

SUSTAINABILITY WALK

a walking tour of UBC
Vancouver, BC, Canada



Sustainability is in the **DETAILS** at UBC.

Above left, tiny mirrors in the solar canopy at the Biological Sciences Building light interior fixtures. Moving clockwise, cross-laminated timber features prominently in the Earth Systems Science Building. Photovoltaic panels at CIRS convert sunlight into electricity. The gravel trench at the C.K. Choi Building cleanses wastewater naturally.

On the cover, trees are reflected in the windows of the Fred Kaiser Building, which feature a heat-repellant ceramic coating.

Learn more about UBC's sustainability efforts at www.sustain.ubc.ca

Connect with the Centre for Interactive Research on Sustainability at www.cirs.ubc.ca

Explore UTown@UBC at www.planning.ubc.ca

Request guided tours of UBC green buildings online at www.sustain.ubc.ca/tours



September 2011



a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA



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“SUSTAINABILITY IS A HUMAN VALUE that is inextricably and dynamically linked to natural systems. When it comes to sustainability, everything—and everyone—is included.”

*Professor Stephen Toope, President and Vice-Chancellor,
The University of British Columbia*

UBC has long been at the FOREFRONT OF SUSTAINABILITY.

In 1997, we were the first university in Canada to make a formal commitment to sustainability and, a year later, to open a campus sustainability office.

UBC professors and students have launched scores of sustainability initiatives including establishing the carbon offset company used by the Vancouver 2010 Olympic Winter Games, originating the concept of an ecological footprint, and opening the Centre for Interactive Research on Sustainability (CIRS).

It is through our collective efforts in education, research, partnerships, and operations that the UBC Sustainability Initiative advances sustainability on the Vancouver campus and beyond. Our goal is to *commit, integrate, demonstrate* and *inspire*.

COMMIT UBC supports a more sustainable future by advancing sustainability debates, technologies, instruction and discoveries. In 2007, we met our Kyoto targets for reducing greenhouse gas (GHG) emissions and, in 2010, set some of the most aggressive GHG-reduction targets among the world’s top 40 universities.

INTEGRATE UBC reaches across traditional boundaries of disciplines, sectors and geographies to establish partnerships and collaborations. We invite participants from across the academic and operational areas of the University as well as the larger community to join the conversation.

DEMONSTRATE We’re using the entire UBC campus as a living laboratory to test, learn, teach, apply and share the outcomes of our inquiries. UBC is investing \$150 million in four climate goal-related projects: continuous optimization, hot water conversion, the Bioenergy Demonstration and Research Project and CIRS.

INSPIRE UBC is creating opportunities for learning that inspire our community of students, faculty, staff, alumni and partners. For example, we are establishing “learning pathways” that allow any student, regardless of their degree program, to include sustainability in their studies.

UBC is the **FIRST CANADIAN UNIVERSITY** to achieve a STARS Gold rating through the Association for the Advancement of Sustainability in Higher Education’s Sustainability Tracking, Assessment & Rating System.

SUSTAINABILITY ...by the numbers

33%

UBC’s target for reducing greenhouse gas emissions (from 2007 levels) by 2015. Further targets are 67 per cent by 2020 and 100 per cent by 2050.

350+

Sustainability-related courses offered by UBC.

25

Sustainability-related UBC degree programs.

500

SEEDS projects that have brought together students, faculty, and staff to contribute to operational sustainability.

125

Tonnes of waste UBC Food Services avoided producing in 2010 through composting and the use of biodegradable products.

2,000+

UBC students engaged in community-based experiential learning in BC communities, including Vancouver’s Downtown Eastside in the 2009-2010 academic year.

BUILDING FOR A SUSTAINABLE FUTURE

THE CENTRE FOR INTERACTIVE RESEARCH ON SUSTAINABILITY (CIRS) brings together extraordinary architecture and regenerative features under one roof. Here, UBC faculty, staff, students and partners work collaboratively to explore new sustainability technologies, tools and approaches. Lessons learned at CIRS will be applied on campus and, ultimately, in the local and global marketplace.

You are welcome to step inside the main doors of CIRS and, using this map as your reference, visit the public areas of the building.

Solar Energy

Converted from the sun through solar collectors and photovoltaic panels. Sunlight supplies approximately ten per cent of the building's demand for electricity and about sixty per cent of the demand for hot water heating.

Living Wall

Provides cooling through shade during the summer and allows warmth from the sun's rays to be absorbed by the building in winter. This vegetated wall of vines is three stories tall, and uses rainwater for irrigation.

