



GREENHOUSE GAS EMISSIONS

	Okanagan ¹			Vancouver ²			UBC ¹		
	2007	2012	% Change from 2007	2007	2012	% Change from 2007	2007	2012	% Change from 2007
GHG Emissions (tCO ₂ e)	2,186	3,124	+43%	61,082	60,715	-0.6%	63,268	63,839	+0.9%
GHG Emissions (tCO ₂ e) / FTE student	0.53	0.42	-21%	1.62	1.42	-13%	1.52	1.27	-16%

¹ UBC's Okanagan campus reports on buildings emissions only for comparison to 2007 baseline. Data for fleet and procurement emissions are not available prior to 2010. Buildings accounted for 96 per cent of in-scope campus GHG emissions in 2012.

² UBC's Vancouver campus reports emissions for core and ancillary buildings, fleet, paper, and 1/11th of TRIUMF

Figure 1: GHG Emissions at UBC's Vancouver Campus 2007-2012, Compared to FTE Students and Floor Space

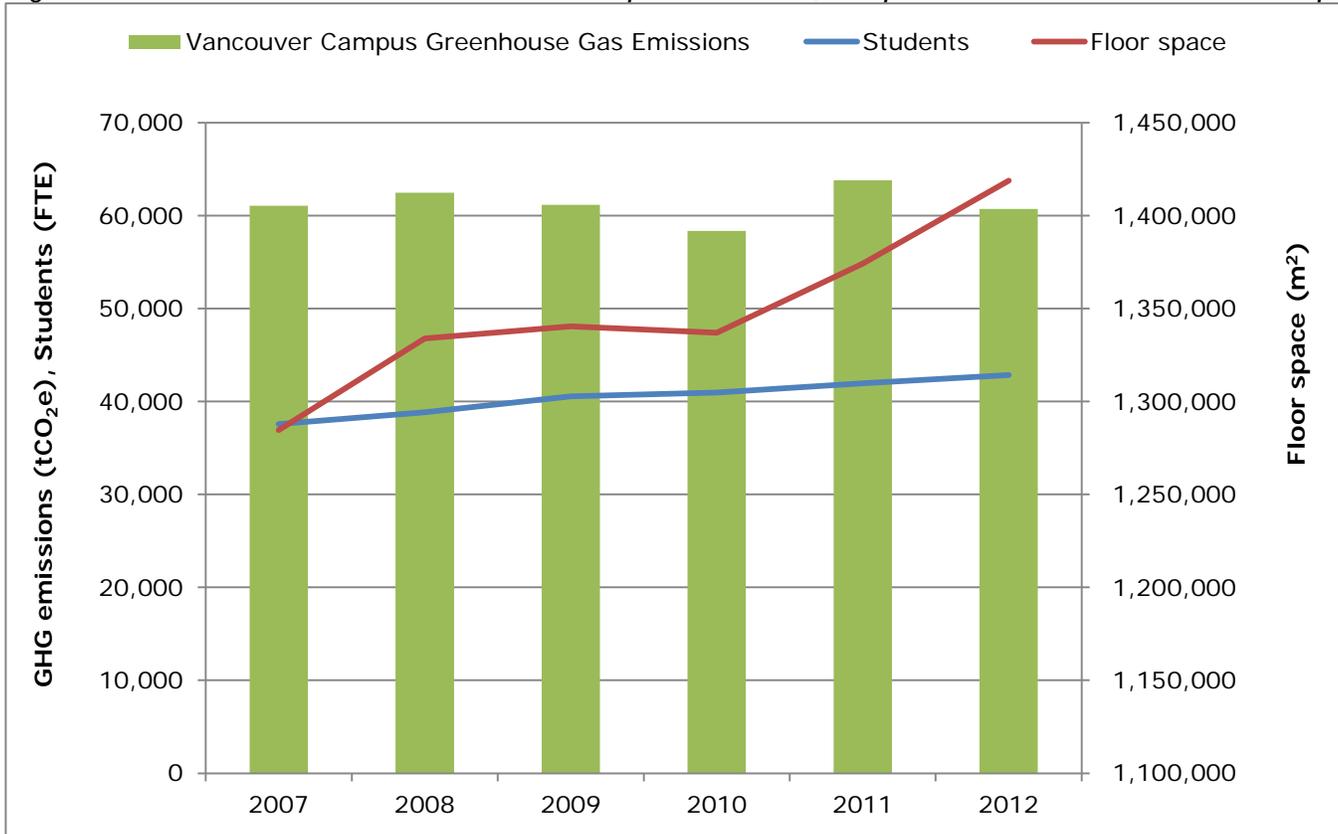
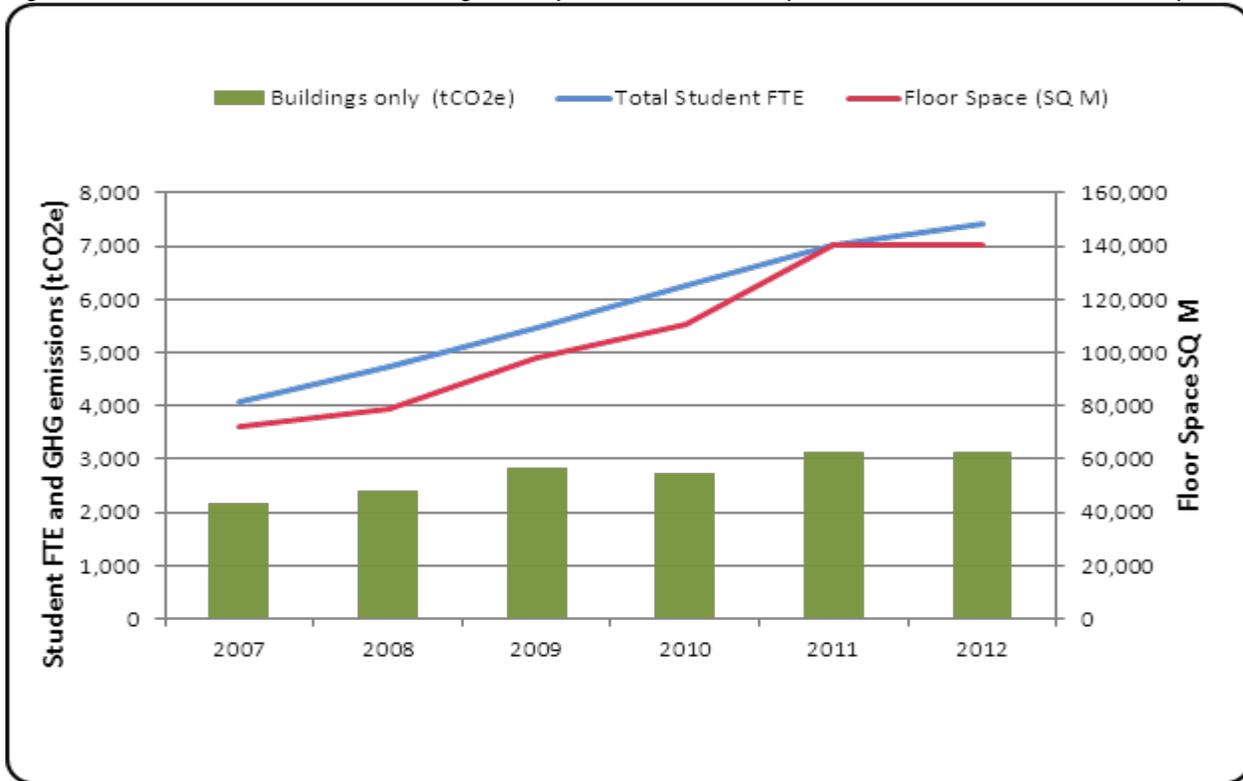


