

UBC OKANAGAN CAMPUS

Climate Action Plan 2030

Bold ambition. Collective action.



December 2021



THE UNIVERSITY OF BRITISH COLUMBIA

ACKNOWLEDGMENT

We begin by acknowledging that UBC's Okanagan campus is located on the unceded territory of the Syilx (Okanagan) peoples and that UBC's activities take place on Indigenous lands throughout British Columbia and beyond. The Syilx Okanagan people have been here since time immemorial. In September 2005, the Okanagan Nation Alliance officially welcomed UBC to Okanagan territory in a ceremony, Knaqs npi'Ismist, where UBC signed a Memorandum of Understanding with the Okanagan Nation Alliance. The university works with the Okanagan Nation in the pursuit of campus plans for UBC Okanagan in respectful acknowledgement of the Syilx Okanagan people's stewardship of their territory for thousands of years.

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Executive Summary

This is UBC Okanagan's first Climate Action Plan (UBCO CAP 2030) developed by the Okanagan campus to address the growing climate emergency and accelerate greenhouse gas (GHG) emission reductions from campus operations and extended (indirect) sources. This Plan outlines an ambitious path of GHG emission reductions for the campus, while also providing a platform for teaching, learning and research through Campus as a Living Lab initiatives that address the climate imperative.



Figure 1: UBCO GHG Emissions 2019 by Source (tonnes CO₂e)

Total UBC Okanagan GHG emissions in 2019 were approximately 17,000 tCO₂e (tonnes of carbon dioxide equivalent), with extended impact emissions comprising approximately 85% of those emissions. With projected future growth, the business as usual forecast demonstrates that UBCO's GHG emissions will continue to increase substantially across all areas without further action.

UBC's Climate Emergency Declaration and Climate Emergency Community Engagement process reaffirmed UBC's commitment to accelerate emissions reductions in alignment with the [Paris Agreement](#) of limiting global warming to 1.5°C. Building on input received from the UBC Okanagan community through the Climate Emergency Community Engagement process, over 130 staff, faculty and students from across both campuses were engaged to develop targets, actions and implementation pathways across all goal areas. This Plan puts forward targets specific to the Okanagan campus and targets for both campuses that will achieve the 45% reduction by 2030, in support of the Paris 1.5°C target. The Plan's targets are organized into the following categories:

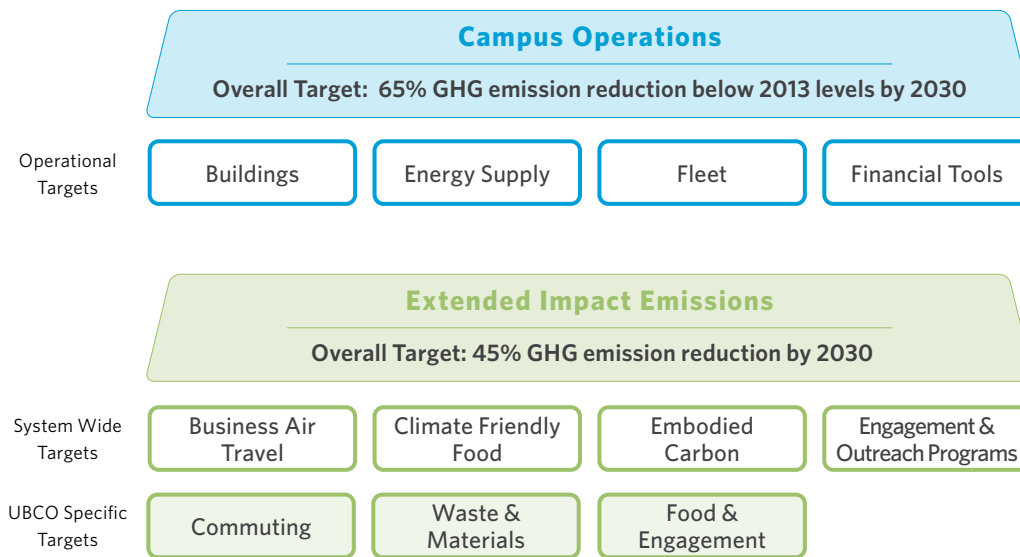


Figure 2: UBCO CAP 2030 Targets

The UBCO CAP 2030 is a UBC-wide effort, across both the Okanagan and Vancouver campuses, that will require leadership, resourcing, cross-campus engagement with the academy and collaboration from many units across both campuses.

Resourcing this Plan will require units to leverage existing staffing through reallocation and reprioritization of work programs, and ongoing leadership to plan, resource and implement actions aligned with the strategic priority to address climate change. Partnership opportunities will continue to be pursued with utilities, industry, government and the academy to invest in low carbon solutions. Financial mechanisms and price signals will be identified that support behavioural change while helping to fund emission reductions (e.g., the sustainable transportation levy).

This Plan includes an accountability framework that outlines responsibilities for implementation, monitoring progress, and governance for decision making over time. Accountability will be achieved through alignment of programs, plans, policies and projects as well as decisions and funding to help reduce GHG emissions and mitigate future impacts of climate change.

1. Introduction

1.1 A CALL TO ACTION

Through this Plan UBC is creating a Vision Statement for climate action that guides accelerated action in the CAP 2030 for both the Okanagan (UBCO CAP 2030) and Vancouver campus:

The Climate Action Plan 2030 will position UBC as a model of how universities can mobilize to address the climate emergency and Paris Agreement targets through bold, impactful actions to accelerate and deepen reductions across operations, and expanded action on reducing indirect emissions.

Three objectives for the UBCO Climate Action Plan 2030 are reflected in the Vision statement and UBC's Climate Emergency Declaration mandate. The objectives provide direction to help achieve the Vision.

- 01** Establish greenhouse gas (GHG) emission reduction targets for 2030.
- 02** Accelerate the decarbonization of campus operational GHG emissions to achieve a "net-positive performance in operational energy and carbon" by 2050.
- 03** Widen the scope of GHG reduction activity to extend UBC's influence to address emission reductions in areas such as commuting, air travel and food.

This is UBC Okanagan's first climate action plan. It builds on existing plans and climate achievements of the campus. Informed by the Vision Statement and objectives, this Plan provides UBCO-specific GHG emission reduction targets and actions, as well as cross-campus (Vancouver and Okanagan) actions that support UBC system-wide GHG emission reduction targets across ten action areas (Figure 1). Targets are aligned with the Paris Agreement goal of limiting global temperature increases to less than 1.5°C. This Plan also helps to advance two of the nine strategic priority areas identified by UBC's Climate Emergency Task Force Report that was endorsed in principle by UBC Board of Governors.

UBC'S CLIMATE EMERGENCY DECLARATION

In December 2019, UBC's Board of Governors unanimously endorsed a [Declaration on the Climate Emergency](#). Joining over 1,700 jurisdictions around the world UBC is committed to accelerate emissions reductions in alignment with the [Paris Agreement](#) of limiting global warming to 1.5°C. Meeting the 1.5°C Paris Target (IPCC pathway) requires a global net anthropogenic GHG reduction of 45% from 2010 to 2030 and reaching net zero around 2050.

UBC's declaration recognizes the severity, complexity, disproportionate impacts of, and responsibilities for, the climate crisis. It commits UBC to develop a collective response that embeds climate justice throughout its activities and priorities. With this endorsement, the UBC Board of Governor's emphasized that climate action continues to be a top strategic priority for the University. Specifically, the Declaration gives impetus for UBC to update plans to address the climate crisis with the urgency it requires.

This Plan addresses how climate action is envisioned to advance across operational and extended impact emission areas and is rooted in supporting the academic mission. It provides a critical platform for climate informed teaching, learning and research and aligns with the vision and values of multiple campus plans. Notably, this Plan supports [Outlook 2040](#)'s vision of a globally connected, regionally engaged campus, responsive to 'grand' global challenges, including climate change.

This Plan's actions are designed to align with embedding wellbeing, equity and diversity across university systems and structures – foundational to the [UBC Wellbeing Strategic Framework](#), [Inclusion Action Plan](#) and [Indigenous Strategic Plan](#) - and to consider indigenous perspectives on climate and sustainability, in alignment with the [UBC Okanagan Truth and Reconciliation Commitments](#) for meaningful support for reconciliation. This approach is ongoing and achieves significant co-benefits across many of this Plan's emission themes, particularly those related to extended emissions.

This Plan's implementation is supported by a Resourcing Strategy and an Accountability Framework. The Resourcing Strategy provides the overall approach for resourcing the many actions and resulting future projects and programs identified in this Plan. The Accountability Framework provides a mechanism and process for UBC units to report on their progress and achievements toward UBCO's Climate Action Plan 2030 Board-approved targets.

1.2 PURPOSE OF THE UBCO CAP 2030

This Plan provides the overarching campus climate policy direction to guide the campus to make informed, strategic policy and investment decisions to reduce GHG emissions, to reduce medium to longer term operational costs associated with increased carbon pricing, and to continue to demonstrate UBC's commitment and leadership to address climate change. This Plan also underscores the imperative for the campus to take adaptive measures in response to climate change and articulates UBC Okanagan's immediate climate adaptation response and actions going forward.

Successful delivery of UBC's climate action will require all parts of the UBC community to be engaged and to participate to achieve collective impact. This is especially true for addressing UBC's extended impacts, such as commuting, air travel, food and waste. Supported by UBCO's program development, tools, resources, and purchasing policies, UBCO students, faculty and staff, through their own individual choices, have an opportunity to take action and contribute to these emissions reductions.

Some actions in this Plan are already underway, or set to begin, while others will require further study to advance. Through strategic investment decisions in high-impact climate action areas over the next ten years, UBC Okanagan is setting a course to leverage institutional, operational and intellectual capacities to chart a leadership path for other similar post-secondary institutions to emulate. These investments will support the attraction and retention of students and top talent at every level of the organization.

Further, the anticipated advancement in campus decarbonization and energy efficient technologies, and the advancement of behavioural, social and cultural policies and tools to reduce extended impact emissions, will provide an opportunity for partnering with faculty researchers devoted to help advance innovation in these areas, positioning the University as a testbed of innovation.

As a regional innovator and change agent, UBC Okanagan is a place where investments in climate action amplify well beyond campus boundaries.

1.3 KEY DRIVERS FOR THIS PLAN

Significant and adverse effects of climate change are visible today, from heat waves and wildfires, to flooding and unprecedented storm events. These changes can be expected to intensify over time, as documented in the recent [Climate Projections for the Okanagan Region Report](#) (2020) issued by three Okanagan Regional Districts.

Accelerated action to reduce reliance on fossil fuels and plan for adverse effects is a global imperative and a shared responsibility. The urgency to act is underpinned by the latest science which demonstrates that global emissions will need to fall by approximately 45% from 2010 by 2030 to avoid the most detrimental impacts, reaching 'net zero' by 2050¹. In Canada, warming is occurring and will continue to occur at twice the rate of the rest of the world, accelerating heat, drought and wildfire impacts and future risks². Locally, the Okanagan has experienced extreme weather conditions, including level four summer droughts, devastating wildfires and smoke, and record high temperatures in recent years³. The recent [IPCC report](#) (Climate Change 2021: The Physical Science Basis⁴) concludes that the frequency and intensity of regional hot extremes and ecological droughts will increase in direct relation to increasing global warming. Continued, immediate campus response to recent heat waves and climate fires is a key action in this Plan.

1.3.1 INTERNAL POLICY DRIVERS

The UBCO CAP 2030 is informed by and supports the implementation of several important UBC Plans:

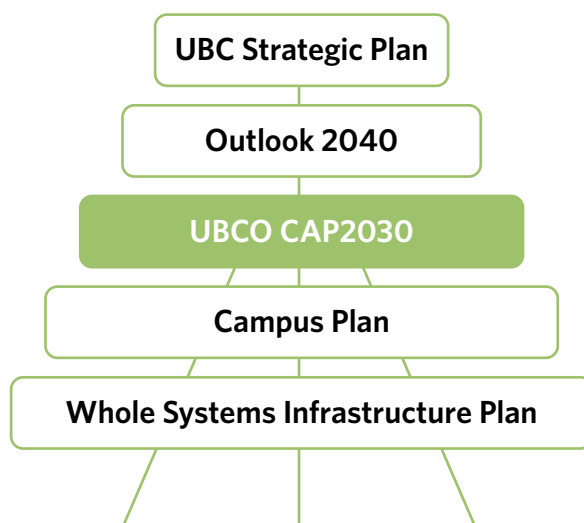


Figure 3: Internal Policy Background

¹ IPCC, October 8, 2018. IPCC Press Release: Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C approved by governments. https://www.ipcc.ch/site/assets/uploads/2018/11/pr_181008_P48_spm_en.pdf

² Environment and Climate Change Canada, April 2019. Canada's Changing Climate Report. https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/Climate-change/pdf/CCCR_FULLREPORT-EN-FINAL.pdf

³ City of Kelowna Climate Action Website, accessed March 2019 <https://www.kelowna.ca/our-community/environment/climate-action>

⁴ <https://www.ipcc.ch/report/ar6/wg1/>

UBC Strategic Plan

[UBC's Strategic Plan: Shaping UBC's Next Century \(2018-2028\)](#), asserts UBC's climate leadership as a key priority. It states,

"The challenges around climate change are high. We need to intensify our academic and operational efforts on our campuses, in affiliated communities around the world. We must go beyond minimizing harm to becoming net contributors to human and ecological health."

The UBCO CAP 2030 will help define how sustainability and climate change will support UBC's efforts to shape the next century. The UBCO CAP 2030 also helps to advance two of the nine strategic priority areas identified by UBC's Climate Emergency Task Force Report that was endorsed in principle by the UBC Board of Governors. These include accelerating UBC's emissions reductions in response to the climate emergency and support community wellbeing in the face of the climate crisis.

Outlook 2040

Founded on UBC's Strategic Plan, the [UBC Okanagan Outlook 2040 Plan \(2019\)](#), provides a future view of the Okanagan campus to support the academic priorities and mission of the campus. In fulfilling this priority, the Plan calls out climate change as one of the three grand challenges universities will need to respond to, envisioned at UBCO through educating future leaders and leading by example. The Plan's forecasts of institutional growth provide the basis for population data used to develop the UBCO CAP 2030 GHG emissions scenarios.

Campus Plan

The [UBC Okanagan Campus Plan \(2015\)](#) sets out a vision for the physical development of the campus and provides a long-term planning framework to manage future campus growth and to support the University's strategic plan and academic mission. The Campus Plan incorporates key principles and design considerations that are characteristic of the Okanagan context and climate. It is referenced in conjunction with subsequent infrastructure plans to inform the UBCO CAP 2030's growth projections.

Whole Systems Infrastructure Plan

The [Whole Systems Infrastructure Plan \(WSIP\) \(2016\)](#) provides a high level plan for sustainable campus development to 2030 and beyond, that addresses energy, carbon, water, landscape, ecology, biodiversity and engagement to ensure that the campus is resilient to future changes in growth, utility rates, and climate change. The WSIP sets the Okanagan campus' first climate action goal to achieve a "net-positive"⁵ performance in operational energy and carbon" by 2050. The UBCO CAP 2030 provides the interim operational reduction target of 65% by 2030, on the pathway to the campus' net-positive by 2050 goal. Continued implementation of the WSIP's campus-scale water, landscape, ecology and biodiversity actions are required to support climate adaptation and resiliency.