Wood Building

Demonstrates wood as a viable construction material for commercial buildings. CIRS uses both pine beetle-damaged and certified wood throughout. Wood locks in carbon and eliminates GHG emissions that would have resulted from using other materials such as concrete and steel.

The Loop Café

Serves fresh, distinctive and organic choices that reflect local flavours. There is no disposable packaging on site, which minimizes carbon and environmental footprints.

Geothermal Heating and Cooling

Transfers thermal energy between the building and the ground depending on the season, using a geo-exchange system.

Rainwater Harvesting System

Catches rain from the rooftops and carries it to subterranean tanks where it's purified using filtration and disinfection. The drinking-quality water produced at CIRS will satisfy 100 per cent of the demand for potable water.

Lighting

Uses daylight to reduce the demand for electric lighting with dimming and occupancy sensors. All horizontal work surfaces are lit by natural sources, allowing occupants to interplay and adapt as light changes.

Green Roof

Provides a meadow environment for birds, insects and native plants, and contributes to reducing urban heat island effects.

Lecture Hall

Uses daylight as its major lighting source. This 450-seat auditorium features state-of-the-art audiovisual facilities and serves as a classroom for undergraduate courses.

Waste Energy System

Reclaims energy previously released into the air from nearby Earth and Ocean Sciences building (EOS). Waste energy satisfies 100 per cent of the demand for space heating in CIRS. Surplus heat is returned to EOS, reducing UBC's GHG emissions and use of natural gas.

BC Hydro Theatre

Features advanced visualization and interaction technologies to engage audiences in simulations of sustainability scenarios. Groups "fly" to different locations, visualize a region now and in the future, and manipulate information using wireless devices connected to large visual display screens to consider the potential impacts of climate change, energy use and sustainability.

Wastewater Treatment System

Treats and recycles wastewater from CIRS and campus buildings for continual use. Cleansing process uses solar aquatics and constructed wetlands. Reclaimed water is used for flushing toilets and for irrigation.



SUSTAINABLE CAMPUS WALKING TOUR

TIME NEEDED: 60 to 90 minutes DISTANCE: 2.5 kilometres

UBC'S SUSTAINABILITY EFFORTS, EXPERIMENTS AND ACCOMPLISHMENTS can be seen in every corner of UBC's Vancouver campus. From the sustainability features we incorporate in our buildings to the sustainability information we share through courses and research, the University aims to inspire our community of 50,000 students, faculty and staff to make sustainability part of their daily lives.

Many of our ideas for sustainable learning, working and living were conceived—and are reflected—in the buildings on campus. We encourage you to take a peek inside our buildings during regular office hours, but please do so quietly—the UBC community is hard at work!

UBC IS COMMITTED TO ENSURING ALL NEW BUILDINGS ARE CERTIFIED LEED® GOLD OR BETTER. The LEED Green Building Rating System® accelerates the global adoption of sustainable green building and development practices. At present, 10 campus buildings are LEED registered (Platinum, Gold and Silver) and two are LEED Gold certified.

1 C.K. CHOI BUILDING

1855 West Mall

The **C.K. Choi Building for The Institute of Asian Research** set new green building benchmarks worldwide when it opened in 1996. As UBC's first green building, it uses about 23 per cent less energy than a standard building, thanks in part to its large windows that let in natural light and fresh air for ventilation. Fifty per cent of its building materials came from former buildings and streets, including the 400-year-old red bricks and the wood beams from UBC's old Armoury. The building's composting toilets save 1,000 litres of water per day, and the plant-lined gravel trench along the front of the building cleanses wastewater naturally.

> Walking north along West Mall to Crescent Road, you'll see the **Liu Centre for Global Issues** that, like the C. K. Choi Building, features windows that maximize daylight. If time permits, visit the building's entry courtyard to view the rare, large-specimen Katsura tree around which the building was sited. Turn right on Crescent Road and walk to the **Flag Pole Plaza**. Take in the spectacular views, then walk south on Main Mall.

The next three stops showcase buildings renovated through the UBC RENEW PROGRAM, which upgrades buildings that would otherwise be replaced, and makes them more sustainable. UBC Renew minimizes the financial and environmental impacts of demolition and new construction and preserves heritage buildings.

2 BUCHANAN COMPLEX

1866 Main Mall

The **Buchanan Complex** was originally built in the 1950s and recently underwent a major renovation. The complex's renovation budget was just 67 per cent of the cost of a new building, and 70 per cent less materials were used during construction. LEED certification (Silver or Gold) is pending.