Figure 2: GHG Emissions at UBC's Okanagan Campus 2007-2012, Compared to FTE Students and Floor Space



Benchmark

Table 1: Comparison of Absolute GHG Emissions of Institutions of Comparable Size and Ranking, as Reported in STARS¹

Key Performance Indicator	University of British Columbia - Vancouver	McGill University ⁶	New York University ⁷	University of California – San Diego ⁸	University of Washington – Seattle ⁹
GHG Emissions (tonnes CO ₂ e) ²	60,715 ⁴	39,559	124,055	189,307	109,185
Degree-Seeking Students ³	49,372 ⁵	28,778	42,667	27,325	43,307

¹ Comparisons were calculated based on the most recent data reported in the Association for the Advancement of Sustainability in Higher Education (AASHE)'s Sustainability Tracking, Assessment & Rating System (STARS) reports as of November 2012. Institutions selected reported more than 25,000 degree-seeking students in STARS Credit ER-1 and ranked within the Top 40 of the 2012-13 Times Higher Education World University Rankings.

² GHG emissions for comparative institutions represent Scope 1 and 2 emissions as reported in STARS credits OP-5 for the respective performance year of each institution. STARS reports are publically available at <https://stars.aashe.org>.

³ Degree-seeking students is reported from respective institutions' data in STARS Credit ER-1 to illustrate the comparative size of student populations across institutions.

⁴ GHG emissions for UBC are from the 2012 GHG Inventory (Scope 1 & 2 and paper) at the Vancouver campus.

⁵ UBC degree seeking student enrolment data is derived from the Office of Planning and Institutional Research (PAIR) and includes UBC Vancouver 2012 Full-time/Part-time Registrants (headcount)

⁶ As per STARS report submitted Aug 1 2012

⁷ As per STARS report submitted Jan 31 2011

⁸ As per STARS report submitted May 18 2011

⁹ As per STARS report submitted Oct 17 2012



Description

This measure indicates the reduction of greenhouse gas (GHG) emissions per student (in tonnes of CO₂ equivalent per full-time equivalent student, or tCO₂e/FTE) at each campus and the total for the university, indicated as a percent change from the baseline year of 2007. GHG emissions are calculated for the calendar year (Jan 1st - Dec 31st).