⁵ The goal that a development adds value to living systems (social and/or ecological systems); buildings that generate more resources/energy than they consume (Pamela Mang & Bill Reed, *Building Research Information*, 2014).

1.3.2 EXTERNAL POLICY DRIVERS

There are significant financial and social costs associated with climate change. Carbon pricing is the primary Provincial and Federal mechanism to address these impacts and reduce GHG emissions. As the provincial and federal governments continue to increase the carbon tax associated with fossil fuel purchases, and with the continued mandate of public sector organizations such as UBC Okanagan to purchase carbon offsets to maintain a carbon neutral public sector in BC, UBCO's carbon liability will continue to grow over time. Under the business as usual scenario, UBCO's operational carbon liability is anticipated to reach over \$500,000 annually by 2030, and a cumulative total over \$3 million (from 2021-2030), if no new actions are taken⁶. Further campus investment in clean solutions required to achieve the targets set out in this Plan will also serve to reduce the campus' overall carbon liability, creating the greatest impact and co-benefits for a given level of investment and effort.

Many rapidly-changing external policy drivers have influenced the direction of the UBCO CAP 2030, and will continue to inform this Plan's direction as it is implemented.

Transportation & Land Use	<ol style="list-style-type: none"> 1. BC Government's Zero-Emission Vehicle Act: 100% of new vehicle sales to be zero-emission vehicles by 2040, including 10% by 2025 and 30% by 2030 2. BC Government's Renewable & Low Carbon Fuel Requirements Regulation: reduce lifecycle carbon intensity of fuel by 20% by 2030
Buildings	<ol style="list-style-type: none"> 3. BC Building Step Code: 20% more energy efficient by 2022 and 80% more efficient by 2032 (net zero energy ready standard) 4. Federal Government's escalation of carbon price on fuels to \$170 tCO₂e by 2030. Public sector offset requirements add an additional \$25 / tCO₂e to this cost⁷ 5. BC Government's amendment for increased supply of renewable natural gas (RNG), hydrogen, and other clean fuel sources (15% renewable content in natural gas by 2030) to support transition to renewable fuel economy. 6. BC Government's updated GHG emission intensity factors for electricity use in BC integrated grid-connected entities. 7. BC Government's requirement for post-secondary capital project submissions to reduce GHG emissions by 50% (relative to LEED Gold)
Waste	<ol style="list-style-type: none"> 8. BC Government organic waste: 95% of organic waste diverted from landfills and turned into other products by 2030

⁶ The carbon liability estimate assumes that UBCO continues to purchase offsets at \$25 per tonne CO₂e (under the provincial carbon neutral public sector initiative), and that the carbon tax increases annually by \$15 per tonne CO₂e, reaching \$170 per tonne CO₂e by 2030 (under proposed federal carbon tax).

⁷ To support these reductions by discouraging pollution-intensive investments and increasing affordability of cleaner options, the federal government is also proposing to increase the carbon price by \$15 per year, starting in 2023, rising to \$170 per tonne of carbon pollution in 2030.

2. UBCO CAP 2030 Approach

2.1 BUILDING ON OUR STRENGTHS

UBC Okanagan is an innovative hub for teaching, learning, research, and innovation situated in the heart of Syilx Okanagan Territory. The campus is a close-knit academic community that has experienced rapid growth. Over the last 10 years, staff, faculty and student population has increased by 209% from 3,975 to 12,279 and is projected to reach as high as 15,000 to 20,000 by 2040⁸.

Since 2007, the number of buildings on campus has increased from 12 to 46. At the same time, GHG emissions from buildings alone have dropped by 7% despite extraordinary growth and transformation of the campus. In 2019, UBC Okanagan buildings emitted 2,240 tCO₂e - a 28% reduction from its 2013 baseline⁹, achieving an average emissions intensity that is 30% less than BC Campuses¹⁰. Legacy investments of over \$1.5M in the past five years has made the Okanagan campus a leader in low-carbon district energy supply to buildings, resulting in a low operational carbon baseline. With successful implementation of many 'low-hanging fruit' options, will come the need for deeper investments over the longer term to achieve the levels of decarbonization committed to in this Plan.

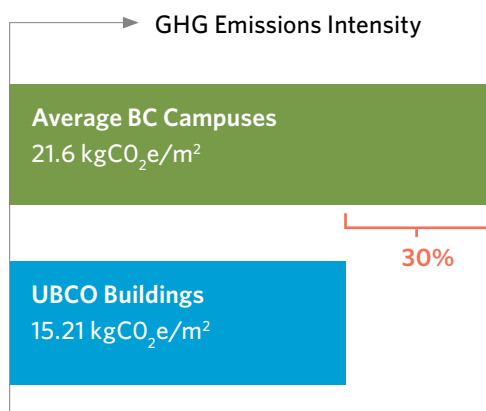


Figure 4: UBCO GHG Emissions Intensity Performance (2019)

⁸ UBC Okanagan Outlook 2040

⁹ 2013 was selected as UBCO's baseline year, as it represents the point at which the first major phase of new campus development was complete; the district energy system closed loop conversion was complete, and campus energy performance levelled off.

¹⁰ 7th Annual PUMA Benchmarking Summary for BC Advanced Education, 2019

This Plan puts forward priorities to advance climate action that build on UBC Okanagan’s strengths, distinct campus setting, regional context and current conditions. It provides Okanagan-specific GHG emission reduction targets and actions where local conditions apply - buildings, energy supply, commuting, food, waste and materials, and outreach and engagement. This Plan also aligns with UBC system-level targets and actions (described in [section 5](#)) and related Okanagan and Vancouver plans and initiatives referenced in this Plan.

2.2 A SYSTEMS APPROACH

This Plan identifies actions that will be led and advanced by the Okanagan campus, as well as opportunities for the Okanagan campus to leverage and tailor actions developed for UBC as a system. Policy-level actions being developed for UBC, (e.g., business air travel), will inform actions required for UBC Okanagan to achieve UBC’s system-wide targets articulated in this Plan. This approach necessitates key cross-campus linkages and dependencies related to financing, staff resources, and roles between the two campuses. Taking a systems approach, where it makes sense, amplifies investments, creating a bigger impact beyond one campus.

Examples of actions being developed for UBC:

Business Air Travel Policy & Embodied Carbon

Actions led by both Campuses:

Climate friendly food; Outreach & Engagement

2.3 BEYOND MITIGATION

While this Plan focuses on climate mitigation to reduce fossil fuel impacts, responding to climate change will also require the development of adaptation strategies to reduce the effects of climate change. Climate adaptation, resilience and biodiversity planning will prepare the campus to protect its infrastructure and ecological assets against future climate risk, and lay the groundwork for anticipated new regulatory climate resiliency planning and reporting requirements, expected to follow from the release of [Clean BC’s Climate Preparedness and Adaptation Strategy](#) anticipated in 2022.

In consideration of the devastating local impacts of climate change, there will be a continued immediate campus response to recent heat wave and wildfires, with a focus on building retrofits, addressing indoor air quality measures for wildfire smoke, and adapting UBC’s Climate Ready Building Requirements for new construction. The development of a Climate Adaptation, Resiliency and Biodiversity Strategy that incorporates other related UBC Okanagan plans, policies and initiatives will follow as a subsequent UBCO CAP 2030 phase (Ref: [Section 5.5](#)).

2.4 LESSONS FROM THE COVID-19 PANDEMIC

This Plan was developed and completed during the COVID-19 pandemic, which offered an unprecedented time of learning for UBC Okanagan, and for society in general. With classes moved online and a significant reduction in on-campus activities, the pandemic reduced operational and extended emissions associated with the UBCO campus.

Emerging policy reflections that require further development include maintaining the quality of experience while leveraging learning from remote working and online class delivery, ensuring flexibility and accommodations remain in place to support student, staff, and faculty well-being, and managing space to reduce energy use, GHG emissions and associated costs. Specific lessons and actions emerging from the COVID-19 pandemic are referenced in the relevant sections below. The pandemic has had little impact on the analysis presented in this plan as most findings are based on the data collected in pre-pandemic periods. Moving forward, the impacts of this pandemic on campus travel patterns, air travel, and the issues and opportunities it presents in the near future will be monitored through the UBCO CAP 2030 implementation process.

More generally, the COVID-19 pandemic has heightened public awareness of systemic racism against IBPOC (Indigenous, Black and People of Colour) communities, and this message was heard strongly through the climate emergency engagement process and recommendations framed around its nine strategic priorities to address the climate crisis. Climate justice must be advanced in conjunction with institutional responses to today's multiple intersecting crises, which compound inequalities faced by marginalized populations.

2.5 CLIMATE JUSTICE

A climate justice lens has informed the development of actions in this Plan to ensure equity, inclusion and diversity are upheld and advanced while climate action is accelerated. Throughout the development of the CAP 2030, working groups have considered how to advance climate action while enhancing equity when working to reduce emissions. Addressing climate justice is particularly relevant when developing climate actions related to food systems (e.g., considering the supply and affordability of nutritious food) and commuting (e.g., affordable low carbon transportation systems). UBC's understanding of climate justice will continue to evolve and we will seek to integrate this learning to inform our planned actions.

2.6 CO-BENEFITS OF CLIMATE ACTION AND RISK MITIGATION

Taking strong action on climate change is critical to improving UBC Okanagan's contribution to reducing globally harmful GHG emissions. This is, however, far from the only benefit. Advancing an ambitious UBCO CAP 2030 will further many other UBC interests, including:

- Protect UBCO against the increasing costs of carbon policy at the provincial and federal level;
- Mitigate UBCO's exposure to future volatility in conventional energy costs;
- Increase resiliency, capacity, and diversification of UBCO's energy infrastructure in the face of climate change;
- Future-proof UBCO's buildings to the impacts of climate change, through the use of a passive measures first approach, while integrating whole systems infrastructure considerations regarding active cooling strategies;
- Align action among multiple stakeholders at all levels of government (e.g., enhanced transit services);
- Promote and foster the development of sustainable products at a national and local level through technical guidelines, procurement and other policy mechanisms;
- Build industry and regional capacity in upper Step Code design and construction through new, innovative building projects;
- Establish access to new markets and emerging technologies;
- Leverage technology innovation, research, and development at UBCO with Industry partners;
- Leverage external funding to advance key research and innovation priorities by UBCO;
- Increase external investments into campus infrastructure priorities;
- Build internal leadership capacity in climate action;
- Support sustainability challenges within the institution and capitalize on teaching and learning opportunities; and
- Bolster UBCO's internationally recognized reputation and leadership in climate action and sustainability in operations and research.

These co-benefits are being considered alongside technical, financial, risks, and other criteria when assessing future investments in UBCO CAP 2030 priorities.

3. Plan Development Process

The UBCO CAP 2030 process began in early 2020. The process was led by Campus Planning, Sustainability Office, with strategic oversight and direction provided by a project Steering Committee with representation from faculty and administrative leadership. Early technical work identified commuting emissions to be the largest source of emissions, which supported the need for the UBC Okanagan Transportation Plan, developed in parallel to this Plan.

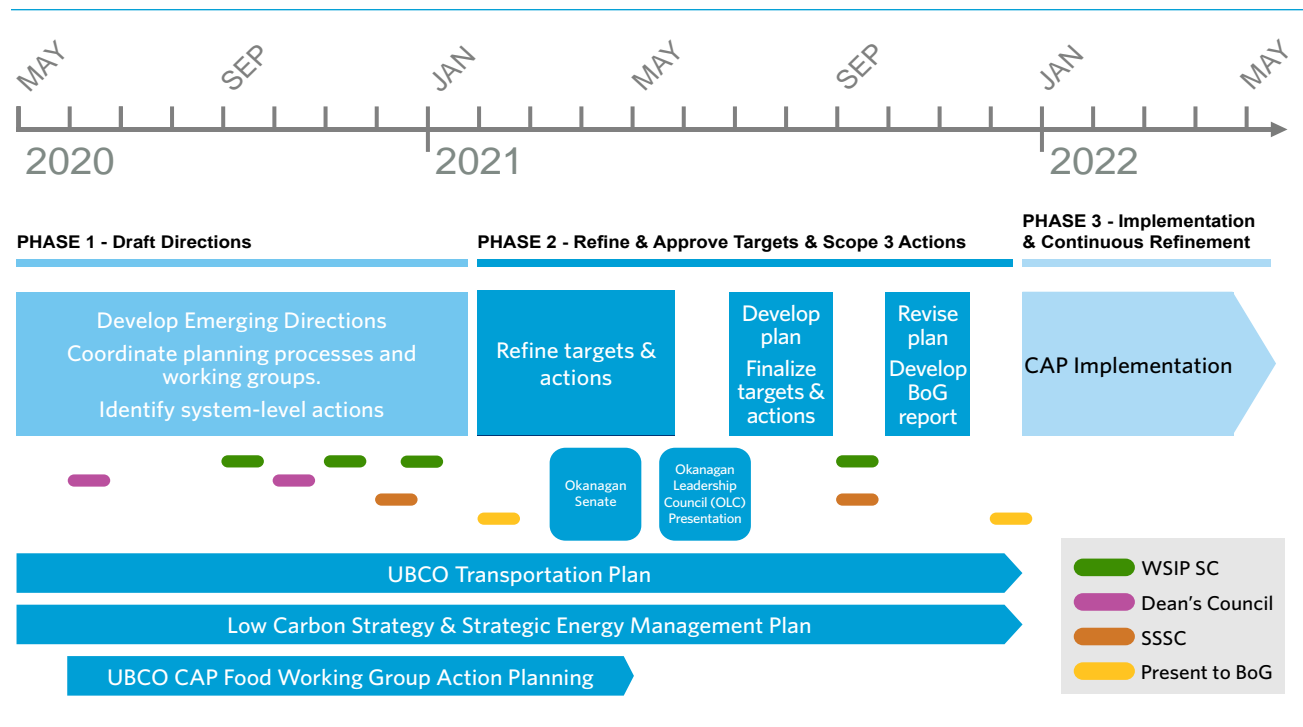


Figure 5: UBCO CAP 2030 Process Overview

[Note: WSIP SC = Whole Systems Steering Committee, SSSC = UBC's Sustainability Strategy Steering Committee, BoG = UBC Board of Governors]

The UBCO CAP 2030 planning process supported key campus plans with the greatest potential to reduce the largest sources of carbon the campus emits:

- **Okanagan Transportation Plan**
- **Low Carbon Energy Strategy**
- **Strategic Energy Management Plan**
- **Climate Friendly Food Strategies**

UBC working groups were established to develop targets and actions for all CAP topic areas. Actions in areas that apply to both Vancouver and Okanagan campuses were identified for Vancouver-led engagement (e.g., business air travel and embodied carbon). Key Okanagan staff and faculty were engaged to develop Okanagan-specific CAP recommendations. Following this, emerging directions and draft targets for CAP 2030 – Vancouver and Okanagan Campuses were presented to the Board of Governors in February 2021.

