Executive Summary

PATHWAY TO A NET POSITIVE CAMPUS

The University of British Columbia’s (UBC’s) Green Building Action Plan (GBAP) outlines a holistic pathway for academic and residential buildings at the UBC Vancouver campus to advance towards making net positive contributions to human and natural systems by 2035.

The GBAP plays a key role in pursuit of an exceptional built environment, one that will support the academic mission of teaching, learning and research and contribute to our sustainability goals on the academic campus and within residential neighbourhoods.

To implement the GBAP a series of goals, targets and actions have been developed that will direct staff to work towards achieving the GBAP vision: By 2035, UBC’s buildings will make net positive contributions to human and natural systems.

THE SCOPE

The scope of the Green Building Action Plan covers institutional buildings on academic lands and residential and mixed use buildings in neighbourhoods at the Vancouver campus. Currently, on this campus, UBC owns and operates over 342 institutional buildings, and its residential neighborhoods house 12,000 people in 73 multi-unit residential and mixed-use buildings. UBC is growing rapidly, and it is expected to significantly increase the number of new building projects and existing-building retrofit projects over the next 20 years. How these buildings are designed, constructed and operated will have significant impact on sustainability of the campus and the wellbeing of the people who study, work and live there. The GBAP is intended to provide guidance to ensure the design and construction of new buildings, renovations and retrofits achieve higher levels of performance that advance toward the net positive goal for human and ecological wellbeing and lower total cost of ownership for UBC.

1 With an area of over 500m².
PLAN STRUCTURE AND COMPONENT AREAS

For both institutional and residential buildings, the GBAP provides ambitious goals, targets and actions in eight distinct but interrelated component areas: energy, water, materials and resources, biodiversity, health and wellbeing, quality, climate adaptation, and place and experience. The component areas represent an integrated approach to building design which promote whole systems thinking and leverage multiple benefits for single investments. Incremental improvements in each of these component areas will advance UBC towards a net positive campus.

In order to achieve the goals and targets in each of the component areas, a series of actions for UBC planning and operations staff are outlined with a delineation of roles and responsibilities across departments that were defined through consultation. The actions follow a structured cycle of research, benchmarking, piloting, implementation and monitoring to help inform policy and enable continuous improvement of UBC buildings.

In its ongoing work to advance sustainability and green building on campus, UBC has already progressed in some component areas, particularly energy, water, quality and some aspects of materials and resources. This progress has been integrated into existing policies and will be further advanced through the GBAP. However, other component areas such as biodiversity, materials and resources, climate adaptation, and health and wellbeing are emerging in nature. These component areas require foundational work to determine best practices to address the challenges and opportunities in an effective manner.

The Green Building Action Plan is based on a holistic approach which recognizes that energy efficiency and climate adaptation are priority considerations at UBC. Building energy efficiency has long been a focus at the University, and through the GBAP, further improvements in long-term cost savings and reduced greenhouse gas emissions will be achieved. The impacts associated with climate change on buildings are becoming more pressing with long term warming, more extreme weather events and changing precipitation patterns. Climate adaptive design is now recognised as an important direction for sustainability policy and green building at UBC. By integrating climate adaptability and resilience into the built environment, UBC will prepare for the climate impacts of rising temperatures and increased extreme weather events while generating co-benefits across component areas such as health and wellbeing.

Operations Linked to Teaching, Learning and Research

The Green Building Action Plan provides an opportunity to harness expertise not only from various operational units but also from academic research. Teaching, learning and research opportunities have been identified within the GBAP’s framework to help frame policy and investigate technical issues and large scale challenges such as climate change. Additionally, through the Campus as a Living Lab approach, UBC provides unique opportunities for academic engagement with buildings via the processes of planning, design, construction and operations which can help provide innovative operational solutions.

Policy and Process

Key to implementation of the GBAP is UBC’s unique governance; the University has powers through the Board of Governors to manage the development and operation of campus buildings, landscapes and infrastructure. This form of governance allows for the implementation of forward looking plans such as the GBAP.

The Green Building Action Plan works across different scales, from building to district, in conjunction with other UBC plans that together support UBC’s strategic goals. The implementation of the GBAP will be informed and complemented by these other UBC plans, such as the Campus Plan and Climate Action Plan, as well as relevant provincial and federal policies. At the same time, the GBAP will provide direction to future UBC policies.
Academic building development is guided in a significant way by the Vancouver Campus Plan. The Campus Plan Design Guidelines, which integrate sustainability best practices, will need to be reviewed and updated in the next amendment to align with the Green Building Action Plan goals in all component areas.

Existing building renovations and retrofits offer a significant impact in terms of achieving the goals of the GBAP because of the extent of the existing building stock. The GBAP clarifies performance targets and expectations for the renovation and retrofit of existing buildings.

The UBC Technical Guidelines will be the major guiding document to ensure that GBAP objectives for institutional projects are met in all component areas. These guidelines were created to ensure the quality and performance of design, construction, renovation and retrofit of institutional buildings, landscape and infrastructure. Since the guidelines are updated annually, this provides an opportunity to ensure annual integration and alignment with the GBAP.

All new campus construction and renewals at UBC are currently mandated by the Province of BC to be LEED Gold certified. Over the timeframe of the GBAP, necessary updates to the UBC LEED Implementation Guide and consideration of alternative certifications that align with UBC policy objectives (for example, Passive House and Well Building Standard certification) will be pursued.

