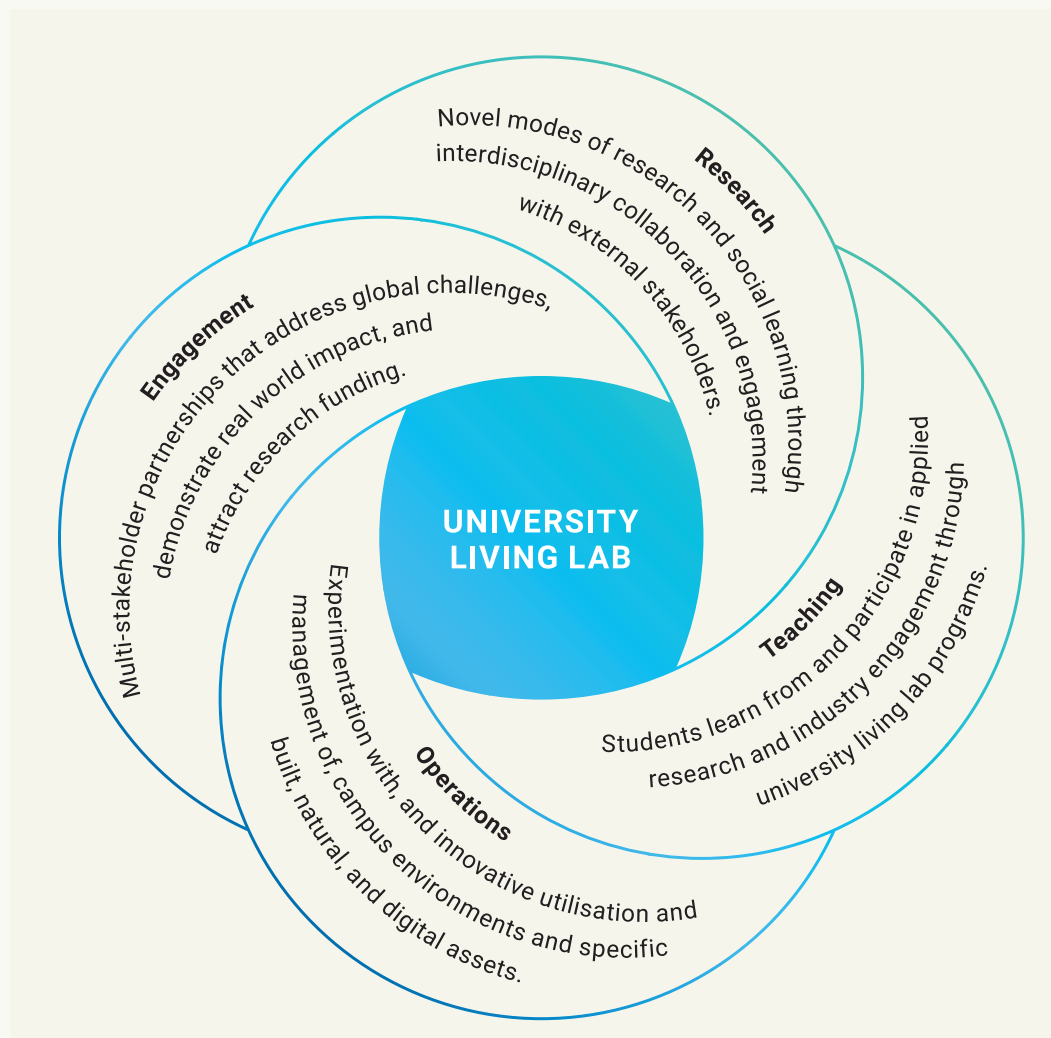