As Okanagan actions were developed and refined, targeted stakeholder meetings were held with key staff responsible for leading or supporting specific actions. These meetings gathered support for implementation, identified resources currently being mobilized, and confirmed roles and responsibilities moving forward.

Stakeholders across both campuses were engaged during the development of this plan. UBC Okanagan engaged over 130 Okanagan staff, faculty and students in the development of targets, actions and implementation pathways to support both Okanagan and system-wide actions (Appendix B).

3.1 PUBLIC ENGAGEMENT PROCESS

From March 29 – April 16, 2021, the Campus and Community Planning team lead a university-wide public engagement process on CAP 2030 across both campuses. Okanagan engagement provided the opportunity for UBC Okanagan community members to learn about the emerging UBCO CAP 2030, ask questions, and share perspectives through two campus-wide virtual public open houses and an online survey. Key public consultation highlights are shown in Figure 6. Further information on the main themes heard during the UBCO CAP 2030 public engagement process can be found in the UBCO Public Engagement Report (Appendix C).



Figure 6: UBCO CAP 2030 Public Engagement Highlights

4. Addressing Climate Change

4.1 UBCO GHG EMISSION SOURCES & CONTRIBUTIONS

UBCO's GHG emissions are generated from various sources, as illustrated below.

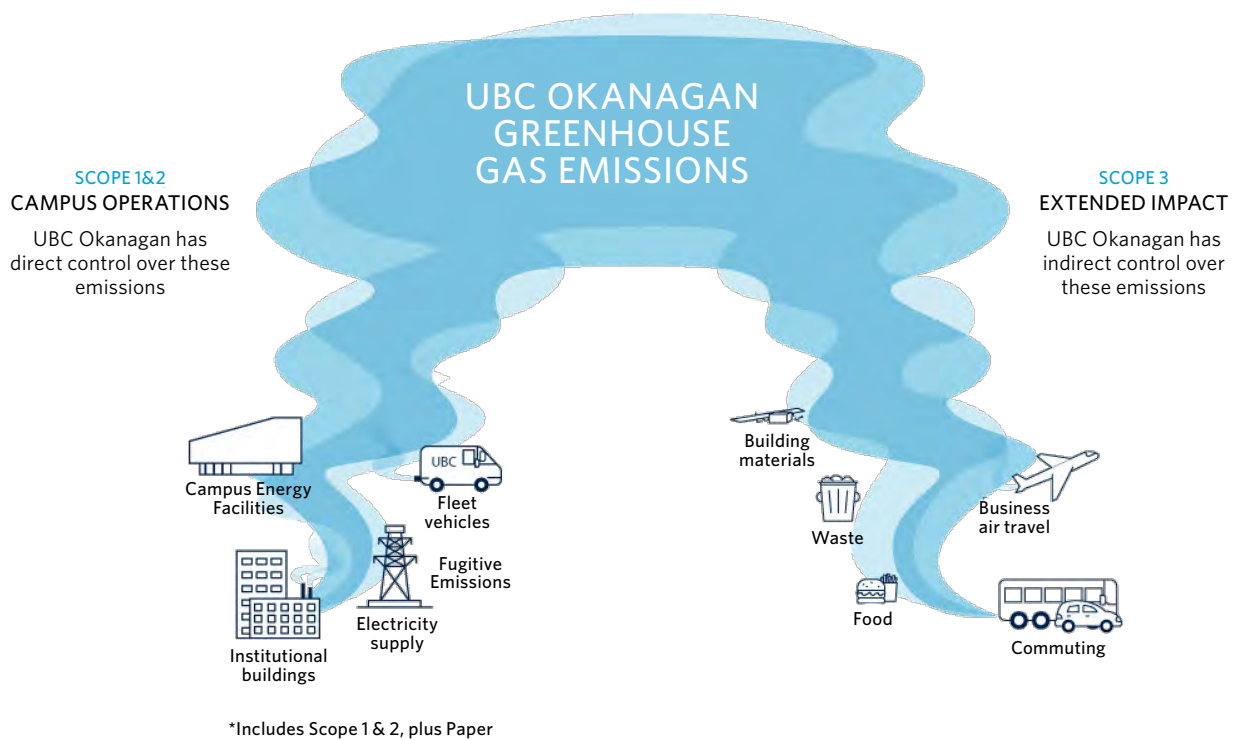


Figure 7: UBCO Operational and Extended Impact Emissions

4.1.1 CAMPUS OPERATIONS EMISSIONS (SCOPE 1 AND 2)

Campus Operations Emissions are those that UBC has direct control over and pays carbon offset taxes on through the provincial carbon neutral legislative requirements for Public Sector Organizations (PSOs). Sources include emissions from buildings, campus energy facilities and fleet vehicles. Reducing these emissions requires infrastructure change and capital investments. To date, these emissions have been successfully reduced by enhancing the energy performance of buildings and expanding the campus' existing District Energy System to new buildings.

In 2019, campus operations emissions accounted for 2,024 tCO₂e (tonnes of carbon dioxide equivalent).¹¹ Heating and operating buildings accounted for 92%, and the vast majority came from burning natural gas (96%). Emissions generated from campus operations are defined as emissions from sources directly controlled and operated by UBC (Scope 1), and from upstream emissions from electricity consumed on campus (Scope 2). Electricity accounted for 4% of these emissions.¹²

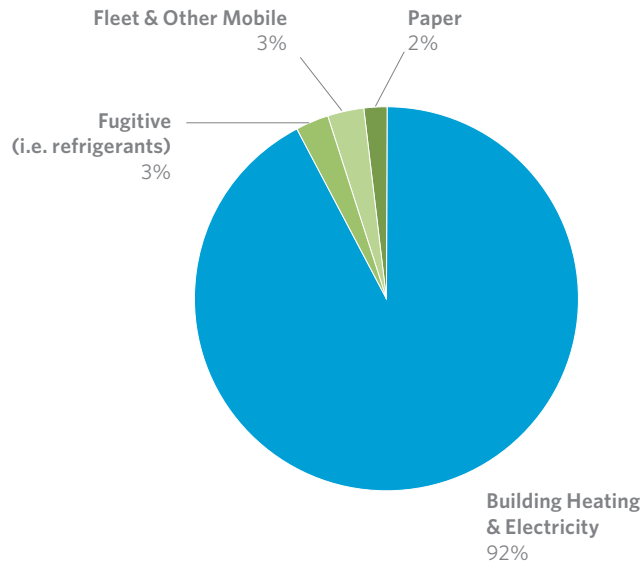


Figure 8: UBCO Campus Operations Emissions (Scope 1 & 2) by Energy Source (2019) UBCO Climate Change Accountability Report

4.1.2 EXTENDED IMPACT EMISSIONS (SCOPE 3)

Extended impact emissions are those that UBC Okanagan does not directly own or control, but indirectly impacts through University activities. UBCO has the ability to influence these emissions through behavioural change campaigns, sustainable supply chain procurement guidelines and others. These emissions are generally referred to as Scope 3 emissions and include sources such as commuting to and from campus, business air travel, food consumed on campus, waste, and building materials. Extended impact emissions are nearly six times larger than campus operations emissions. While UBC has some influence on these emissions, they are also captured as Scope 1 and Scope 2 emissions for our partner organizations¹³. While the University is not responsible for carbon tax or offset payments on them, it is important that we collaborate with our partners to support achieving these reductions.

Reporting on extended emissions is new for UBC Okanagan. Many foundational UBCO CAP 2030 actions will involve refining our measurement methodologies. Reducing these emissions requires policies and programs (such as behavioural change campaigns) that support social change that empowers the UBCO community to affect change through their own actions and choices.

¹¹ Operational GHG emissions inventories are generated annually by Campus Planning, Sustainability Office as required through the provincial Carbon Neutral Government Regulation.

¹² Electricity emissions factors in BC have become somewhat volatile due to a change in emissions factor approach. Analysis for UBC's CAP 2030 targets and actions has been based on recent provider-based electricity emissions factors and this area will be monitored as these factors continue to evolve in the future.

¹³ Examples: building suppliers and products, regional transit fleet vehicles

CAP 2030 is the first climate plan to address UBC's explicit mandate to reduce extended impact emissions. Significantly larger than campus operations emissions, extended impact emissions are estimated¹⁴ to be at least 14,366 tCO₂e in 2019 (Figure 9). The greatest proportion is attributable to staff, faculty and student commuting.

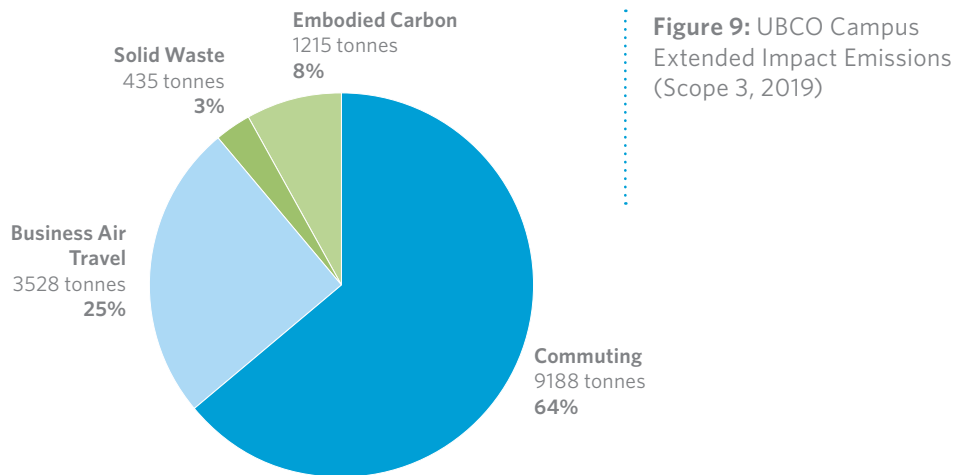


Figure 9: UBCO Campus Extended Impact Emissions (Scope 3, 2019)

4.1.3 TOTAL OPERATIONAL AND EXTENDED IMPACT EMISSIONS (SCOPE 1,2&3)

Total UBCO GHG emissions in 2019 was approximately 17,000 tCO₂e. Extended impact emissions are estimated to be at least six times greater than campus operations emissions (Figure 10).

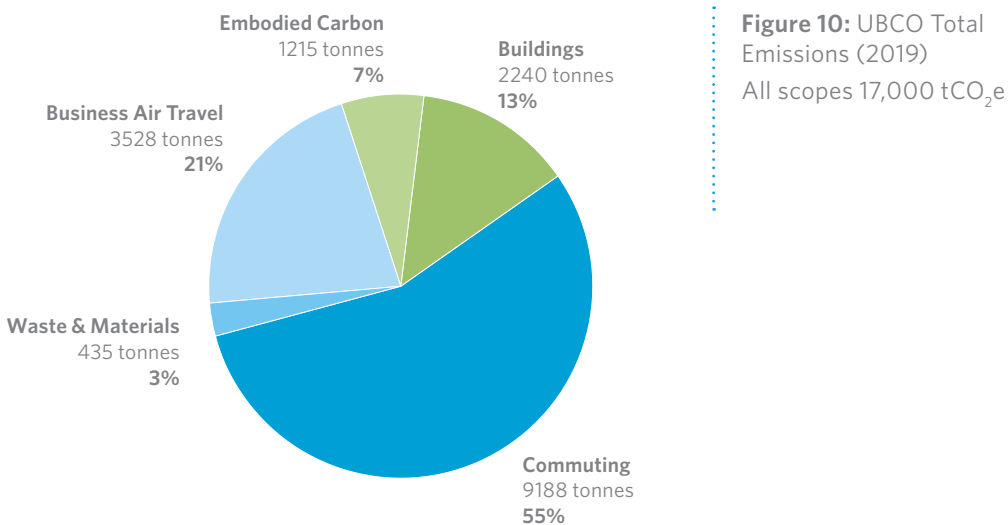


Figure 10: UBCO Total Emissions (2019)
All scopes 17,000 tCO₂e

¹⁴ Extended impact emissions are estimated using consistent UBC methodology and less accurate than campus operations emissions. Embodied carbon uses a standard emissions factor per floor area. Solid waste emissions do not include life cycle emissions, which are much larger.

4.2 BUSINESS AS USUAL GROWTH

This Plan's business as usual (BAU) analysis provides a forecast UBCO GHG emissions with growth, if no new policies or actions are brought into place.

Growth is based on projected changes in student, staff and faculty population and the projected change in building floorspace. In the course of developing the UBCO CAP 2030, it was concluded that Outlook 2040 Scenario 2 was the most likely path forward for campus population growth. This aligns with the UBCO Transportation Plan (Table 1).

DAILY CAMPUS POPULATION PROJECTIONS	
2019 Existing	2040 Outlook Scenario 2
9,300 students	15,310 students
440 faculty	750 faculty
860 staff	1,110 staff
10,600 daytime population	17,170 daytime population

Table 1: Campus population growth projections

Building floorspace projections for residences and academic buildings is also expected to increase from 147,236 to 226,373 GSM (gross square meters) by 2030. These projections are aligned with expected campus infrastructure growth and the Low Carbon Energy Strategy.

The BAU also considers how the emissions per unit of growth will change given known policies or trends in place. These include,

- BC Provincial government commitment to require 100% new light duty vehicle sales to be electric
- Air travel trends based on historical data collected by UBCO
- Solid waste disposal trends based on historical data collected by UBCO

The BAU forecast (Figure 11) demonstrates that despite a strong policy foundation, achievements to date, and a relatively low operational GHG emissions baseline compared to similar universities, UBCO’s GHG emissions will continue to increase substantially across all areas without further action. Due to the location of the campus, and the surrounding low-density land use, emissions associated with commuting to and from campus will continue to be the largest source. It is also notable that emissions from air travel may be the largest area of growth, if based on pre-pandemic trends. Appendix A provides detailed assumptions for the BAU forecast.

