



Case Study: Climate Action in the Context of an Externally Imposed Price on Carbon

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UBC Vancouver Campus—Climate Action Plan 2020

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Synopsis [The University of British Columbia's Climate Action Plan 2020](#), in Vancouver, and Okanagan's [Whole Systems Infrastructure Plan](#) (energy and carbon actions) identify actions the university can take to meet climate targets and goals. These programs ensure our operations run responsibly and in compliance with British Columbia's provincial climate legislation, which applies externally an explicit price on carbon.

The University of British Columbia (UBC) is required to pay \$60 per metric tonne of carbon dioxide equivalent emitted (MTCDE). This figure combines a \$35/tonne carbon tax on the purchase of natural gas and a \$25/tonne tax for offsets from operational emissions, to meet public sector carbon neutrality.

The Provincial carbon tax affects the financial feasibility of UBC's climate actions in Vancouver and Okanagan. This case study is different from the others in this toolkit. It provides insight into a university's response to an *external* carbon price, rather than summarizing development of an *internal* carbon pricing approach.

Primary stakeholders involved UBC leadership, students, faculty, staff, and community members.

Key dates In 2010, UBC became the first university in Canada to announce greenhouse gas (GHG) reduction targets: 33% reduction in GHG emissions below 2007 levels by 2015, 67% by 2020, and 100% by 2050. The UBC Board of Governors approved the plan and the GHG targets in 2010.

Six years later, in 2016, UBC established the [Climate Action Plan 2020](#) (CAP 2020), a major update to its original plan that was approved by the UBC Board of Governors. The Plan outlines actions the university can take at the Vancouver campus to reduce GHG emissions by 67% from 2007 levels by 2020.

Scope The 2010 CAP and CAP 2020 apply only to the Vancouver Point Grey Campus of UBC, not including the residential areas within the University Neighbourhoods Association. The CAP 2020 scope includes:

- Scope 1 and 2¹ emissions for the Vancouver campus core academic and ancillary buildings, fleet, energy supply, and paper; emissions from buildings operated by UBC's developer, UBC Properties Trust
- Scope 3² covering commuting, business travel, building lifecycle, and solid waste.

1. Scope 1 emissions are direct emissions from fuel use on campus; Scope 2 emissions are indirect (due to energy use of campus—i.e., to produce electricity that is then supplied to UBC).

2. Scope 3 emissions are primarily off-campus emissions not included in UBC's GHG reduction targets and not offsettable under carbon neutral provincial regulations. However, they are estimated and reported as part of UBC's GHG inventory in the annual Carbon Neutral Action Reports.



Determining a carbon price The BC provincial government sets the price on carbon through two mechanisms:

1. The BC Carbon Tax, enacted in 2008, applies to the purchase and use of fossil fuels. As of April 1, 2018, BC's carbon tax rate increased from \$30 to \$35/MTCDE. The tax rate will increase by \$5 per tonne each year until it reaches \$50 per tonne in 2021.
2. The Carbon Neutral Government Regulation was enacted in 2010 in support of the Greenhouse Gas Reduction Targets Act. It requires public sector organizations to annually define, measure, report, verify, and offset in-scope GHG emissions; and to plan and implement internal actions to reduce GHG emissions and offset any remaining emissions. The carbon offset cost is currently \$25/tonne.

With the tax and regulation combined, UBC must pay \$60/MTCDE.

CAP 2020 development process UBC's 2010 Climate Action Plan reached its GHG reduction targets while reducing energy and operational costs. Under the plan, UBC Vancouver achieved 33% reduction in GHG emissions in 2016, despite a 16% increase in building floor space and a 23% increase in student enrolment.

UBC's Climate Action Plan 2020 (CAP 2020) provides a major update, outlining a five-year roadmap to achieve 67% reductions from 2007 levels by 2020. It was developed through a two-phase consultation process with the university community between May 2015 and June 2016. The UBC Board of Governors approved it in June 2016.

The project team of staff, researchers, and external collaborators held four workshops, one each on behaviour change, fleet, energy supply, and buildings. The team evaluated ideas based on technical and financial feasibility and elicited public input through six open houses. Feedback included support for expanding biomass capacity at the Bioenergy Research Demonstration Facility, retrofitting existing buildings, planning more sustainable transportation, and fostering behaviour change. The process also raised concerns on issues such as health, safety, and costs.

Approval process Phase 1 of CAP2020 was presented to the Board of Governors in 2016 to advance UBC's 67% reduction target. This phase focused on demand-side management³ (DSM) actions and the development of campus energy supply options which were to be advanced in Phase 2. Phase 2 contained an analysis of energy supply options including an energy commodity study and preliminary financial analysis. This was presented to the Board of Governors in 2017.

Sources/uses of funds Existing budgets and staff will implement most actions outlined in the plan. A few actions will require additional resources (e.g. new energy supply infrastructure, and behaviour change program staffing) costs. All such actions were proposed based on the opportunity to achieve a life cycle positive return on investment. In addition, a strategic planning initiative led by Sustainability & Engineering is assisting major units such as building operations and energy and water services as they integrate climate action and other sustainability goals, actions, and reporting metrics into operational plans and activities.

Impact of the carbon tax Given the current and rising tax rate on each tonne of carbon, if UBC were to take no new climate action its annual carbon costs could increase from those of today by over \$1M by 2021 and \$5M by 2040.

3. Demand-side management includes building energy efficiency, energy conservation via behaviour change and other strategies to reduce consumption of energy.



Demand-side management (DSM) actions that reduce energy consumption save carbon emissions and associated costs. Projects are identified and approved regularly based on an acceptable payback period, typically two years.

On the energy supply side, shifting to alternative sources may entail capital investment, and each supply will have ongoing costs (i.e., energy cost plus carbon cost, and potentially facility operating costs). As part of UBC's evaluation, the financial criteria for assessing new energy sources include a business case that includes all capital and operating costs over the lifetime of the option. In addition, each supply has its own risks, including future supply availability, price and volatility.

The carbon tax also influences the basic cost-benefit analysis of future energy supply options. For example, to reach toward the 67% GHG reduction target, expansion of the existing Bioenergy Research and Demonstration Facility represented a net-positive business case when accounting for the carbon tax, making the business-as-usual practice of using fossil fuels—that is, expanding natural gas boilers—less attractive.

Other key implementation impacts Beyond reducing greenhouse gas emissions, there are many potential co-benefits of further climate action at UBC:

- Reducing energy and carbon costs relative to business as usual by millions of dollars per year;
- Mitigating UBC's exposure to future volatility in conventional energy costs and increasing carbon liability;
- Creating more comfortable, durable, and reliable buildings;
- Leveraging technology innovation, research, and development at UBC and with industrial partners;
- Leveraging external funding for innovation and research;
- Integrating sustainability challenges within the academy and capitalizing on teaching and learning opportunities; and
- Bolstering UBC's international reputation and leadership in climate action and sustainability.

These co-benefits are considered alongside technical, financial, risk and other criteria when assessing new climate actions. UBC's Bioenergy Research and Development Facility (BRDF) is an example of a project that has played a large role in reducing campus GHG emissions, in addition to achieving many of the above co-benefits.