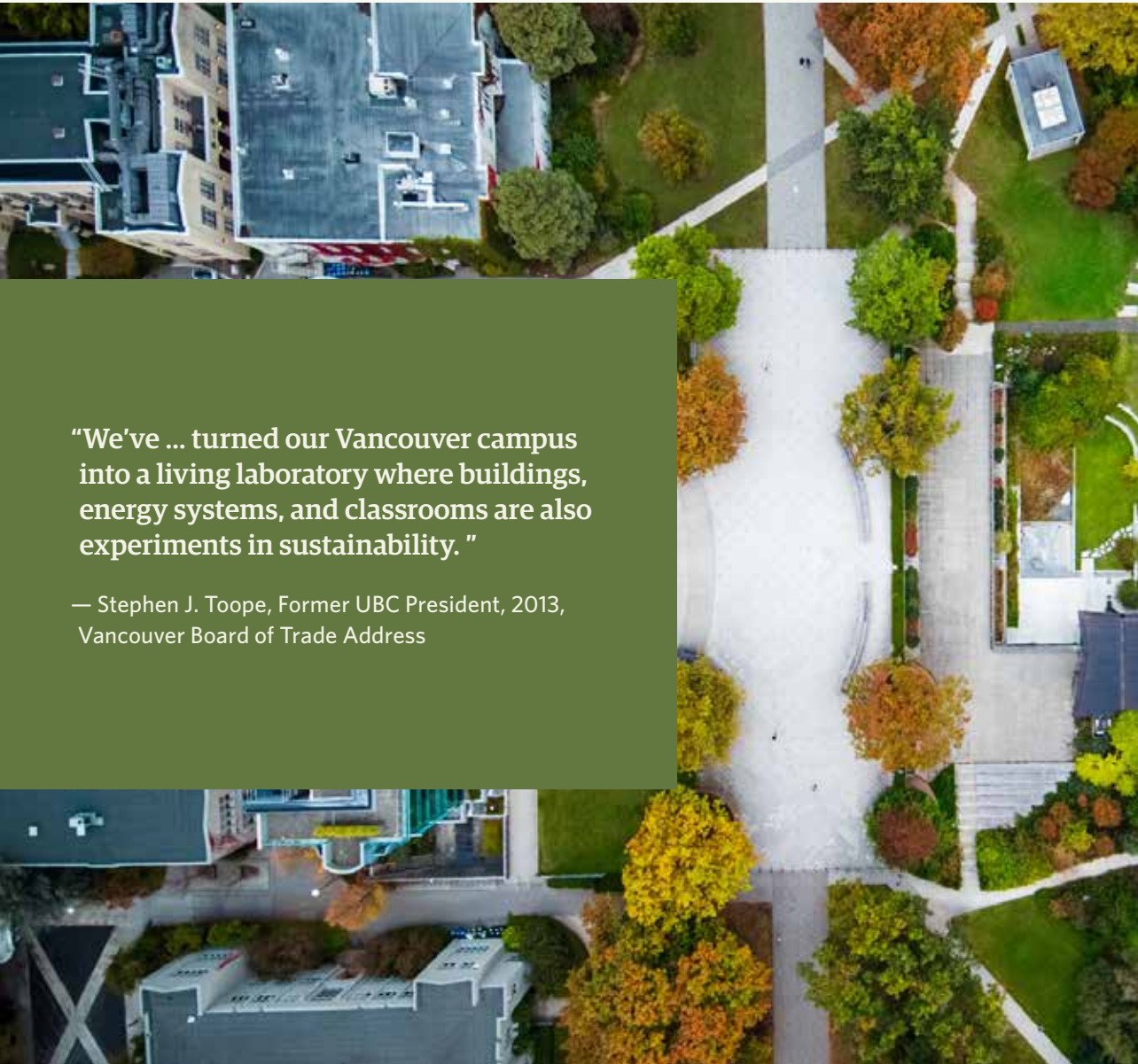