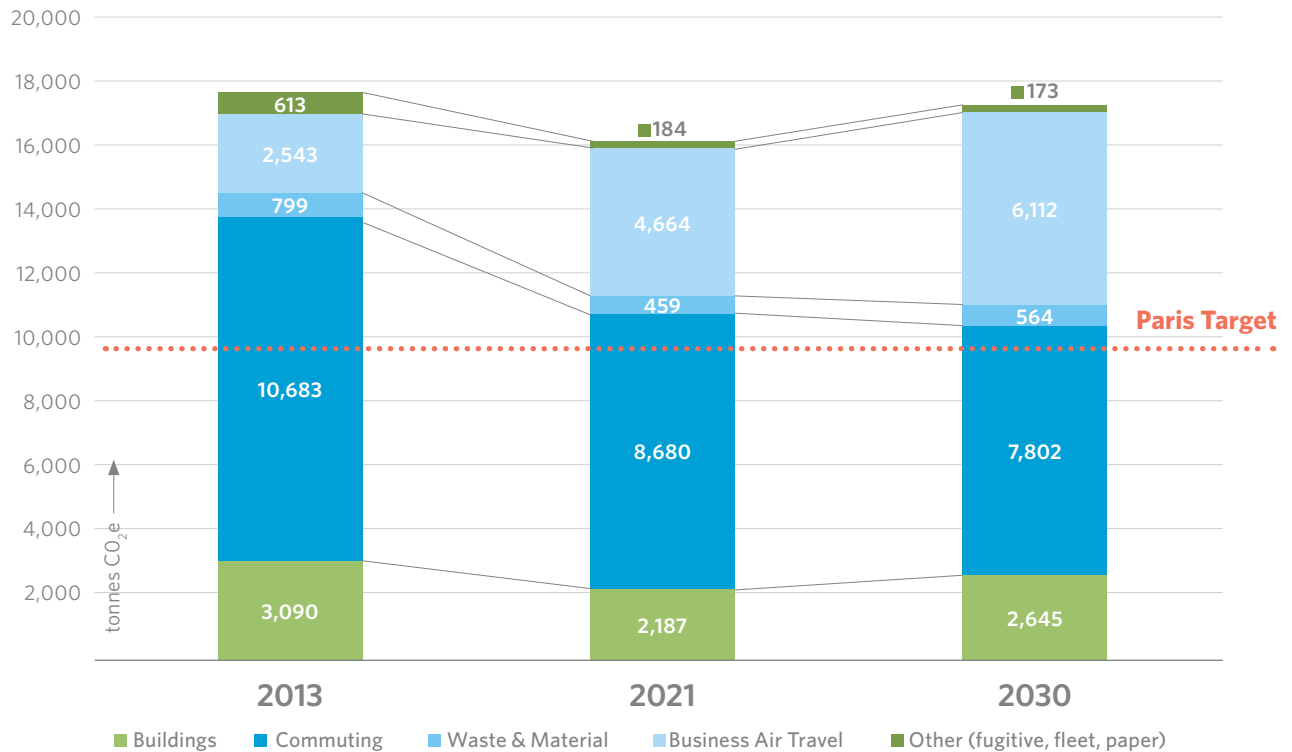


Figure 11: UBC Okanagan BAU (considers policies and trends that influence the rate of GHG emissions growth)

4.3 WHAT THIS PLAN WILL ACHIEVE

Efforts to substantially reduce total campus GHG emissions will involve both addressing existing operations and ensuring growth in services is decoupled from growth in emissions. The following combined emissions reduction scenario¹⁵ shows the combined impact of this Plan’s implementation. Based on current analysis, the campus will achieve a 45% reduction by 2030 to achieve the Paris 1.5°C target, if all actions, strategies and plans articulated in this Plan are implemented.¹⁶

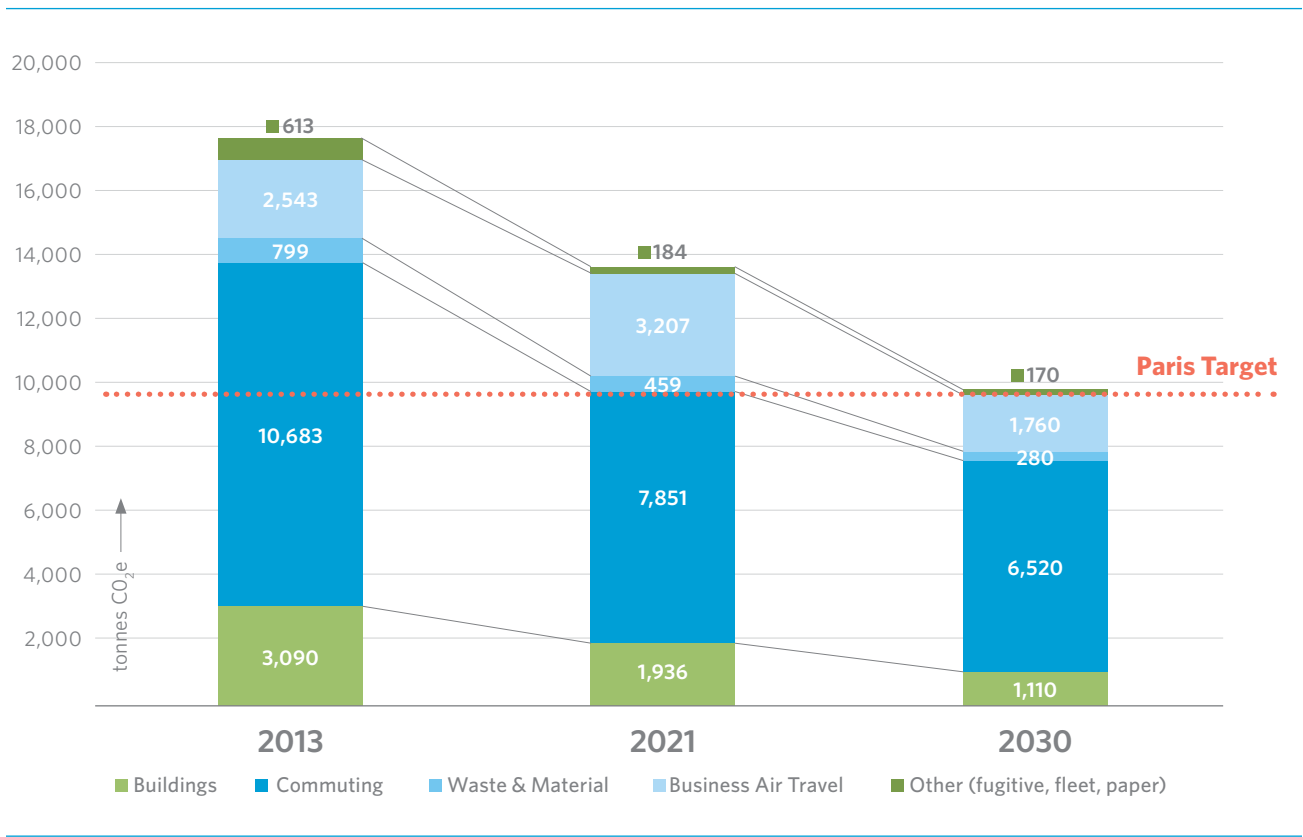


Figure 12: UBC Okanagan Campus GHG Reduction Scenario

¹⁵ The business as usual and reduction scenarios include both operational and extended impact emissions for all categories except embodied carbon. Further analysis is required to estimate the amount of embodied carbon in UBCO buildings constructed since the baseline year, and to forecast embodied carbon under the business as usual and reduction scenarios.

¹⁶ As implementation progresses, there will be opportunity for some targets to progress faster than others, while maintaining the overall extended emissions target of 45%. For example, if there is an accelerated uptake in zero-emissions vehicles, the commuting emissions will reduce more rapidly than forecast.

5. The UBCO CAP 2030 Plan – Targets, Strategies & Actions

This Plan sets the vision, ambitions, targets and pathway of actions to achieving the targets. Actions across campus operations and extended impact emissions have been organized into ten¹⁷ action areas, many of which are already planned or under development, and are being led by different operational units across UBC Okanagan and UBC Vancouver campuses.

5.1 GHG EMISSION REDUCTION TARGETS

This Plan sets the course to 2030 for UBC Okanagan to reach its contribution to the Paris Agreement target of limiting global warming to 1.5°C. Implementation of actions in this Plan provide a reduction pathway to achieve the seven targets outlined below (Table 2 & 3). Estimates are based on currently available data, methods may be updated in future. See Appendix A for detailed assumptions.

UBCO SPECIFIC TARGETS, OKANAGAN DATA				
Campus Operations Emissions				
Buildings & Energy Supply (combined)	2013 Baseline	3,090 tCO ₂ e (2013)	23 kgCO ₂ e/GSM	<ul style="list-style-type: none"> 65% operational GHG emission reduction below 2013 levels by 2030¹⁸
	Projected 2030	1,100 tCO ₂ e	4 kgCO ₂ e/GSM	
Extended Impact Emissions				
Commuting	Baseline	10,683 tCO ₂ e (2013)	1,264 kgCO ₂ e/FTE ¹⁹	<ul style="list-style-type: none"> 40% reduction in commuting emissions from 2013 levels by 2030
	Projected 2030	6,500 tCO ₂ e	480 kgCO ₂ e/FTE	
Waste & Materials ²⁰	Baseline	435 tCO ₂ e (2019)	41 kgCO ₂ e/FTE	<ul style="list-style-type: none"> 50% less waste (per capita) compared to 2020, progressing to a zero waste community
	Projected 2030	280 tCO ₂ e	21 kgCO ₂ e/FTE	

Table 2: UBCO Specific Targets, Okanagan Data

¹⁷ Table 2 excludes two of the ten action areas - fleet and financial tools, as targets do not currently apply to these areas.

¹⁸ The operational CAP Target addresses emissions from institutional buildings including core infrastructure, academic and student housing, excluded are off-campus buildings.

¹⁹ FTE (full time equivalent) includes all staff, faculty and student FTE actuals combined and projections; FTE assumptions may need to be adjusted to align with UBC reporting methodology.

²⁰ Waste emissions do not include life cycle emissions which are much larger.

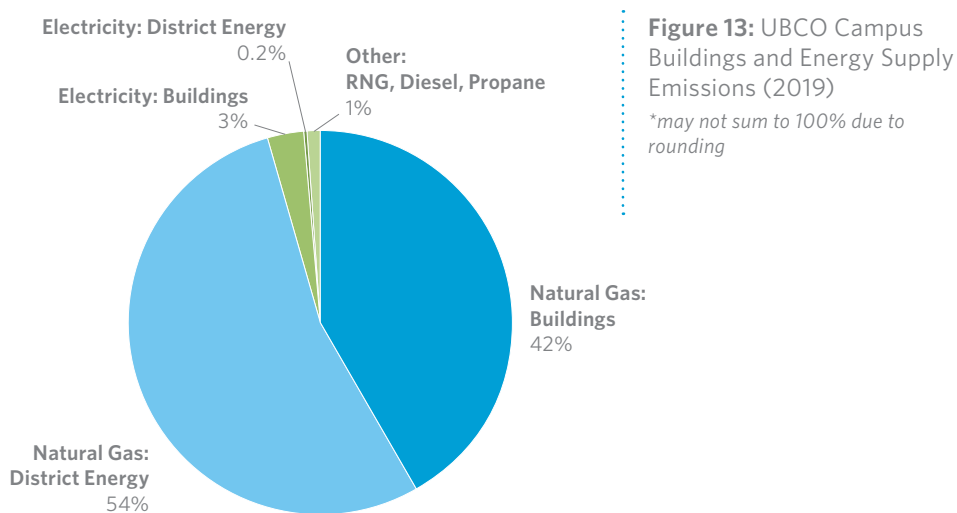
UBC SYSTEM WIDE TARGETS, OKANAGAN DATA		
Extended Impact Emissions		
Business Travel	<ul style="list-style-type: none"> 50% reduction in business air emissions from pre-COVID 2019 levels by 2030 	For these extended emissions, methodology development is in progress and numbers will be refined over time
Food	<ul style="list-style-type: none"> 50% reduction in GHG emission reduction of food systems by 2030 	
Embodied Carbon	<ul style="list-style-type: none"> By 2030, establish an embodied carbon baseline and align new building and renewal designs with a 50% reduction target 	
Outreach & Education	<ul style="list-style-type: none"> By 2030, three quarters (75%) of UBC faculty, staff, and students will be aware of UBC’s climate action goals 	

Table 3: UBC System Wide Targets, Okanagan Data

5.2 CAMPUS OPERATIONS

TARGET : 65% Operational GHG emission reduction below 2013 by 2030

The distribution of GHG emissions resulting from heating and powering campus buildings is shown in Figure 13. The majority of emissions are attributable to natural gas use (buildings and district energy systems), providing a strong case for decarbonization.²¹



²¹ While electricity consumption accounts for a small proportion of GHG emissions, it is notable that electricity emissions factors in BC have become somewhat volatile due to a change in emissions factor approach. Analysis for UBC’s CAP 2030 targets and actions has been based on recent provider-based electricity emissions factors and this area will be monitored as these factors continue to evolve in the future.

The campus is starting from a comparatively low baseline in terms of operational emissions, despite substantial growth. GHG emissions from buildings alone have dropped by 7% since 2007 despite increasing from 12 to 46 buildings - nearly a 300% increase. Early projects to support climate action include the construction of a geothermal district energy system to reduce reliance on fossil fuels for building energy supply. UBC Okanagan was also among the first institutions to partner with FortisBC to pilot a building optimization program to monitor legacy academic building energy consumption and implement energy and carbon reduction measures. While these accomplishments illustrate commitment to climate action, the climate emergency has brought new urgency and need to accelerate action.

Figure 14 illustrates that since 2013, UBC Okanagan has reduced GHG emissions by 33%. Further reductions present both an opportunity and a challenge - technically and financially. The Low Carbon Energy Strategy and 10-Year Strategic Energy Management Plan have identified complementary operational strategies that, if implemented, will enable UBCO to achieve and potentially exceed the new CAP 2030 operational GHG reduction target of 65% reduction by 2030, from baseline. The BAU increase (Figure 14) is based on building floorspace projections for residences and academic buildings, a constant emission factor for electricity 2020 onward²² and a gradual decrease in natural gas emission factor to meet -15% by 2030, in line with the provincial CleanBC commitment. These plans outline actions related to future building retrofits and the decarbonization of future campus energy supply over time.

Achieving a further 65% emission reduction from the campus' 2013 baseline would mean a further reduction of nearly 2,000 tCO₂e, leaving just over 1,100 tCO₂e remaining based on GHG emissions factors and assumptions at the time of this Plan's development.

