



# SUSTAINABILITY

**GOAL 2: MAKE UBC A LIVING LABORATORY IN ENVIRONMENTAL AND SOCIAL SUSTAINABILITY BY INTEGRATING RESEARCH, LEARNING, OPERATIONS, AND INDUSTRIAL AND COMMUNITY PARTNERS**

## Objective: Make UBC a living laboratory in environmental and social sustainability

**Purpose:** As an internationally recognized leader in sustainability, UBC continues to advance the integration of academic and operational sustainability to leverage our unique position to transform our campuses into societal test-beds for advancing sustainable technologies and strategies, accelerating sustainable research innovations and furthering operational excellence. We collaborate with private, public, NGO and community partners to leverage operational, educational and research capabilities to study, teach, apply and share lessons learned which help to inform policies that are supportive of greater market transformation in sustainable technological development.

We perform research that provides insights and solutions to institutional challenges involved in achieving sustainability; we practice sustainability operationally at a scale of great interest to universities and cities around the world; and we prepare students as a future generation of sustainability leaders with knowledge, skills and abilities that can be applied in the advancement of their careers. Delivering on our commitment to the academic mission, we continue to embed sustainability across the curriculum, and provide numerous applied research and leadership opportunities that engage students, faculty and staff in researching solutions to sustainability challenges that are encountered within UBC and beyond.

**Definition:** The following metrics demonstrate the degree to which UBC is integrating research, learning, operations and industrial and community partners. Key metrics include: a) our performance in achieving our ambitious climate action targets and implementing our award-winning Climate Action Plan; b) the number of students, staff and faculty engaged in collaborative and applied sustainability research projects on campus; c) the number of sustainability courses and courses that include sustainability; and d) the number of faculty engaged in sustainability research.

### Overall Metrics<sup>1</sup>:

	Okanagan			Vancouver		
	2012/13	2013/14	2014/15	2012/13	2013/14	2014/15
<b>Greenhouse Gas (GHG) Emissions</b>						
<i>GHG Emissions (tCO2e)<sup>2</sup></i>	3,316	3,629	3,123	60,715	52,832	47,814
% change from 2007 baseline	+52%	+66%	+43% <sup>3</sup>	-0.6%	-14%	-22%
<i>GHG Emissions Per Student (tCO2e/FTE)<sup>4</sup></i>	0.45	0.49	0.43	1.42	1.21	1.08
% change from 2007 baseline	-16%	-8%	-20%	-13%	-26%	-34%
<b>Living Laboratory Projects</b>						
<i>SEEDS Participants (students, staff, faculty)</i>	-	-	-	495	890	-
<i>SEEDS Projects</i>	-	-	-	69	75	-
<i>SEEDS Research Reports</i>	-	-	-	113	180	-

	Okanagan			Vancouver		
	2012/13	2013/14	2014/15	2011/12	2013/14	2014/15
<b>Transforming Curriculum</b>						
<i>Total Sustainability-Oriented Courses</i>	114	119	124	385	509	636
<i>Sustainability Courses</i>	22	24	26	96	110	145
<i>Courses that include Sustainability</i>	92	95	98	289	399	491
<b>Sustainability Research (Vancouver only)</b>						
<i>Faculty Engaged in Sustainability Research</i>				-	-	448
<i>% of total faculty</i>				-	-	21.4%

<sup>1</sup> Most recent year of available data for each metric is reported.

<sup>2</sup> Tonnes of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e)

<sup>3</sup> 2007 baseline includes buildings emissions only. 2014 data represents emissions from all in-scope sources (buildings, fleet, paper, fugitive emissions) and represents a 90% increase in floor space and 81% increase in student enrolment since 2007.

<sup>4</sup> Full-time equivalent (FTE)

## Explanation of the Results and Next Steps

**Greenhouse Gas (GHG) Emissions:** Under the provincial Greenhouse Gas Reductions Target Act (Bill 44), UBC is required to submit a Carbon Neutral Action Report (CNAR) to the province each year on emissions and actions taken to reduce emissions. As required by provincial legislation, UBC has purchased offsets for its GHG emissions each year since 2010.

In 2010, UBC's Vancouver Campus Climate Action Plan committed to aggressive GHG emission reduction targets, aiming to reduce emissions 33 per cent by 2015, 67 per cent by 2020, and 100 per cent by 2050, compared to 2007 levels. Since 2007, Vancouver campus absolute GHG emissions have decreased by 22 per cent despite significant growth. Per capita, emissions have decreased 34 per cent per FTE student. UBC's Climate Action Plan projects (Continuous Optimization, Academic District Energy System steam to hot water conversion, and Bioenergy Research and Demonstration Facility) are forecasted to achieve the targeted 33 per cent emissions reduction compared to 2007 levels in 2016.