The Sustainability Process, which supports an integrated design process for institutional building projects, was introduced in 2013 to ensure more consistent integration of sustainability measures and to ensure key design disciplines are brought together to achieve a high level of sustainability performance in a streamlined manner. Integrated design is critical for the success of the GBAP to encourage whole-systems thinking early in the design process.

The Major Project Delivery Process at UBC is currently finalizing improvements. A priority action for the GBAP is for better integration of the Sustainability Process into the overall Major Capital Project Development Process in support of a more streamlined process for proponents.

Some areas of policy are emerging and will become integrated with policy over the life of the GBAP. In the areas of biodiversity, health and wellbeing, and climate adaptation, individual policies will be developed that will provide direction to and be informed by the GBAP.
Neighbourhood plans govern development of UBC’s campus residential areas. The plans establish specific requirements for the form of building development, density, park space, recreation and transportation land use, all consistent with UBC’s Land Use Plan. Future neighbourhood plans at UBC, such as Stadium Road2 and Acadia Park, will reflect the requirements set forward in the GBAP.

The Residential Environmental Assessment Program (REAP) is a UBC-specific green building rating system that applies to multi-unit residential buildings. REAP building requirements support the movement towards a net positive position—and a reduction of environmental impact at the building site and neighbourhood scales—incrementally, over time. All new residential projects, including private developments and rental housing, are required to achieve a minimum REAP Gold certification. The GBAP proposes four amendments to REAP: REAP 3.1, REAP 3.2, REAP 4.0 and REAP 4.1.

REAP 3.1 is intended to apply to Wesbrook Place neighbourhood and refines measures that reduce energy demand at the building scale while pursuing low-carbon energy supply through the Neighbourhood District Energy System (NDES). Electric vehicle charging station requirements will also be updated to further support the use of zero-emission vehicles. The main purpose of this update is to align REAP with the British Columbia Building Code Energy Step Code (BC Energy Step Code). Enacted in 2017, the BC Energy Step Code allows municipalities to mandate the incremental steps of the code in regulations if they wish to require higher performance than code. Although UBC is not technically a municipality, Campus and Community Planning has determined that the best approach, legally and politically, is to align REAP energy credits with the BC Energy Step Code to ensure consistency with the rest of the province.

REAP 3.2 will update the weighting of impact areas within REAP (for example, energy, water, materials and resources, or innovation) to align with UBC’s current policies. REAP 4.0 will be in place for the Stadium Road neighbourhood, and it will fine-tune energy requirements and add credits for health and wellbeing, climate adaptation and biodiversity. REAP 4.1 is anticipated to add incremental improvements in each component area.

There are currently few policies, strategies or programs to guide the retrofitting of buildings within the UBC neighbourhoods. As existing residential buildings age, they will require upgrades and retrofits, and this presents an opportunity to set forward performance requirements that achieve the goals of the GBAP for the extensive existing building stock. UBC will continue to work with the University Neighbourhood Association (UNA) and existing residential stratas to develop a retrofitting strategy for the neighbourhoods, which will align with the residential GBAP for UBC-owned-and-operated buildings.

2 Stadium Road Neighbourhood Plan is currently under development.
Costs and Benefits Associated with the Plan

The financial case for the GBAP is growing rapidly, acknowledging the complexity of building development, policy and climate change. An investment in green, resilient buildings will pay long-term economic dividends through reducing carbon liabilities, improving human productivity and using resources efficiently.

For all component areas, efforts will be made to pilot and monitor all measures before adopting them as a policy to ensure that they can be achieved within the capital budgets allocated to building projects. For some component areas in the GBAP, third-party studies have been used to help provide cost inputs.

Energy and carbon are priorities in terms of reducing cost and impacts. Two UBC energy costing studies, one for institutional buildings and the other for residential buildings, have been completed to better understand cost effective energy efficiency measures.

Above all, the GBAP supports the achievement of sustainable environments that enhance wellbeing for people at UBC and beyond in support of UBC’s fundamental academic mission.

Making It Happen

The development of the GBAP has included extensive engagement with UBC students, faculty, staff and residents as well as green building experts and government representatives to develop ideas for the future and better understand stakeholder aspirations linked with green building practices. With continued engagement, the implementation of the GBAP will be an ongoing and evolving process over the next 20 years, involving collaborations between multiple planning and operational departments at UBC and with academic researchers and external partners in order to implement new or update existing policies.

The success of the Green Building Action Plan is dependent on creating capacity with key agents of change, including developers and UBC departments. The GBAP lays the foundation, but continued stewardship is required and successful implementation will require sustained leadership, activity and investment.

Long-term Vision of Success

By 2035, the UBC Vancouver campus buildings will contribute towards a vibrant and sustainable campus that supports the academic mission. The physical campus will exhibit Campus as a Living Lab demonstration projects firmly tied to teaching, learning, and research, with an increased potential to lead to broader market transformation. A trajectory will be set for the building design, construction and operation along the pathway to achieving a net positive campus for human and natural systems. The GBAP will pay dividends in the long-term with lower energy bills, avoided control and damage costs of the environmental impacts of inaction, and reduced health costs. An iterative process that incorporates learning and experience between projects, will be established to advance performance targets and try new ideas, reinforcing an adaptive long term approach to operational planning. UBC will be a global leader in innovative green building design and construction and make net positive contributions to human and natural systems.
NET POSITIVE CAMPUS

Progress through existing sustainability policies as of 2018
Estimated progress through GBAP up to 2035
Remaining progress towards Net-Positive Campus