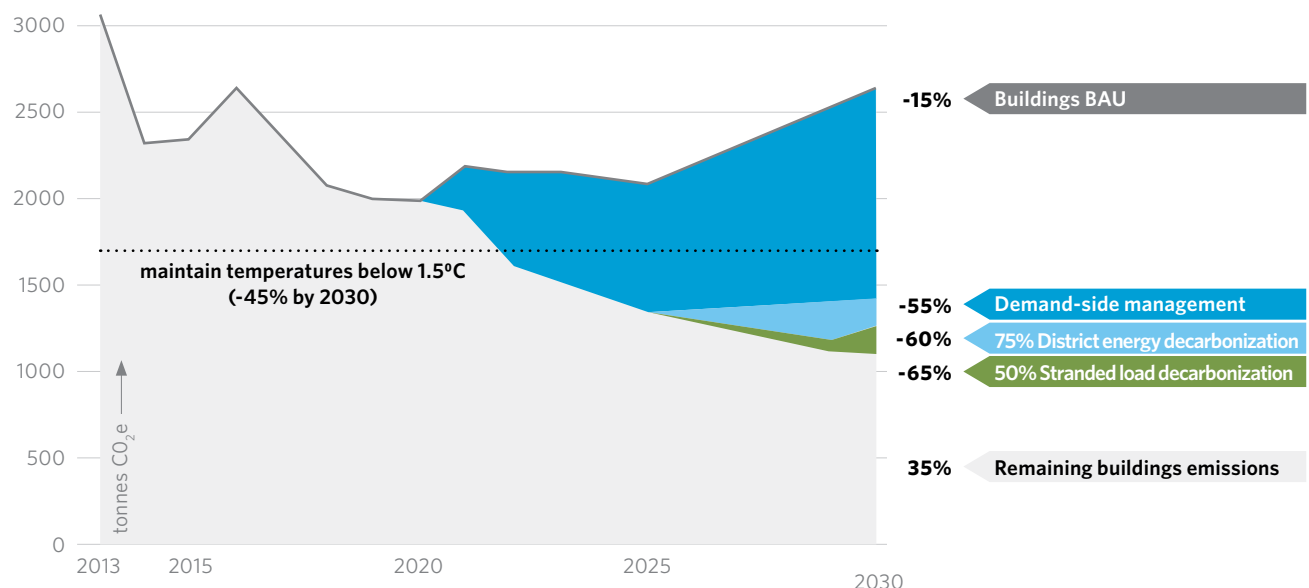


Figure 14: Campus Operations Emissions Reductions Pathways

* Assumes constant emission factor for electricity 2020 onward. Assumes gradual decrease in natural gas emission factor to meet -15% by 2030, in line with provincial CleanBC commitment.

²² UBCO CAP 2030 operational targets and actions have been based on recent provider-based electricity emissions factors. This area will be monitored as these factors continue to evolve in the future.



⋮ Nechako Residence & Commons Block District Energy Supply

5.2.1 BUILDINGS

UBC OKANAGAN-LED ACTIONS

Accelerated Actions (Start F2021-22)

- Eliminate fossil fuel equipment installation in new and existing buildings, unless sufficient amounts of renewable natural gas (RNG) are secured for the lifetime of the equipment.
- Develop UBC LEED® V4.1 Implementation Guide to provide direction and clarification for LEED implementation for new buildings to ensure the Okanagan's climate, energy and environmental characteristics are reflected.
- Reduce emissions from refrigerants used in buildings.
- Develop and implement Okanagan climate-specific building and renewal performance targets by building type²³. Incorporate energy-efficient designs and low carbon energy sources, and create a life cycle costing process that deals with capital budgets to meet low-carbon design requirements.
- Update UBCO Whole Systems Infrastructure Plan (WSIP 2016) to reference UBCO CAP 2030, Green Building Requirements, Low Carbon Energy Strategy, new Building Performance Targets.

²³ Includes Total Energy Use Intensity (TEUI), Thermal Energy Demand Intensity (TEDI), and Greenhouse Gas Intensity (GHGI) targets for each archetype, as well as Energy Conservation Measure (ECM) bundles, costing and financial analysis.

- Initiate a process to append or develop a compendium to the UBCV Green Building Action Plan to indicate building performance requirements for UBCO.
- Continue to implement institutional building performance requirements in UBCO's Design Guidelines' Green Buildings requirements.

UBC OKANAGAN-LED ACTIONS

Short Term Actions (By 2024) & Medium Term Actions (By 2030)

- Implement building retrofits and demand-side management measures within UBCO's 10-Year Strategic Energy Management Plan.

5.2.2 ENERGY SUPPLY

Accelerated Actions (Start F2021-22)

- Update UBC Technical Guidelines for compatibility with UBCO Low Carbon Energy Strategy.
- Implement 10% renewable natural gas (RNG) supply.

Short Term Actions (By 2024) & Medium Term Actions (By 2030)

- Develop and implement Low Carbon Energy Strategy to decarbonize the District Energy System and address 'stranded loads'.
- Implement Phase 1 Air Source Heat Pump (ASHP) 700 kW Project.
- Implement Phase 2 Air Source Heat Pump (ASHP) 700 kW Project.
- Carry out electrical supply demand studies to determine future supply opportunities with pricing and dispatchable loads.

KEY ACHIEVEMENTS

The UBCO Skeena Residence completed in 2020 is on track to become the first passive house dormitory in Canada

- 6 story, 220-unit residence and UBC's first Passive House project, designed to the highest performance level of the BC Energy Step Code.
- Integrates leading-edge green building "Living Lab" research for UBCO faculty and green building innovation of provincial, national and international significance.
- Winner of CleanBC's Better Buildings Net-Zero Energy-Ready Challenge Construction and Design Incentive Award, in recognition of best practices in the early adoption of innovative low-carbon building design.
- Recipient of the Environmental Performance Award for the 2020 Wood Design Awards, Canadian Wood Council.



UBC Okanagan Skeena Residence

5.2.3 FLEET

UBC Okanagan fleet of vehicles and motorized equipment has the smallest impact on operational GHG emissions. Significant work has been undertaken by the campus to electrify fleet. This includes procuring hybrid electric vehicles, and rightsizing vehicles, including electric golf carts for on-campus travel.

UBC OKANAGAN-LED ACTIONS

Accelerated Actions (Start F2021-22)

- Planning and reporting on action related to UBCO's fleet is conducted through the provincially mandated Climate Change Accountability Report (CCAR) process. This process will include the continued pursuit of fleet optimization and efficiency for all fleet vehicles on campus.

5.2.3 FINANCIAL MECHANISMS: INTERNAL CARBON PRICING (ICP)

The global community is beginning to put a price on GHG emissions. As of 2018, 51 nations or subnational jurisdictions currently, or soon will, price carbon.²⁴ While there is growing agreement that carbon pricing is an effective tool to contribute to global action to reduce GHG emissions, this field is new and uncertain. Universities provide a space for innovation and open experimentation, and can offer research outcomes to industry and governments to inform future policy development.²⁵

Carbon pricing is seen as a key policy tool and a financial mechanism to address climate change. It works by incorporating the true costs of carbon pollution into the decision-making process. So far, external climate policy has lagged behind providing an actual representation of the costs of damages of climate change. To address these challenges, CAP 2030 proposes the introduction of an internal carbon price to better align financial decision-making criteria with UBC's climate goals and provide certainty, predictability, consistency and rigor for decision making. Unlike a carbon charge, the internal carbon price does not result in the exchange of money; it is simply used to inform decisions. The application of an internal carbon price can result in more money being invested initially in climate-friendly systems that reduce carbon dioxide emissions, however, it often saves money when factoring in the life cycle cost-benefits of the solution. UBC's internal carbon price represents an overall price ceiling, inclusive of all external pricing instruments, such as carbon offsets and fuel taxes. Internal carbon pricing has been successfully applied in higher education institutions to evaluate physical infrastructure decisions for energy conservation projects and capital planning and to offset university-sponsored air travel.

Accelerated Actions (Start F2021-22)

- The internal carbon price level of \$250/tCO₂e has been selected by UBC based upon carbon price escalation seen at the provincial and federal levels, which will reduce risks by helping to accurately account for the lifecycle cost during decision making.

UBC OKANAGAN-LED ACTIONS

Short Term Actions (By 2024) & Medium Term Actions (By 2030)

- Pilot the internal carbon price approach in lifecycle cost analysis for several energy supply, equipment renewal and energy conservation projects.
- Adapt UBC guidance documentation and supporting toolkit to help operationalize the carbon price analysis on campus.

²⁴ World Bank Group, "States and Trends of Carbon Pricing 2018," May 2018, World Bank, <https://openknowledge.worldbank.org/bitstream/handle/10986/29687/9781464812927.pdf?sequence=5&isAllowed=y> Page 8

²⁵ <https://secondnature.org/climate-action-guidance/i-why-price-carbon/>

5.3 EXTENDED IMPACT EMISSION REDUCTIONS

TARGET : **45% GHG emission reduction by 2030**

The overall target of 45% reduction from baseline has been identified to achieve the Paris Agreement 1.5°C target. This is in line with the mandate of the UBC climate emergency declaration.

The CAP 2030 is addressing extended impact areas for the first time, which are estimated to account for approximately 86% of all UBC Okanagan's emissions - significantly greater than campus operational emissions. While UBCO administration does not have direct control over its extended impacts, it has influence by creating the enabling infrastructure and policy levers to encourage, support and incentivize behaviour change. Achieving this will also require coordination with local governments, service providers, and vendors, further technology innovation and adoption, and working with businesses and stakeholders across various sectors. Most importantly, it will require strong buy-in and support from UBC's students, staff and faculty, who through their own personal choices have the most control over these emissions.

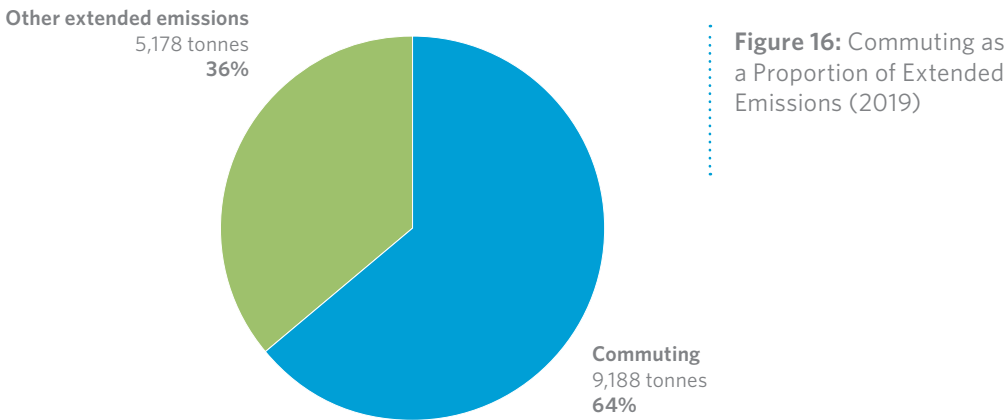
Additionally, many of the actions that relate to extended emissions are integrated actions with UBC Vancouver campus, and/or belong to specific units with their own strategic plans. For example, achieving the commuting GHG reduction target is entirely dependent on the successful implementation of all strategies in the UBC Okanagan Transportation Plan, and external dependencies with BC Transit, the Central Okanagan Regional District, and the City of Kelowna. Achieving the Climate Friendly Food targets will require UBC Vancouver's policy development leadership and support to implement shared lessons policies, and programs across the UBCO campus, as well as Okanagan actions led by staff locally.

Foundational CAP 2030 actions involve establishing measurement methods and monitoring protocols to enable the campus to make informed, strategic decisions in this area. It is acknowledged that foundational actions in new areas will be built on over the ten year plan trajectory, recognizing some require further study to understand associated costs and benefits. Below is a breakdown of extended impact emission reduction targets and actions by focus area.

5.3.1 COMMUTING

TARGET : **40% reduction in commuting emissions from 2013 levels by 2030.**

Accounting for approximately 9,322 tCO₂e (64%) emissions per year, commuting by staff, faculty and students to and from the UBC Okanagan campus is the highest extended impact emissions category (Figure 16). In 2019, over 8,800 daily trips were generated by people driving alone, which is 37% of all trips by all modes to and from campus. By 2040, under a medium growth scenario, this number could increase to nearly 14,200 trips by people driving alone.



The campus has several Transportation Demand Management (TDM) policies and strategies in place including the successful U-Pass program to encourage students to take transit, and the bike rental program with UBCycles and bike parking and end-of-trip facilities across campus to support cycling. There are also some unique TDM events that are held throughout the year to encourage sustainable trips including the annual commuter challenge, GoByBike Week, and virtual cycling workshops. However, there are few other TDM programs and services available to manage vehicle traffic and parking demands on campus.

There are opportunities for significant emissions reductions by decreasing commuting trips, shifting behaviours (to zero emission vehicles and to transit, walking and biking), and increasing transit capacity in the longer term. Climate justice also factors into development of transportation policies and programs, to ensure that equity across the UBC community is considered.

The UBC Okanagan Transportation Plan

The UBC Okanagan Transportation Plan, developed in parallel to the UBCO CAP 2030, serves as a high-level roadmap for meeting the transportation needs of the UBCO community through 2040. The UBCO CAP 2030 commuting GHG reduction target is based on modelling the emission reduction impact of strategies identified by the UBC Okanagan Transportation Plan (Figure 17). The analysis demonstrates the campus can achieve a 40% GHG emission reduction by 2030, if all strategies and actions in the Transportation Plan are successfully implemented over the next ten years.

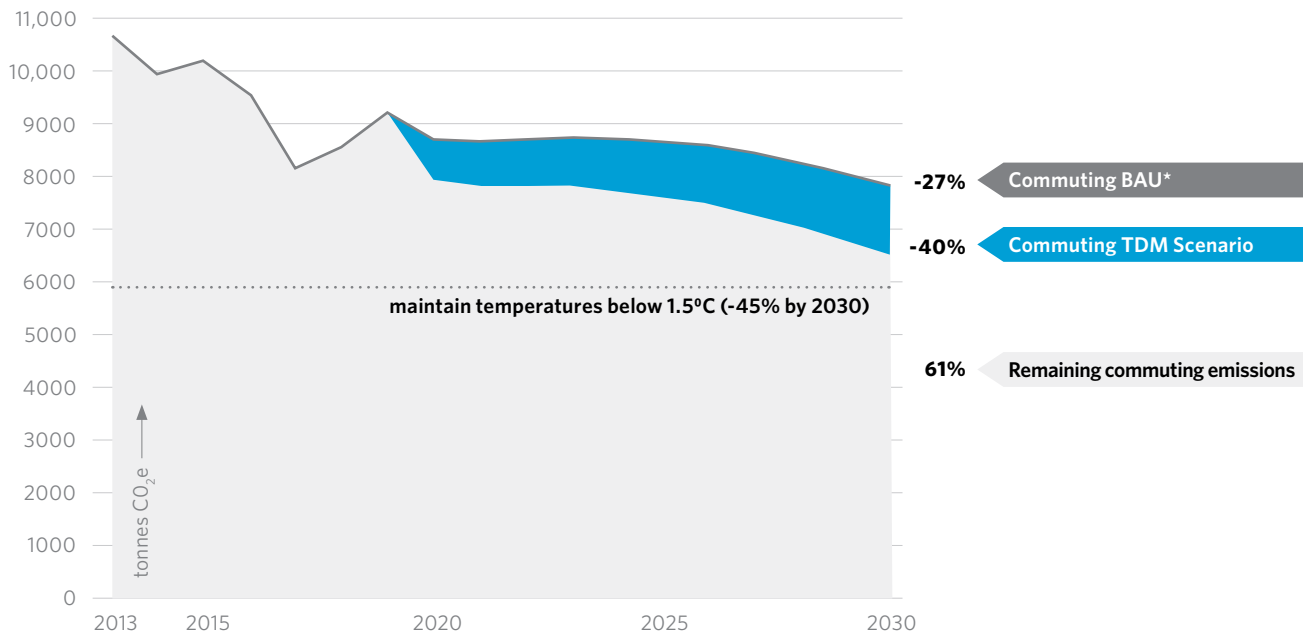


Figure 17: UBC Okanagan Campus Commuting GHG Reduction Scenario

* UBCO BAU assumes implementation of BC Transit's Low Carbon Fleet Program, the Provincial Zero Emissions Vehicle Regulation (30% of new vehicle sales are ZEV by 2030), and the Provincial Low Carbon Fuel Standard (gasoline in 2030 is 20% less carbon intensive than 2010)

UBC OKANAGAN-LED ACTIONS (REF: UBCO TRANSPORTATION PLAN)

Short Term Actions (By 2024) & Medium Term Actions (By 2030)

- Advocate for increased transit service levels and an expanded transit network to the City of Kelowna and BC Transit to increase transit ridership by the university community and reach the university's transit mode-share target.
- Directly influence transit ridership by attracting riders through incentive programs, education and awareness programs, and a transit pass discount program for staff and faculty.
- Develop policies, targets and tools that enable and support departments in incorporating teleworking, flex days and e-learning on an ongoing basis.
- Explore funding via a "Sustainable Transportation Levy" as part of parking permit fees to fund sustainable transportation initiatives including a Sustainable Transportation Program, that will support reductions in commuting emissions.
- Establish an ongoing Sustainable Transportation Program to deliver infrastructure, programs and initiatives that enable sustainable transportation choices and drive behavioural change to reduce commuting emissions.