Despite an absolute increase in UBC's Okanagan campus GHG emissions due to growth in floor space and enrolment, in 2014 relative emissions decreased by 20 per cent per FTE student compared to 2007 levels. A campus geo-exchange district energy system, sustainable building design and continuous optimization of legacy facilities have contributed to greater efficiencies and performance.

**Next Steps:** UBC's Vancouver campus will continue to implement the core Climate Action Plan projects, including continued optimization of major campus buildings, completion of the 5-year steam to hot water conversion project and continued optimization of the Bioenergy Research and Demonstration Facility. In 2015, work will commence on updating UBC Vancouver's Climate Action Plan for 2015-2020 to identify additional actions and measures to advance towards its aggressive targets. UBC's Okanagan campus will continue to implement its building optimization and energy conservation programs in 2015, while engaging in whole systems planning for resource efficiency to support the Okanagan Campus Master Plan.

**Living Laboratory Projects:** Since 2000, UBC's SEEDS (Social Ecological Economic Development Studies) Sustainability Program has created collaborative partnerships between students, faculty, and staff on accredited sustainability projects that integrate operations and academia. SEEDS projects engage the Campus as a Living Lab, enabling applied and experiential learning opportunities for students while producing measurable results for campus operations and supporting the implementation of campus sustainability plans.

In 2013/14, the SEEDS Sustainability Program engaged 890 students, faculty and staff in applied and collaborative research, resulting in 75 projects and 180 student reports related to campus sustainability topics such as waste, procurement, materials, buildings, water, energy, transportation, climate, food systems, biodiversity, health and community. The outcomes

of the majority of projects are implemented or influence decision making around ecological, social and economic sustainability on campus. To date, over 1,000 student research reports have been published online in the SEEDS Library, accessible at <http://sustain.ubc.ca/seeds-library>.

**Next Steps:** The SEEDS Program will continue to engage students, staff, and faculty in applied campus sustainability research projects, diversifying and formalizing SEEDS experiential learning opportunities and partnerships with faculties, schools and operational departments across campus.

**Sustainability Courses:** This measure indicates the number of sustainability courses and courses that include sustainability, as per the definition in the Association for the Advancement of Sustainability in Higher Education's Sustainability Tracking, Assessment & Rating System (STARS). Updated definitions and methodology were used for 2014-15 so comparisons with previous years are not meaningful. Each year the complete and accurate identification of sustainability-oriented courses is improved. This year Okanagan courses were identified using the same methodology as the Vancouver campus. Faculty were consulted in Vancouver but not Okanagan due to time restraints. Results of the course review and the faculty consultation are compiled by the UBC Sustainability Initiative. Information for UBC's Vancouver campus is made available to students and the general public on the UBC Sustainability website (<http://sustain.ubc.ca/courses-teaching/courses>).

**Next Steps:** Identified sustainability-oriented courses provide a critical resource for faculty to build Sustainability Learning Pathways in their respective academic units. A Sustainability Learning Pathway is a collection of sustainability-oriented courses and experiences that students pursue alongside their disciplinary major. Making sustainability learning available to all UBC students via a Pathway is a key goal of the 20-year Sustainability Strategy for UBC's Vancouver campus. Pathways may be integrated within existing programs, or offered as a separate entity such as a minor. The methodology for identifying courses and consulting with faculty will continue to be improved on both campuses.

**Sustainability Research:** This measure indicates the number and percentage of faculty at UBC's Vancouver campus who conduct sustainability research. As per the definition in STARS, sustainability research is research that leads toward solutions that simultaneously support social wellbeing, economic prosperity, and ecological health. By conducting research into sustainability issues and by refining theories and concepts, higher education institutions help advance the understanding of sustainability challenges and contribute to the development of new processes, strategies and technologies that address those challenges. The total number of in-scope faculty (Professor, Associate Professor, Assistant Professor) at UBC's Vancouver campus in October 2014 was 2089. The total number of in-scope faculty members engaged in sustainability research was 448. This results in a percentage of 21.4%.

**Next Steps:** New and continued engagement opportunities (grants, fellowship programs, communications efforts) will encourage sustainability research. The expectation is that this will result in increased numbers of faculty engaged in sustainability research. The methodology used at Vancouver may also be applied to UBC's Okanagan campus.

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For more information on UBC's sustainability policies, plans, and reports, please refer to UBC Annual Sustainability Reports, available online at: <http://sustain.ubc.ca/our-commitment/strategic-plans-policies-reports/annual-reports>