> Continue south along the Main Mall's wide-open road, designed for walking and cycling, and take note of the inviting public spaces in front of the **Irving K. Barber Centre** (with the historic Main Library core maintained) on your left, and the **Koerner Library** on your right. Please excuse any inconvenience caused by our ongoing construction efforts to make UBC even more pedestrian and cyclist friendly.

3 CHEMISTRY CENTRE

2036 Main Mall

The **Chemistry Centre**, a heritage building, now boasts state-of-the-art open concept labs and upgraded lecture theatres with advanced audiovisual capabilities. The choice to renovate—rather than demolish and build—kept 313 tonnes of waste out of the landfill, and saved five million litres of water that would've been needed to manufacture new materials and construct a new building. High-efficiency lighting and a heat recovery system reduce energy use by 21 per cent annually.

> Continue walking south along Main Mall, past the intersection with University Boulevard.

4 BIOLOGICAL SCIENCES BUILDING

6270 University Boulevard

Walk the length of the recently renovated **Biological Sciences Building** and turn left to see the tiny mirrors on the building's south side. They're part of a "solar canopy" which collects ambient sunlight, concentrates it into a light beam 10 times brighter, then pipes it through a window to interior ceiling fixtures providing overhead lighting.

> Walk south on Main Mall.

5 AQUATIC ECOSYSTEMS RESEARCH LABORATORY (AERL)

2202 Main Mall

AERL houses many lab facilities, including an Immersion Lab for modeling complex ecosystem behaviour. Natural daylight enters through the building atrium and into all the office and lab spaces. The amount of potable water used for faucets and toilets is 40 per cent less than a standard building. AERL emits 40 per cent less greenhouse gas annually, compared to a standard building.

The green, grassy space beside AERL is the green roof of the **Beaty Biodiversity Museum**. The landscape is kept in its natural state to encourage biodiversity.

> Continuing on Main Mall you'll pass the **Earth Systems Science Building** on your right, featuring eco-savvy cross-laminated timber. On your left, you'll see the **Fred Kaiser Building for Electrical and Computer Engineering**, which has ceramic coating on the glass along the top floor, mimicking the natural shading of trees and keeping the building cool in warm weather.

★ YOUR CHOICE...

> To visit the **Life Sciences Centre**, continue on Main Mall to Agronomy Road and turn left.

> To shorten the tour, turn right at the **Fred Kaiser Building** and walk down "Stores Road" (renamed **Sustainability Street**) to Stop #7.

6 LIFE SCIENCES CENTRE

2350 Health Sciences Mall

Completed in 2004, the **Life Sciences Centre (LSC)** is the largest laboratory building in Canada to achieve LEED Gold certification. The LSC uses up to 40 per cent less energy and 50 per cent less water annually than a conventional laboratory building. The building's two atria are at the core of its environmental and social success—they allow daylight to enter lab spaces, play a key role in the building's natural ventilation system, and provide comfortable gathering spaces.

> Retrace your steps along Agronomy Road. When you cross Main Mall, look left. In the distance you'll see **Hawthorn Place** and the **Old Barn Community Centre**, part of **UTown@UBC**, which is transforming UBC from a commuter campus into a vibrant, complete community where students, faculty, staff and others can live, work and learn.

> Turn right on Main Mall, left on Stores Road and continue to our last stop.

7 CENTRE FOR INTERACTIVE RESEARCH ON SUSTAINABILITY

2260 West Mall

The **Centre for Interactive Research on Sustainability (CIRS)** is designed to be the most innovative high-performance building in North America (see features described on overleaf). CIRS is a focal point for sustainability research and partnerships, teaching and learning, and operational activities—a research centre that addresses some of the world's most pressing sustainability challenges.

★ If you have time, visit **THE UBC FARM** (6182 South Campus Road via Wesbrook Mall), 24 hectares of integrated farm and forest lands on the south side of campus. The farm is managed by the Centre for Sustainable Food Systems, which offers interdisciplinary learning, research, and community programs that explore and exemplify new models for sustainable communities. The UBC Farm Market (Saturdays, late June to mid-October) offers 250 varieties of fruits and vegetables, eggs, honey and flowers grown on-site, and features craftspeople and live music. Many of UBC's food outlets use fresh produce from the UBC Farm.



Scheduled for completion in 2012, UBC'S BIOENERGY RESEARCH AND DEMONSTRATION PROJECT (2337 Lower Mall) will showcase the technical and commercial viability of a combined heat and electrical power bioenergy system. This clean energy project will generate enough steam energy to heat 25 per cent of the campus, and eliminate up to 4,500 tonnes of greenhouse gas emissions per year—that's equivalent to taking 1,150 cars off the road.