- Continue to enable the widespread adoption of Zero Emission Vehicles by incentivizing their use and increasing the availability of EV chargers across campus.
- Update the current model of parking pricing on campus to manage parking demand and encourage a shift towards more sustainable transportation modes.
- Improve the cycling experience to support more cycling trips to and from campus, such as improved secure storage, working with government partners to provide dedicated bike lanes to/from campus and a joint bike/e-bike share program with the City of Kelowna.
- Provide a broader mix of housing, services and amenities on campus to eliminate commuter trips, encourage more travel by active modes, and enable a vibrant year-round campus community.
- Update campus parking supply requirements with the City of Kelowna to support the University's transportation related targets and adjust operations to meet demands from new technologies and services, i.e., ride hailing, car sharing, carpooling, etc.

KEY ACHIEVEMENTS

The John Hindle Drive and multi-use pathway corridor, and new housing in the Academy Hill area surrounding the campus has improved active transportation opportunities including walking, cycling, transit and new mobility options. Expansion of the transit exchange on campus has influenced travel behaviour by improving the transit experience for passengers and expanded capacity for future service expansion. UBCO sees this as an example of how strategies that support sustainable and convenient travel choices can be supported by the University with cost-effective investments in green infrastructure. The UBCO Transportation Plan presents an opportunity to assess up-to-date transportation conditions and identify areas to enhance multi-modal mobility to, from and around the campus.



5.3.2 FOOD SYSTEMS

UBC SYSTEM TARGET : **50% reduction in GHG emission reduction of food systems by 2030.**

Food systems are an enormous driver of climate change - from producing, transporting, and storing food, and decomposing wasted food, our food system contributes significantly to local GHG emissions. Attempts to quantify GHG contributions from food systems is emerging, and there are different methods used. At the Vancouver campus, it is estimated that food systems account for an estimated 29,000 tCO₂e per year. It is estimated as the second-highest extended impact emissions category following commuting and is anticipated to constitute a substantial share of emissions at the Okanagan campus.

UBC Okanagan is well positioned to lead an integrated approach in creating a just and resilient campus-wide food system. The campus has an active, long-standing Food Strategy Group with broad representation from students, academics and staff across multiple portfolios, responsible for tackling a broad scope of food-related issues ranging from food security to healthy, sustainable food options. The UBCO CAP Food Working Group formed from the Food Strategy Group to develop actions in this Plan. Subsequent work is ongoing to identify the highest UBCO GHG food impact areas on campus and opportunities to mitigate.

The campus is also supported by an in-house operation model of food service, extended to the UBC Okanagan campus in 2019, which aims to provide local and environmentally friendly food options. UBCO will lead many independent actions in this Plan to advance climate friendly food systems, and will also collaborate with the Vancouver campus and communities on system level actions critical for reducing emissions associated with food.



Okanagan Climate Friendly Food Dialogues: An Inclusive, Community-Engaged Approach

A series of highly attended UBCO food dialogues were developed and facilitated by the UBCO CAP Food Working Group. Over 150 campus community members gathered to learn the latest research evidence and other forms of knowledge, participants' opinions and experiences on topics related to climate friendly foods, wicked questions, and opportunity for immediate action. Outcomes of the dialogues were considered to inform the development of food and food waste actions in this Plan.

Actions outside the UBCO CAP 2030 will be advanced through parallel work including by the UBCO Food Strategy Committee. Examples include the launch of a UBCO Farmer's Market Pilot and leadership of the UBCO Student's Union to advance "Plant-Forward Diets" on campus.

KEY ACHIEVEMENTS

Opened in September 2021, the Pritchard Dining Hall 'all you care to eat' strategy eliminates all food waste and packaging by using exclusively reusable utensils and dishware.

Pritchard Dining Hall, Nechako
Residence & Commons Block



UBC SYSTEM-LEVEL ACTIONS (TAILORED TO UBC OKANAGAN)

Short Term Actions (By 2024)

- Develop and implement scaled Climate Friendly Food System Procurement Guidelines for UBCO Food Services dining locations. This will include alignment of third-party contract stipulations.
- Apply UBC Supplier Code of Conduct to reflect UBC's climate commitments when amended.
- Adopt campus-wide Climate Friendly Food System (CFFS) definition, mandatory CFFS labeling, and toolkit to increase sustainable dietary choices, offerings and habits, following UBC Vancouver's lead.

UBC SYSTEM-LEVEL ACTIONS (TAILORED TO UBC OKANAGAN)

Medium Term Actions (By 2030)

- Apply measurement and reporting of campus food systems environmental footprint, and coordinate with other food sustainability tracking priorities (adapt based on UBC Vancouver methodology).

UBC OKANAGAN-LED ACTIONS

Accelerated Actions (Start F2021-22)

- Perform systematic review of campus-wide food system procurement.²⁶

²⁶At the current time, measurement is extremely challenging due to the lack of data across supply chains. The purpose of this project is to help UBCO determine its highest food GHG impact areas and recommendations, leading into broader methodology for food emissions developed by the campuses.

UBC OKANAGAN-LED ACTIONS**Medium Term Actions (By 2030)**

- Foster partnerships to enhance community driven food procurement, security and transparency.
- Continue to advance zero food waste actions at the Pritchard Dining Hall Facility at the UBCO Nechako Residence and Commons Block.
- Develop and implement an evidence-based approach to food waste reduction on campus.

In addition to the action noted above, future consideration is being given to **extend food catering commitments to off-campus dining partners.**

5.3.3 BUSINESS AIR TRAVEL

UBC SYSTEM TARGET : **By 2030, Reduce Business Air Travel emissions by 50% from 2019 pre-pandemic levels.**

Business air travel is a significant source of extended impact emissions for the UBC Okanagan campus, accounting for approximately 3,528 tCO₂e/yr and equivalent to about 24% of total extended emissions. Figure 18 is likely an underestimation due to limitations on available data.

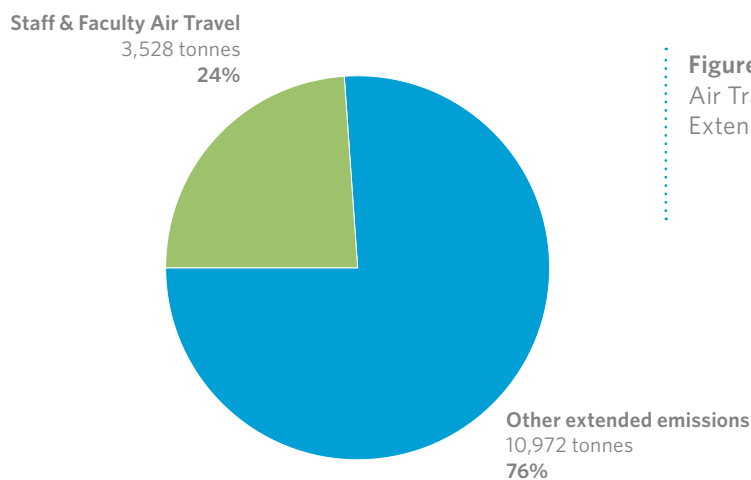


Figure 18: UBCO Business Air Travel as a Proportion of Extended Emissions (2019)

As one of UBC Okanagan's largest sources of indirect emissions, business air travel provides an opportunity for improvement. Pre-pandemic data available indicate that approximately 17% of this travel is for business between the campuses, and the remaining is to other destinations and to meet academic research requirements. The dependence of faculty and students on air travel to carry out certain types of research and scholarly projects is acknowledged, as well as dependencies between the campuses as it relates to system-wide activities.

The response to the COVID-19 pandemic holds important lessons on how to address climate change. Emissions from business air travel were dramatically reduced while UBC's mission to excellence in teaching and research was generally maintained. By leveraging recent learnings from the COVID-19 pandemic, including the availability of better communication technology solutions, it is anticipated that air travel can be reduced while providing an opportunity to maintain or improve UBC's educational and research objectives. This also increases access to educational opportunities for students and departments lacking means for engaging in extensive travel. Benefits such as cost savings for the university presents an opportunity to strategically reallocate those savings.

Reporting on business air travel is new for UBC, and as this work progresses, we will increase our understanding of the impact and the potential to realize the significant GHG emission and cost savings associated with this scope. Action on business air emissions will involve coordination and decision making across UBC that implicates air travel generally and air travel between the campuses. Improving UBC's tracking and reporting of GHG emissions for all business air travel will strengthen the imperative to act to reduce emissions from this sector. Generally speaking the UBC Okanagan campus often bears a somewhat disproportionate amount of "UBC System" travel. Identification and removal of barriers to choosing travel alternatives will be integral to shifting cultural norms, while ensuring an equitable approach.

UBC SYSTEM-LED ACTIONS (LED BY UBCV WITH IMPLEMENTATION SUPPORT PROVIDED BY UBCO)

Accelerated Actions (Start F2021-22)

- Initiate a Sustainable Travel Program to develop behavioural change programming and awareness campaigns around travel impacts and the increasing number of virtual alternatives available.
- Implement a study across both campuses to understand inter-campus air travel patterns, barriers and opportunities to reduce inter-campus air travel emissions. This action will enable UBC to better understand understanding why we travel between the two campuses and how our travel behaviours should ideally shift as we start to emerge from the COVID-19 pandemic travel restrictions.

UBC SYSTEM-LED ACTIONS (LED BY UBCV WITH IMPLEMENTATION SUPPORT PROVIDED BY UBCO)**Short Term Actions (By 2024)**

- Track and report GHG emissions and other key parameters for all UBC business air travel.
- Lead a coordinated approach to reducing air travel GHG emissions across the University ecosystem through the University Climate Change Coalition (UC3)

UBC OKANAGAN-LED ACTIONS**Accelerated Actions (Start F2021-22)**

- Continue to support technology such as Zoom and Microsoft Teams which provide virtual meeting and collaboration options.

5.3.4 WASTE AND MATERIALS

TARGET : 50% less waste per capita by 2030, progressing toward a zero-waste community

Waste material represents 3% of UBC Okanagan's extended impact emissions²⁷. It is comprised of operational and construction waste that has been disposed of at the landfill. Waste material removed from campus is tracked via operational waste weight reports provided by the campus' service provider. Construction waste is reported by project managers on a project-by-project basis, in line with minimum 75% waste diversion requirement for all projects.

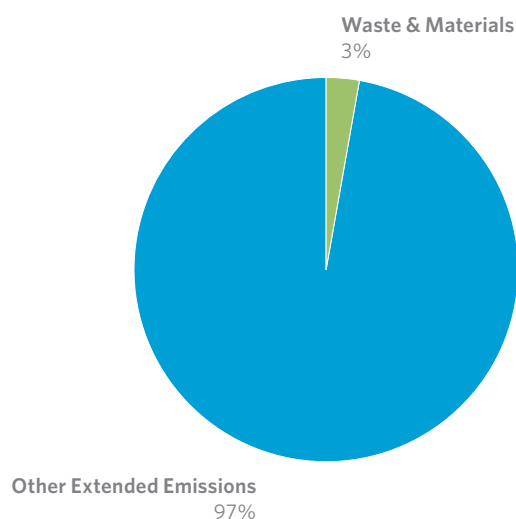


Figure 19: Detailed Emissions for Waste & Materials as a Proportion of Extended Emissions (2019).

²⁷ Waste emissions shown currently only include those from material disposed/landfilled, and do not include life cycle emissions which are much larger.

Solid waste disposal trends for the UBCO CAP 2030 analysis are based on historical data collected by UBC Okanagan. Waste emissions per population dropped 60% from 2013 through to 2020, with the majority of reductions occurring between 2013 and 2016. The business as usual forecast assumes that the average disposal rate over the last three years (41 kg CO₂e/capita for 2018-2020) continues through to 2030.

In 2020 the campus landfilled over 486 tonnes of operational waste and 167 tonnes of construction waste material. Landfill material risks soil, water and air pollution and creates the greenhouse gas methane (CH₄). This means almost a quarter of the 637 tonnes of overall operational material generated by the campus in the last year was sent to a recycling facility, and the remainder to landfill. A key priority of the UBCO CAP 2030 is to reduce waste on campus. In cases where this is not possible, many recycling programs already exist on the campus, including:

- Lab Plastics Recycling Program
- Rescue Paper Program
- Deskside Recycling
- Pipet Tip Box Recycling Program
- Composting
- Battery Recycling

UBC Okanagan is working in partnership with a third party to collect food waste and other organic material from campus to make chemical-free fertilizer and compost. The compost helps the soil to retain water, and helps reduce the use of non-organic fertilizer & soil amendments while helping companies and communities lower their GHG emissions. This supports Clean BC's target for 95% of organic waste to be diverted from landfills and turned into other products by 2030.

Achievement of UBC Okanagan's waste reduction target requires a coordinated effort across multiple units on campus including Student Housing, Facilities Management and Food Services. Actions to support food waste are therefore included in this section of the Plan.

UBC OKANAGAN-LED ACTIONS

Accelerated Actions (Start F2021-22)

- Identify and implement high impact Green Labs Programs that target waste reduction.
- Increase the volume of organics captured from the landfill and recycling waste streams.

UBC OKANAGAN-LED ACTIONS**Short Term Actions (By 2024)**

- Develop a UBCO section or compendium to the UBC Recycling Infrastructure Guidelines for UBCO Buildings.
- Increase community engagement and behavioural change initiatives to encourage personal responsibility for separation of waste streams.
- Apply/adapt UBC's sustainable procurement program that addresses vendor and product sustainability criteria, zero waste compliant packaging requirements, updated procurement guidelines and processes, and integration with the Integrated Renewal Plan.
- Maximize recycling to reduce waste to landfill.
- Expand re-use programs.
- Reduce volumes of waste on campus.