Figure: “Governing University Living Labs for Sustainable Development” Hadfield, Paris, et al. (2023). Pg 3 Fig.1



"We've ... turned our Vancouver campus into a living laboratory where buildings, energy systems, and classrooms are also experiments in sustainability."

— Stephen J. Toope, Former UBC President, 2013, Vancouver Board of Trade Address

UBC's CLL provides a collaborative framework for faculty, staff, students, and partners to address urgent global sustainability challenges, grounded in the local contexts and conditions of the university's campuses.

The concept initiated in the mid-2000s, originating from an understanding that as a public university, UBC has a dual responsibility to:

- explore and advance the various dimensions of sustainability through interdisciplinary research, teaching, and learning, and
- exemplify sustainable innovation and best practices in its operations and related activities both on and off campus.

Since then, a diverse portfolio of living lab projects have positioned UBC as a global leader, illustrating the potential of campus as a vibrant experimental ground for innovation and empowering the UBC community to create and test novel solutions through collaboration and knowledge sharing.

THE EVOLUTION OF CAMPUS AS A LIVING LAB AT UBC

● SUSTAINABILITY JOURNEY AT UBC

● LIVING LAB EVOLUTION AT UBC



UBC has been a leader in sustainability since the 1990s, working to create the most sustainable and equitable campuses in the world, and educating and empowering the leaders of tomorrow. UBC's CLL is a crucial part of the university's strategic plans and institutional priorities, as well as a means to showcase UBC's pivotal role in tackling significant societal and environmental challenges. The plans listed (right) emphasize UBC's role as a change agent for global sustainability challenges with specific reference to CLL as a means to address these challenges.



“UBC’s Campus as a Living Laboratory programs are driven by the University’s operational and sustainability commitments, and have a well-established track record of success to develop, pilot and scale innovative processes and solutions.”

- UBC Climate Action Plan 2030, 2021

Strategic Plans	Campus	Date Published	Support for CLL
Campus Vision 2050	Vancouver	2023	CLL as a collaborative framework for addressing global sustainability challenges
Climate Emergency Task Force Report (CETF) 2021	Vancouver/ Okanagan	2021	CLL supports work beyond UBC campuses with a focus on climate action
Climate Action Plan 2030	Vancouver/ Okanagan	2021	Leverages CLL for climate-informed teaching, learning, and research; promotes innovation in low carbon solutions and sustainable practices
UBC Strategic Plan 2018-2028	Vancouver/ Okanagan	2018	CLL highlighted in sustainability and thriving communities' strategies
UBC's Sustainability Academic Strategy	Vancouver/ Okanagan	2009	Integration of CLL in sustainability initiatives, research, and partnerships

CAMPUS AS A LIVING LAB GOVERNANCE

“UBC will continue to leverage its intellectual and institutional capacities to help address sustainability challenges across our campuses, as well as at the regional and global scale.”

- Santa Ono, Former UBC President, 2022,
UBC News



PURPOSE

As a leading public research university, we have a commitment and responsibility to leverage our academic and operational capabilities to respond to global problems through our local context.

MISSION

We provide a collaborative framework for researchers, students, operations staff and external partners to leverage the campus to explore, develop and test new ideas, and to share the knowledge gained from these experiences.

VISION

We aspire to be a globally-impactful hub for living lab research, demonstration, learning and knowledge exchange that helps address the world’s most urgent sustainability challenges.

GOVERNANCE

At both the Vancouver and Okanagan campuses, the UBC-CLL is overseen by interdisciplinary Steering Committees composed of leadership and representatives from academic faculties and operational units. These committees provide strategic oversight and guidance, advocate for program opportunities on and off campus and connect CLL with UBC’s priorities and plans.

UBC’s Sustainability Hub orchestrates and manages CLL initiatives, coordinating with other academic and operational units and championing UBC’s sustainability leadership.

From 2020-2022, UBC’s CLL underwent a strategic revision to better respond to current challenges and strengthen alignment with broader university sustainability, climate, and equity and inclusion goals. This culminated in a renewal of the purpose, mission, vision, and values for CLL and the role of the Steering Committees, as well as the establishment of the aligned but parallel paths at UBC Vancouver and UBC Okanagan.