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. These targets apply to emissions from core and ancillary buildings, TRIUMF, fleet and paper at the Vancouver campus.

Under the Greenhouse Gas Reductions Target Act, UBC is also 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. UBC’s Vancouver campus annual GHG Inventories, Carbon Neutral Action Reports, and Climate Action Plan Reports are available at <http://sustain.ubc.ca/campus-initiatives/climate-energy/climate-action-plan>. UBC Okanagan campus Carbon Neutral Action Reports and SHIFT Sustainability Reports are available at <http://www.ubc.ca/okanagan/sustainability/reports.html>.

Person with lead responsibility for this metric: Director, Operational Sustainability, UBC Vancouver;
Director, Sustainability Operations, UBC Okanagan

Data collection will be from: Campus Sustainability (Vancouver); Sustainability Office (Okanagan)

Date: Calendar Year (Jan 1st - December 31st)

Explanation of Results

Vancouver Campus

The emissions from Vancouver campus buildings along with fleet and paper amounted to 1.42 tCO₂e per full-time equivalent (FTE) student in 2012, a 13 per cent decrease in emissions per student since 2007. Table 2 below outlines the change in campus emissions since the 2007 baseline year, along with indicators of UBC Vancouver campus growth.

Table 2: UBC Vancouver Campus GHG Emissions Compared to 2007 Baseline

Key Performance Indicator	2007	2012	Change from 2007 to 2012
GHG Emissions (tonnes CO ₂ e) ¹	61,082	60,715	-0.6%
Staff and Faculty Employees (FTE) ²	12,045	13,206	+10%
Student Enrolment (FTE) ³	37,589	42,848	+14%
GHG Emissions per Student (tonnes CO ₂ e/FTE)	1.62	1.42	-13%
Floor Space (square meters) ⁴	1,284,592	1,418,833	+10%
GHG Emissions per square meter (tonnes CO ₂ e/m ²)	0.048	0.043	-10%

¹ GHG emissions include core and ancillary buildings, TRIUMF, fleet and paper for the UBC Vancouver Campus.

² Staff and Faculty FTE enrolment data is derived from the Office of Planning and Institutional Research (PAIR).

³ Student FTE enrolment data is derived from the Office of Planning and Institutional Research (PAIR).

⁴ A cademic floor space includes buildings owned by UBC only. Values are provided for core and ancillary building areas as tracked by Infrastructure Development



Vancouver campus emissions decreased 0.6 per cent from 2007 to 2012, despite a 10 per cent increase in building floor space and a 14 per cent increase in student enrolment. The emissions from campus buildings along with fleet and paper amounted to 1.42 tCO₂e per full-time equivalent student in 2012, a 13 per cent decrease in emissions per student since 2007.

UBC's Vancouver Campus building floor space increased by over 134,000 m² between 2007 and 2012, with several older buildings demolished to make way for construction of 26 new buildings. Notable new buildings that opened in 2012 include Pharmaceutical Sciences & Centre for Drug Research and Development, Earth Sciences Building, and the Bioenergy Research and Demonstration Facility.

The Bioenergy Research and Demonstration Facility (BRDF) officially opened in September 2012, contributing to the decrease in campus emissions. When the BRDF ramps up to full capacity in 2013, it will eliminate 9 per cent of campus GHG emissions. Emissions will continue to reduce as UBC's other major projects reach completion in 2015. The steam to hot water conversion will reduce emissions by 22 per cent and the Continuous Optimization "Building Tune-Up" program is retro-commissioning 72 buildings to reduce emissions in core buildings by 10 per cent.

More information about UBC's Vancouver Campus Climate Action Plan is available at <http://sustain.ubc.ca/campus-initiatives/climate-energy/climate-action-plan>.

Okanagan Campus

UBC's Okanagan campus stationary building emissions accounted for 3,124 tCO₂e in 2012. Between 2007 and 2012 energy consumption per square metre of building space dropped by 27 per cent despite an increase in building space of 95 per cent and student FTE increase of 81 per cent.

This significant achievement can be attributed to a focus on green building design, the closed loop geo-exchange district energy system and ongoing operational commissioning. The closed loop geo-exchange district energy system achieved full operation in 2012, with the integration of original academic buildings into the loop. Serving academic buildings on campus, the system transfers heating or cooling energy from an aquifer water loop into campus distribution piping on a separate closed loop and is a significant engineering achievement toward increased utilization of renewable energy on campus. The transfer of waste heat from the administration building data centre was enabled in 2012, and optimization is ongoing.

Recommended Action

By completing the major projects that are in progress (BRDF, Hot Water Conversion and Continuous Optimization), UBC's Vancouver campus will achieve its 2015 Climate Action Plan target of 33 per cent reduction.

Additional projects are required to achieve the 2020 Climate Action Plan target of 67 per cent reduction in the context of campus growth. Proposed projects include continuing the re-commissioning program (Continuous Optimization) and a heat pump project to move low-GHG waste heat from TRIUMF to the Academic District Energy System.