KEY ACHIEVEMENTS

[How to Sort It Out at UBC Okanagan](#) is a video educational series launched to support sorting compliance with recycling, returnable and compostable streams to keep materials out of the waste stream. The program was developed by geography students supported by the Campus Planning Sustainability Office, Facilities Management and Food Services. Creating a peer-to-peer educational tool to increase awareness of current waste and recycling issues and improve sorting compliance, the video has relevance to the campus community as a whole.



Sunshine Cafe Recycling Station

5.3.5 EMBODIED CARBON

UBC SYSTEM TARGET : **By 2030, establish an embodied carbon baseline and align new building and renewal designs with a 50% reduction target**

Buildings are currently responsible for 39% of global energy related carbon emissions; 28% from operational emissions, from energy needed to heat, cool and power them, and the remaining 11% from materials and construction.²⁸ As energy efficiency and the proliferation of low carbon systems reduce operational emissions, embodied emissions become a larger portion of the total environmental footprint of the building sector. Transitioning to truly net zero communities will require increased attention to the embodied environmental impacts of buildings.

Given UBC Okanagan's significantly low operational emissions and plans to decarbonize, it is becoming more important to take a lifecycle approach and address embodied emissions that arise from materials used to construct campus buildings, in addition to the energy emissions from operating buildings²⁹. Even when averaged over the lifecycle of the building, these emissions represent a significant share of all UBCO's extended impact emissions (at least 7% is estimated). Limiting new construction as far as possible represents the first step in limiting GHG emissions. The embodied energy of new buildings can be reduced by using materials which use less energy to produce and are made from natural and recycled materials.



The Hangar Fitness and Wellness Centre

UBC SYSTEM-LED ACTIONS (LED BY UBCV, REQUIRING INVOLVEMENT OF UBCO TO CO-DEVELOP/ADAPT)

Accelerated Actions (Start F2021-22)

- Develop clear guidance for embodied carbon Life Cycle Assessment (LCA) studies for new buildings and renewals, potentially including an early embodied carbon reduction target. The intent is to assess, reduce and report Embodied Carbon and provide data for future benchmarking.³⁰
- Develop guidance for reducing embodied carbon in buildings to discourage, reduce or potentially eliminate materials with the highest embodied carbon impacts.
- Update the method for campus level reporting on embodied carbon emissions in UBC's GHG inventory and carbon reporting.

²⁸ <https://www.worldgbc.org/embodied-carbon>

²⁹ Embodied carbon refers to the carbon dioxide (CO₂) emissions associated with materials and construction processes throughout the lifecycle of a building or infrastructure.

³⁰ Embodied carbon recommendations arising from the UBCO Interdisciplinary Collaboration & Innovation Building (ICI) project is anticipated to inform UBC's future policy and guidance towards the goal of lowering embodied carbon of the university's buildings.

UBC SYSTEM-LED ACTIONS (LED BY UBCV, REQUIRING INVOLVEMENT OF UBCO TO CO-DEVELOP/ADAPT)**Short Term Actions (By 2024)**

- Develop an embodied carbon target for UBC buildings by type and for the campus as a whole, for application on projects in 2025-2030.

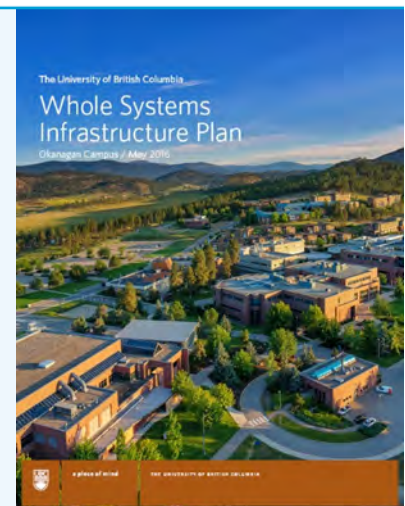
UBC SYSTEM-LED ACTIONS (LED BY UBCV, REQUIRING INVOLVEMENT OF UBCO TO CO-DEVELOP/ADAPT)**Medium Term Actions (By 2030+)**

- In addition to embodied carbon, consider healthy and equitably sourced materials/buildings as par of a holistic approach to building material choices.

KEY ACHIEVEMENT

The UBCO Whole Systems Infrastructure Plan (WSIP) (2016) led the way to demonstrate the significant opportunity of the campus to address embodied carbon emissions. The WSIP provides the first framework of recommended actions to reduce embodied carbon. This was incorporated into the Okanagan Campus Design Guidelines to guide low embodied carbon materials selection for new building projects.

UBCO Whole Systems Infrastructure Plan

**5.4 OUTREACH & ENGAGEMENT PROGRAMS**

UBC SYSTEM TARGET : By 2030, three quarters (75%) of UBC faculty, staff, and students will be aware UBC's climate action goals and participating in UBC's evolving and expanding culture of sustainability.

In addition to policy development that advances structural change needed for systemic emissions reductions, engagement and behaviour change is necessary to reduce extended impact emissions. With the inclusion of extended impact emissions targets in the UBCO CAP 2030, new and expanded communications and engagement capacity is required to drive the behaviour and social changes needed to reach this Plan's Paris Target-aligned goals for business air travel, commuting, food, waste, and embodied carbon in buildings.

A short-term action for the Okanagan campus, subject to resources, is a realignment of its existing behaviour change program with evidence-based high impact areas for reducing GHG emissions through behaviour change, which represent key areas of focus in this Plan. A new climate change awareness and education strategy is envisioned to support achievement of the emerging UBCO CAP 2030 targets focused on reducing Scope 1, 2 and extended impact emissions.

UBC SYSTEM-LED ACTIONS (LED BY UBCV, REQUIRING INVOLVEMENT OF UBCO TO CO-DEVELOP/ADAPT)

Accelerated Actions (Start F2021-22)

- Review/adapt UBCV's comprehensive plan to track, support, and (where needed) coordinate the implementation of CAP-related engagement and outreach communications, campaigns, and programming, in alignment with institutional action on the Climate Emergency Task Force priorities, Integrated Communications & Engagement (ICE) Plan, and CAP 2030 scope 1, 2 and 3 emissions reduction actions.
- Co-develop/adapt UBCV's climate action communications, engagement and outreach model (supporting awareness-building and education as well as social and behavioural change) for both targeted and campus-wide audiences.
- Coordinate with Vancouver colleagues and Okanagan lead units to adapt cross-campus climate action campaign management model for university-wide CAP 2030 campaigns to strategically guide engagement and outreach campaign implementation at the UBCO campus.

UBC SYSTEM-LED ACTIONS (LED BY UBCV, REQUIRING INVOLVEMENT OF UBCO TO CO-DEVELOP/ADAPT)

Short Term Actions (By 2024)

- Adapt new and expanded sustainability engagement and outreach programs, tools and resources, ensuring adequate and ongoing resourcing to amplify engagement on climate action at the UBCO campus.
- Apply standardized university-wide process for portfolios, faculties and/or departments to track, measure and report out on UBCO CAP 2030 participation and progress.

UBC SYSTEM-LED ACTIONS (LED BY UBCV, REQUIRING INVOLVEMENT OF UBCO TO CO-DEVELOP/ADAPT)**Medium Term Actions (By 2030+)**

- Collaborate, where possible, on UBCV's (existing and additional) funding opportunities to support innovative sustainability initiatives driven by faculty, students and staff (i.e., AMS Fund, Workplace Sustainability Fund, Green Labs Fund, Sustainability Revolving Fund, building-based energy-savings projects to benefit lab environments).
- Develop ways to ensure that climate action is an important aspect of every employee's work, where relevant – such as integration within performance metrics, job descriptions, etc.
- Identify and utilize price signals to incentivize GHG reduction behaviours (i.e. transportation, business air travel, waste, etc.)

UBC OKANAGAN-LED ACTIONS**Accelerated Actions (Start F2021-22)**

- Develop UBCO community engagement/behavioural change strategies for climate action based on lessons learned from COVID-19.

UBC OKANAGAN-LED ACTIONS**Short Term Actions (By 2024)**

- Building from the Power of You program, develop new and expanded climate and sustainability communications and engagement programs for high impact audiences to amplify climate action engagement at the UBCO campus.

KEY ACHIEVEMENT

2020 resulted in a number of shifts in campus behaviours with environmental benefits. Reduced commuting, air travel, and building occupancy resulted in the development of new communications and campus engagement methods targeting the maintenance of sustainable behaviours. Virtual webinars promoted cyclist safety and future bike to campus opportunities. Campus community participation in on-line presentations, “public open houses” and surveys informed many of the recommendations in this Plan, including actions to reduce GHG emissions from air travel, commuting and food.



Power of You Volunteer Group

5.5 ADAPTATION, RESILIENCE & BIODIVERSITY

The UBC Okanagan campus is located in the ecological setting of the Okanagan Very Dry Hot Ponderosa Pine zone, which represents the driest woodland regions in BC, with hot, dry conditions in summer and cool conditions with little snow in winter. At least 25% of the campus has high environmental sensitivity, representing primarily woodland and wetland ecological communities. With a diverse landscape of pine woodland and open grassland, the campus contains ecosystem communities of plants and wildlife identified as being species at risk.

Addressing climate and ecological crises simultaneously is critical to adequately adapt to climate change. Natural assets are also part of a holistic suite of solutions that can contribute to reducing GHG emissions to achieve both mitigation and adaptation objectives, and co-benefits to campus ecology (e.g., shading of buildings to reduce cooling energy loads, and carbon sequestration via trees and vegetation).



Arrow-Leaf Balsamroot, UBC Okanagan

UBC Okanagan's current climate adaptation planning and activities include;

- [Skeena Residence \(Passive House Project\)](#) - Rigorous efficiency standards, climate & thermal comfort modeling
- [Integrated Rainwater Management Plan \(2017\)](#) - stormwater modelling using predicted climate change to provide infrastructure resiliency and achieve 100% diversion of rainwater from municipal system. Demonstrates best practice in green infrastructure and low impact development.
- [Whole Systems Infrastructure Plan \(2016\)](#) - climate sensitivity analysis for energy and carbon reduction measures; landscape, ecology and biodiversity actions and proposed performance indicators
- [UBC Okanagan Campus Design Guidelines \(2019\)](#) - Green Buildings, Climate Adaptive Design
- Campus Environmental Sensitivity Areas Mapping and species at risk protection best management practices (ongoing)
- Annual Climate Risk Survey as part of Provincial Climate Change Accountability Reporting requirements.

UBC OKANAGAN-LED ACTIONS

Driven by local conditions, recent climate events and rapid regulatory changes, UBC Okanagan will need to incorporate climate adaptation, resiliency and biodiversity considerations into campus planning and operations. Failing to adequately consider and manage risks from climate change will cost significantly more than implementing proactive management of these risks.

UBC OKANAGAN-LED ACTIONS**Accelerated Actions (Start F2021-22)**

- Develop procedures and protocols for facility managers in response to increased summer temperatures, decreased outdoor air quality/wildfire smoke for new and existing buildings (e.g., implement CO₂ sensors in air handler units as a proxy for Indoor Air Quality Monitoring, implement automated smoke mitigation operational sequences to reduce amount of indoor air when critical thresholds reached).
- Amend UBCO Technical Guidelines to perform thermal comfort modeling of new buildings based on 2050 climate files.
- Undertake a Multi-Hazards Assessment to identify the main hazards and vulnerability facing critical campus infrastructure, teaching and research continuity.
- Continue to implement Low Carbon Energy Strategy – the District Energy Centralized Plant(s) provide the ability to increase cooling capacity (energy supply side) and resiliency for future climate needs more cost effectively.
- Continue to implement and build on campus-scale water, ecological landscape and biodiversity recommendations in UBCO’s Whole Systems Infrastructure Plan to restore and enhance the ecological landscape, promote biodiversity and climate resilience.
- Review and plan to update existing guidelines and plans that support climate adaptation and resiliency (e.g., wildfire plans).
- Tailor, expand and implement UBC’s Climate Ready Building Requirements for new construction at the Okanagan campus.

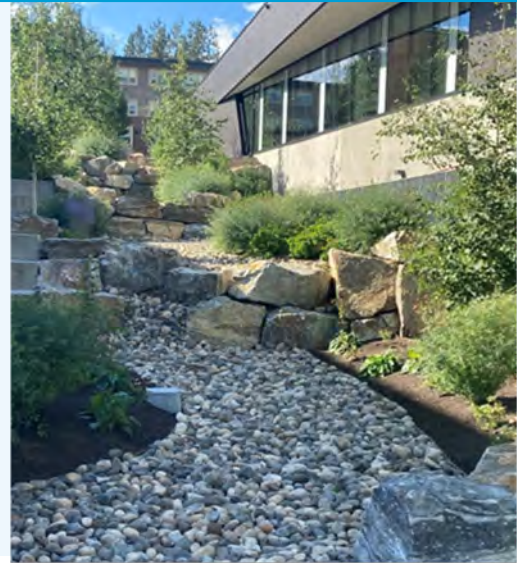
UBC OKANAGAN-LED ACTIONS**Short Term Actions (By 2024)**

- Develop a Climate Adaptation, Resiliency and Biodiversity Strategy Campus Plan that is an "umbrella" strategy that incorporates other related UBCO plans, policies and initiatives and establishes indicators of campus climate resilience. Incorporate specific actions to maintain and enhance campus ecology and biodiversity as a tool for climate adaptation.
- Update the UBCO Integrated Rainwater Management Plan to respond to future campus growth anticipated by the Campus Plan (2015) update.

KEY ACHIEVEMENT

Climate adaptation planning at UBC's Okanagan campus is fundamental to address climate change risks. Climate modelling is an integral component of rain water modelling flows and volumes to responsibly manage rainwater at with future campus development, through the UBCO Integrated Rainwater Management Plan. This Plan assesses and proposes rainwater retention targets to responsibly manage 100% of the rainwater that falls on campus, to the impacts of the built environment on rainwater management, while supporting the natural hydrological cycle, habitat and social amenity.

Nechako Residence & Commons Block Rainwater Garden



6. Plan Implementation

6.1 DISTRIBUTED LEADERSHIP APPROACH

The CAP 2030 is a UBC-wide effort across both the Okanagan and Vancouver campuses, and will require leadership and resourcing from many units across both campuses. This distributed leadership approach embeds the ownership and accountability needed to mobilize the magnitude of effort required to act on climate change across the organization. This approach also builds cross-organizational capacity required for systems change.

The distributed leadership model integrates concurrent work into this Plan, enhances mobilized resources across campuses, and embeds ownership and accountability for delivering on this Plan across the organization. Table 4 highlights where this Plan's actions are originating, who is leading, who is supporting, and where additional resources may be required. Implementation resourcing requirements will be revisited annually.