CORE VALUES

- **Sustainability:** We support and develop projects that contribute to ecological, social and economic sustainability, address the climate and biodiversity crises, and are aligned with the long-term strategic vision for the UBC campuses and communities.
- **Equity & Inclusion:** We embed justice, equity, diversity and inclusion in all our projects and in our engagement with UBC community members and external partners.
- **Transparency:** We build collaborations and partnerships through clear and open processes, and ensuring fair, ethical, consensual and transparent engagement.
- **Collaborative Learning:** We embrace participatory and reciprocal ways of learning and sharing knowledge, reflective of the different communities, knowledge systems and experiences of those engaged in our projects.

CLL CAPITAL PROJECTS

Campus as a Living Lab has served as a framework to advance sustainable development in the physical landscape of campus. UBC's CLL capital projects demonstrate innovation in their design, construction, and operations, while integrating research, teaching, and learning programs to create impactful, sustainable buildings. These projects have influenced and informed policy and practice beyond campus and inspired a generation of sustainability leaders.



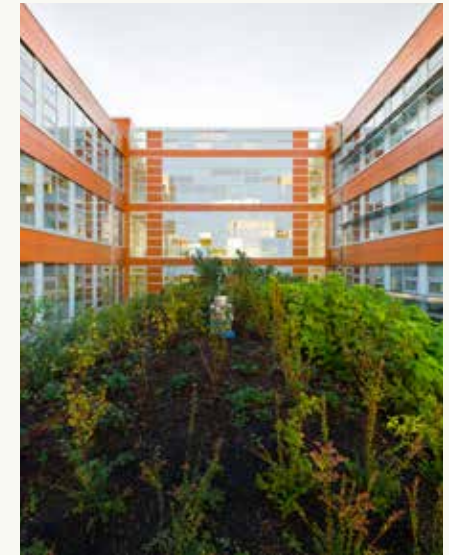
Brock Commons Tallwood Student Residence

Brock Commons is an 18-story student residence with a hybrid mass timber structure — the tallest contemporary wood building in the world when it was completed in 2017. It not only provides essential housing but also supports ongoing research into sustainable design and construction practices and building performance. Beyond UBC, the project has also served as a model for significant regulatory changes in the use of mass timber as a strategy to respond to both the housing crisis and climate change.



The Bioenergy Research and Demonstration Facility (BRDF)

BRDF has been an integral part of campus energy systems since 2012, converting wood waste into renewable thermal energy for heating campus buildings. This project significantly reduces UBC's carbon footprint and demonstrates the feasibility of small-scale, renewable energy generation from biomass. An onsite research lab, the Biorefining Research and Innovation Centre, propels interdisciplinary research on bioenergy, biofuels and bioproduct development using BRDF's systems.



The Centre for Interactive Research on Sustainability (CIRS)

CIRS is an interdisciplinary academic building, completed in 2011, that was a key driver in the establishment of UBC's CLL. The building incorporated multiple innovative sustainable design strategies and embodied the idea of integrating academic research opportunities into campus development and operations. A major demonstration of UBC's leadership, today it remains an interdisciplinary sustainability hub where students, faculty, staff and community members engage with UBC's commitment to a sustainable future.

CLL DIVERSE FORMS OF INNOVATION AND COLLABORATION

The concept of a Campus as a Living Lab (CLL) at UBC is fluid and adaptable, particularly in terms of knowledge mobilization and the realization of impact. It manifests in various formats, each uniquely contributing to the ecosystem of innovation and sustainability on campus.

Collectively, these initiatives under UBC's CLL approach demonstrate a holistic and dynamic method of embedding sustainability into the university's ethos. By weaving together innovative research, strategic partnerships, and community engagement, UBC's CLL is at the forefront of advancing sustainability in higher education and across society.