UBCO CAP 2030 Plan – Distributed Leadership Approach			
Area	Policy Level Actions Being Developed for UBC	Okanagan Led Actions	Okanagan Support of Policy Level Action
Commuting		■	
Business Air Travel	■		□
Buildings & Energy		■	
Food	■	□	□
Engagement and Outreach	■	■	■
Embodied Carbon	■		□
Financial Tools	■		□
Waste & Materials		■	
Fleet		□	
Adaptation & Resiliency (Next Phase of CAP)		■	
CAP Plan Implementation - Coord/Facilitation		□	

■ : Require additional resources to implement

■ : Additional scoping of resource requirements is needed

□ : Short-term actions are currently absorbed within existing resources - to be revisited annually

Table 4: UBCO CAP 2030 Plan – Distributed Leadership Approach

6.2 PLAN IMPLEMENTATION PROCESS

Informed by a distributed leadership approach, implementation of the actions in this Plan will follow three concurrent pathways.

PATHWAYS

01

Implementation of Key Okanagan Plans: The success of this Plan is contingent on implementation of a number of key plans and actions under various leads. The Low Carbon Energy Strategy and Strategic Energy Management Plan (2021-2030+) are key initiatives that will enable this Plan to achieve its operational GHG emission reduction target. The successful implementation of strategies outlined in the UBCO Transportation Plan 2021 (2021-2030+) will provide the pathway to achieve this Plan's extended impact emission reduction target for commuting.

02

Okanagan-Specific CAP Actions: For emissions related to food systems and waste, immediate (now), short (by 2024) and medium term (by 2030) actions have been identified by Okanagan lead and support units for implementation. Okanagan's leadership, and in some cases, Okanagan's ability to implement Vancouver's policy leadership, will move us towards achieving the targets set out in this plan.

03

UBC System-Level Policies and Actions: Vancouver, with Okanagan input, will lead policy development in the CAP areas that apply to UBC as a system - air travel, embodied carbon and financial tools. For air travel and financial tools, staff capacity for implementation on the Okanagan campus is required. Other system level actions such as embodied carbon will rely on Campus Planning staff time for input and coordination on both campuses.



6.3 RESOURCING THIS PLAN

6.3.1 RESOURCING CAMPUS OPERATIONS EMISSION REDUCTIONS

The UBCO CAP 2030 establishes high-level targets, policies and actions that guide projects and investments to achieve this Plan's vision. Resources are required to implement the majority of actions in this Plan over the next ten years. Until now, accomplishments to reduce campus operational emissions have been largely the result of regular allocations of annual operating budget funding and,

- Existing routine capital funding – deferred maintenance, equipment replacement, building renewals
- New building design / district energy expansion
- Partnerships and Grants (e.g., FortisBC grants and rebates for energy conservation measures, Energy Specialist position, behavioural change programs)
- No or low-cost actions (e.g., Technical and Design Guideline Updates)
- In-kind staff, faculty and student time

KEY ACHIEVEMENT

In the past two years alone, the campus has received more than \$240,000 in rebates from FortisBC for installing the chiller, as well as boiler upgrades, LED lighting, ventilation and heat recovery. In total, an annual energy savings of 1,900 gigajoules of natural gas and 1,333,500 kilowatt-hours of electricity are projected for these projects, which results in a total annual dollar savings of approximately \$131,000 for UBCO.

UBCO Engineering, Management, Education Building



Achieving the bold vision and aggressive GHG emission reduction targets in the UBCO CAP 2030 will require significant effort from across the university, and a focus on high impact investments in innovative low carbon projects and programs. These necessary investments may require strategic allocation of resources in the context of competing university priorities. However, increasing levels of capital investment in the short-term will help to reduce UBC Okanagan's carbon liability in the medium and longer term.

The estimated operational carbon liabilities to the Okanagan campus from already-announced policy to 2030 is anticipated to reach over \$500,000 annually by 2030, for a cumulative total over \$3 million (from 2021-2030) if no new actions are taken.³¹ Investments in clean solutions will be needed to offset this financial liability. Investments will also serve to protect and future-proof buildings, infrastructure and assets to the impact of climate change that are already occurring, and to build resilience.

Through the UBCO CAP 2030 process, key studies and detailed business case analysis have been completed for operational emission reduction actions requiring larger capital investments. This includes investments required over the next ten years to advance decarbonization of buildings and energy supply options to meet this Plan's operational GHG reduction target. These investments will not only mitigate GHG emissions, they are critical to reducing the campus' carbon offset liability, and provide resiliency against rapid shifts in commodity pricing, and future renewable energy supply options. Just as importantly, without continued aggressive action and investment, UBC Okanagan will jeopardize its leadership role on climate action, and forego the research and reputational benefits this brings.

6.3.2 RESOURCING EXTENDED IMPACTS

In contrast to campus operations emissions which are generally addressed through capital investments, extended impacts emission reductions will be driven by policy, procedures, process implementation, and programs aimed at achieving behaviour change in the UBC Okanagan community. This, in combination with the fact that many emission reduction opportunities of 'low-hanging fruit' are still available, means that in contrast to campus operations emissions, resourcing needs in this area are lower and will be in the form of human resources, administrative, or program funding.

The Okanagan campus has relied largely on 'in-kind' staff/faculty time and existing resources to develop actions in this area. Quick-start actions have been initiated to reduce emissions from high impact and high visibility areas including food systems, commuting and waste. Investment in these programs and emerging evidence-based behaviour change approaches will need to continue and expand to support achievement of this Plan's targets.

6.3.3 RESOURCING STRATEGY APPROACH

Continued development, prioritization and refinement of cost estimates and investment needs will be required to support this Plan's implementation over the next ten years. Consideration will need to be given to the urgency to fund future policy work required to advance UBC Okanagan's action in key high impact areas such as climate adaptation and resiliency of our campus.

In the near term, it is anticipated that specific resourcing requirements to implement high impact actions in this Plan will come forward under UBC's budget review process. Appendix D – Resourcing Strategy, provides an outline of recommended resourcing approaches as guidance for lead units responsible for the planning, resourcing and implementation of this Plan's actions, required to achieve the level of ambition in this Plan.

³¹ The carbon liability estimate assumes that UBCO continues to purchase offsets at \$²⁵ per tonne CO²e (under the provincial carbon neutral public sector initiative), and that the carbon tax increases annually by \$¹⁵ per tonne CO²e, reaching \$¹⁷⁰ per tonne CO²e by ²⁰³⁰ (under proposed federal carbon tax).

6.4 PLAN MONITORING, EVALUATION & REPORTING

Monitoring, evaluation and reporting of progress to implement actions in this Plan is required to ensure that the campus meets its climate action commitments through demonstrated progress. This will enable adjustment and continuous improvement in response to changing conditions and policy directions that may influence the campus' climate actions over the next ten years. Monitoring will be facilitated through a Unit Accountability Framework.



6.4.1 UNIT ACCOUNTABILITY FRAMEWORK

The Unit Accountability Framework provides a mechanism for UBC Okanagan units to report on their progress and achievements towards the UBCO CAP 2030 Board-approved targets. The Framework is similar in concept to BC's Public Sector Climate Change Accountability Reports, which public sector organizations (PSOs) including UBCO develop and submit to the Province annually to report on progress toward carbon neutrality.

Departments or business units that are leading or playing significant roles in actions identified in this Plan will be asked to annually provide information to the Campus Planning Sustainability Office on implementation progress. Implementation timelines may be adjusted based on resource availability, and support will be provided by the Campus Planning Sustainability Office. Detailed information is provided in Appendix E.

6.4.2 PERFORMANCE MONITORING & REPORTING

Informed by the Unit Accountability Frameworks, the Campus Planning Sustainability Office will conduct overarching campus climate action performance monitoring and reporting, in alignment with existing campus sustainability and climate reporting systems and requirements. Performance monitoring will provide the campus with an opportunity to assess its overall impact and adjust as needed. Updates to methodology for extended impact emissions (Scope 3) will be developed and incorporated into UBC Okanagan's performance monitoring and reporting process.

Performance monitoring will include the development of an annual UBCO CAP 2030 Progress Report built from Unit Accountability Reports. The Report will document the campus' implementation progress, status of actions and key performance indicators. Annual reports will be provided to the UBCO Sustainability & Climate Steering Committee (proposed). Detailed reporting timelines will be established as the timing of requirements are made available.

6.4.3 PLAN AMENDMENTS AND UPDATES

This Plan sets out actions for the Okanagan campus to meet Board approved 2030 GHG reduction targets. However, this plan is one step on the path toward the 2050 net positive target. 2030 will mark another milestone in assessing progress. 2025 is recommended as an appropriate timeframe to undertake a comprehensive review and update of the UBCO CAP 2030, including developing interim GHG reduction targets for the period between 2030 and 2050 for approval by the Board of Governors, and involving the campus community in consultation.

In order to meet the University's ambitious and challenging goals and targets for 2030 and beyond, strategic oversight and guidance for this Plan's implementation will be led by the UBCO Sustainability and Climate Steering Committee and UBCO Leadership Council. Regular check-ins will ensure progress is being made leading up to Plan updates.

All major amendments to the UBCO CAP 2030 will require approval by the Board of Governors, with any significant changes triggering public notification and public consultation per UBC Campus and Community Planning Engagement Principles.

7. Glossary

Alliance of World Universities (U7+): An international alliance of university presidents to engage in discussions and concrete action and commitments to address the most pressing global challenges in a multilateral context.

Business as usual (BAU): Refers to a situational context or scenario that does not undergo any change; a scenario where no climate action is taken.

Campus operations emissions: Campus emissions from sources directly controlled and operated by UBC, inclusive of emissions directly controlled and operated by UBC (Scope 1), and upstream emissions from electricity consumed on campus (Scope 2).

Carbon Dioxide (CO₂): A naturally occurring gas (0.03% of atmosphere) that is also a by-product of the combustion of fossil fuels and biomass, land-use changes, and other industrial processes. It is the principal anthropogenic greenhouse gas. It is the reference gas against which other greenhouse gases are measured and therefore has a Global Warming Potential of 1.

CleanBC: A plan developed by the British Columbia provincial government that sets 2030 climate goals through energy and industry emission reduction innovations and initiatives.

Climate Action Plan (CAP): A framework that provides a pathway to net zero emissions for the Okanagan campus by 2050.

District Energy System: District energy systems produce steam, hot water or chilled water at a central plant and distribute it to buildings to provide space and water heating and/ or cooling. UBC Okanagan's DES uses hot water to provide space and water heating to over 130 connected buildings.

Embodied Carbon: Embodied carbon refers to the carbon dioxide (CO₂) emissions associated with materials and construction processes throughout the lifecycle of a building or infrastructure.

Extended impact emissions: Campus emissions that UBC does not directly own or control, that are indirect impacts created through University activities that UBC can influence through behaviour change programs and sustainable supply chain procurement guidelines. These are emissions generally referred to as scope 3 emissions that includes commuting, business air travel, food, waste, and building materials.

Green Buildings Plan: A document that outlines what actions a jurisdiction will take to decrease the negative environmental impacts and maximize environmental, health and other aspects of its buildings. The Climate Action Plan 2020 identified the development of a comprehensive Green Buildings Plan as a strategy the university may pursue to support its GHG emissions reduction targets. Currently, UBC has a number of green building initiatives, including the UBC Sustainability Process, Residential Environmental Assessment Program (REAP), Building Tune-Up, UBC Renew and Bird Friendly Design Guidelines for Buildings.

Greenhouse Gas (GHG) emissions: Gases emitted from fuel combustion and other sources, that contribute to the greenhouse effect and global warming. This includes carbon dioxide, methane, nitrous oxide, ozone, and chlorofluorocarbons.

Heating, Ventilation and Air Conditioning (HVAC): The system and technology of heating and cooling of buildings through heating, ventilation and air conditioning.

Integrated Renewable Program (IRP): An integrated platform for UBC's Finance, Human Resources, and Student administrative processes and system environments with Workday.

Greenhouse Gas Intensity (GHGI): A measure of the emissions intensity of a building's emissions, measured and expressed in tonnes or kilograms of carbon dioxide equivalent per unit area over the course of a year (kg CO₂e/MT/year).

Life Cycle Assessment (LCA): A systematic analysis of the potential environmental impacts of products or services during their entire life cycle.

Renewable natural gas (RNG): A biogas (or biomethane) that results from bacteria breaking down organic waste from sources such as landfills, agriculture and wastewater treatment facilities, and is upgraded to a quality similar to fossil natural gas. Because of its biological source, it is considered a carbon neutral energy source.

Right size: Sizing and designing infrastructure, systems or equipment so that it is correctly aligned with end use requirements. Typically, this includes avoiding over-designing.

Tonnes of Carbon Equivalent (tCO₂e): The universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. Expressing all GHGs in terms of tonnes of CO₂e allows the different gases to be aggregated. The GWP of CO₂ equals one. Methane or CH₄ has a GWP of 25, indicating that its radiative forcing is 25 times that of CO₂. In other words, releasing one tonne of CH₄ will have the same warming impact as releasing 25 tonnes of CO₂. This impact is often expressed using the concept of carbon dioxide equivalent, or CO₂e: that is, one tonne of CH₄ can also be expressed as 25 tonnes of CO₂e.

Total Energy Demand Intensity (TEDI): A measure of the amount of annual heating energy needed to maintain a building's stable interior temperature.

Total Energy Use Intensity (TEUI): A provides a measure of a building's total energy use, including both "process" and "regulated" loads, per meter of building area per year.

University Climate Change Coalition (UC3): A coalition of North American research universities committed to climate action and cross-sector collaboration to accelerate local climate solutions and build community resilience.

8. Acknowledgements

UBCO CAP 2030 STAKEHOLDER ENGAGEMENT (OKANAGAN WORKING GROUPS & TARGETED CONSULTATIONS)

PROJECT DIRECTION AND OVERSIGHT

- UBC Okanagan Whole Systems Steering Committee (Okanagan/Vancouver Leadership & Okanagan Faculty Representation) with presentations to Okanagan Leadership Council, Deans' Council, Academic Building & Resources Committee, Okanagan Senate

PROJECT MANAGEMENT

- Campus Planning, Sustainability Office

CONSULTANTS

- Pinna Sustainability Inc.

UBCO AVP FINANCE AND OPERATIONS

- Business Operations
 - Food Services
 - Student Housing and Hospitality Services
- Campus Operations & Risk Management
 - Custodial and Waste Services
 - Energy Team
 - Facilities Management
 - Health, Safety and Environment
- Campus Planning
- Finance
- Information Technology Services
- Infrastructure Development
- Integrated Planning and Budget Office

UBCO AVP STUDENTS

- Health & Wellness
- Aboriginal Programs & Services
- Athletics & Recreation Services

AVP Campus & Community Planning

- Sustainability and Engineering
- UBC CAP 2030 Working Groups
- Social Ecological Economic Development Studies (SEEDS)

UBCO Research and Innovation

- Business Development Indigenous Community Engagement (Mitacs)

UBCO Students' Union Executives & Key Staff

UBCO Faculty Members from:

- Faculty of Arts and Social Sciences
 - Community, Culture and Global Studies
- Faculty of Health & Social Development
- Faculty of Management
- Faculty of Science
 - Computer Science, Mathematics, Physics, and Statistics
 - Earth, Environmental and Geographic Sciences
- School of Engineering

UBCO Okanagan Students



THE UNIVERSITY OF BRITISH COLUMBIA

UBC Okanagan Campus Planning, Sustainability Office

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