Smart Hydrogen Energy District (SHED) by MéridaLabs

SHED demonstrates the integration of research and city-scale infrastructure. It is a renewable energy hub that connects clean energy systems, transportation, information and communications technology and urban design, including a pilot of British Columbia's first hydrogen refueling and charging station.



UBC-Rogers Partnership

The UBC-Rogers partnership illustrates how universities and industry can collaborate on innovative research by leveraging campus infrastructure. The deployment of 5G technology across the campus has enabled multi-disciplinary projects with applications ranging from climate and mining to mobility and medicine. With access to new communications capabilities, UBC researchers can tackle greater challenges.



Centre for Sustainable Food Systems (CSFS) at UBC Farm

The UBC Farm is one of UBC's oldest living labs, developing collaborative research and teaching on sustainable food systems, ecologies and practices. The CSFS's mission is to design, facilitate and model food systems change through innovative research, place-based learning, knowledge mobilization, community building and stewardship of the UBC Farm.

CLL ANNUAL FUND COMPETITION

The UBC's CLL Annual Fund Competition was created to catalyze living lab projects and new interdisciplinary collaborations. It awards seed funding to projects that pilot innovative approaches to sustainability challenges, advance academic research and learning, improve university operations on campus and have the potential for impact beyond campus.

Since 2020, UBC Vancouver has funded 17 CLL projects. Since 2022, UBC Okanagan has funded four projects.

In 2023, UBC adapted the annual fund competition into a one-time CLL Grand Challenge competition to respond to the climate emergency, funding three projects at both campuses.



Bioenergy from commercial-municipal organic waste

UBC Vancouver: Chemical and Biological Engineering and Energy & Water Services

This innovative project explores the potential for utilizing aerobically treated organic waste from municipal green bin programs as a sustainable biomass source for UBC's BRDF. It addresses the dual challenges of waste reduction and renewable energy production, investigating a circular economy solution to reduce UBC's GHG emissions and improve operational resiliency.



Resilience hubs for UBC campus communities

UBC Vancouver: School of Community and Regional Planning and Safety & Risk Services

This visionary project enhances campus resilience in response to climate hazards, aligning with the Campus Vision 2050 Plan and working with local community organizations and the Musqueam. It will develop a resilience hub framework to strengthen community connections and regional emergency support, and create a disaster risk reduction roadmap for UBC's response to climate emergencies.



Smart fire detection systems to improve wildfire resilience of UBCO

UBC Okanagan: School of Engineering and Facilities Management

This pioneering project pilots an integrated wildfire-detection system using multi-sensor networks and hotspot risk assessment. It will build and test a digital dashboard to forecast wildfire threats and inform effective mitigation strategies in the region, thus significantly boosting UBCO's wildfire preparedness and response to climate risks.

**CAMPUS AS A LIVING LAB (CLL) IS
MANAGED BY UBC SUSTAINABILITY HUB**

For more information about CLL, please visit:

livinglabs.ubc.ca 

For CLL research, collaboration and partnership enquiries, please contact:

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UBC SUSTAINABILITY HUB

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“ In order to become a catalyst for change in society, a university must promote active dialogue and exchanges of information and ideas and assume the role of collaborator and co-learner with the larger community. This means creating meaningful partnerships for new forms of research, education and service. ”

– UBC SUSTAINABLE ACADEMIC STRATEGY, 2009

APRIL 2024

The UBC Sustainability Hub team in collaboration with our partners at both the Vancouver and Okanagan campuses, respectfully acknowledge that UBC’s campuses are situated within the traditional territories of the x^wməθk^wəyəm (Musqueam), Sk^wx^wú7mesh (Squamish), səlilwətał (Tsleil-Waututh) and in the traditional, ancestral, unceded territory of the Syilx (Okanagan) Nation and their peoples.



THE UNIVERSITY OF BRITISH COLUMBIA
Sustainability