GREATER VICTORIA

2030
DISTRICT®

Annual Progress
Report

2021

This inaugural annual report celebrates the progress of the property managers and buildings that are participating in the Greater Victoria 2030 District. This is Canada's second 2030 District, joining 22 other leading communities in North America.

Our 2030 District is located in Greater Victoria, the capital region of British Columbia, Canada. Situated on the southern tip of Vancouver Island; a short ferry ride from Vancouver, Canada and Seattle, US.

We respectfully acknowledge that we are based on the land of the lək̓ʷəŋən and W̱SÁNEĆ peoples, including Esquimalt and Songhees Nations, and Coast Salish peoples.

The work of the 2030 District will support leadership efforts of local municipalities that have adopted aggressive climate action targets. Saanich Mayor Fred Haynes stated that he is "Delighted at the positive contribution 2030 District will play in enabling Saanich and Greater Victoria to demonstrate on a world stage the benefits of green buildings. Partnerships like this are essential in helping us achieve the goals of our Climate Plan (www.Saanich.ca/climateplan)."

"Congratulations to BOMA and its members on the establishment of the Greater Victoria 2030 District. It is great to see private sector led projects that align with our Climate Leadership Plan and will result in carbon reductions for buildings in Victoria," said City of Victoria Mayor Lisa Helps. "We are happy to provide financial assistance to the overall project and to actively participate in the District.

GV 2030 District Annual Report

Table of Contents

Overview

The Greater Victoria 2030 District brings together major property managers in the region to work towards a shared objective to significantly reduce energy use and greenhouse gas emissions, while also advancing energy affordability and resilience benefits. In so doing, the 2030 District is evolving to be a hub of high-performing buildings, transforming the built environment and the role it plays in mitigating and adapting to climate change.
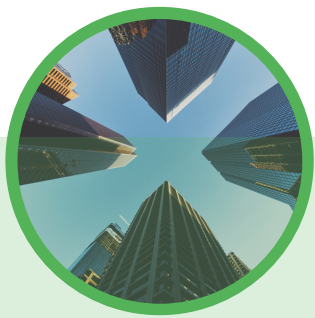
"BOMA knows this collaboration will play a key role in ensuring Greater Victoria builds back better from Covid-19, by advancing building resiliency and reducing climate change impacts."

-Damian Stathonikos
President of BOMA BC

Background

The Building Owners and Managers Association British Columbia (BOMA BC) along with 11 major property managers, the City of Victoria, and the District of Saanich officially launched the Greater Victoria 2030 District in January 2021. Funding is provided by the CleanBC Building Innovation Fund, municipal partners and energy utilities. Technical support is provided by a University of Victoria Research Team. This is Canada's second 2030 District, joining 22 other leading communities in North America.

Through the 2030 District, property managers from the private sector are demonstrating that significant reductions in energy use and associated greenhouse gas emissions can be made voluntarily. They are providing examples for other building owners to achieve their own reductions, positively contributing and encouraging climate action in Greater Victoria and elsewhere in BC.

The North American 2030 District network is also planning beyond 2030. The network aims to support members to move towards a zero-carbon goal by reducing operational energy use, decarbonizing buildings and designing new buildings to reduce embodied carbon, while ensuring healthy building environments, equity for everyone within and environmental resilience and adaptation.

"By investing in cleaner, more efficient buildings, businesses and partners in the Greater Victoria 2030 District are leading the way forward to a cleaner future, helping meet our climate change targets and supporting good local jobs for people in the process."

George Heyman
Minister of Environment and Climate Change Strategy
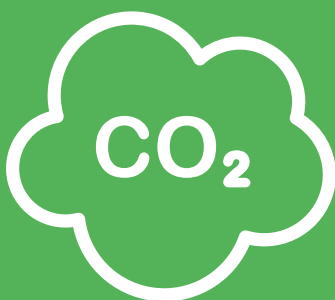
By the numbers

Buildings

36	Buildings Committed
3.7	Million Square Feet Committed
11	Leading Property Managers Participating

Energy

|	
50%	Energy use reduction target (from 2007 levels by 2030)
68%	Progress to energy use reduction target (percentage reduction to date)

Greenhouse Gas Emissions

80%	GHG reduction target (from 2007 levels by 2030)
44%	Progress to GHG target (percentage reduction)

Our Members

District Boundaries & Members

The 2030 District consists of the commercial core areas of Victoria and Saanich, along with other commercial and institutional centres. Participating properties included a diversity of building types, occupancies, ownership and age, now totalling 36 buildings, including 3.7 million square feet of space. Major property managers in the region are participating in the District, shown below.

For an interactive map see:
https://tinyurl.com/yyt7drwr
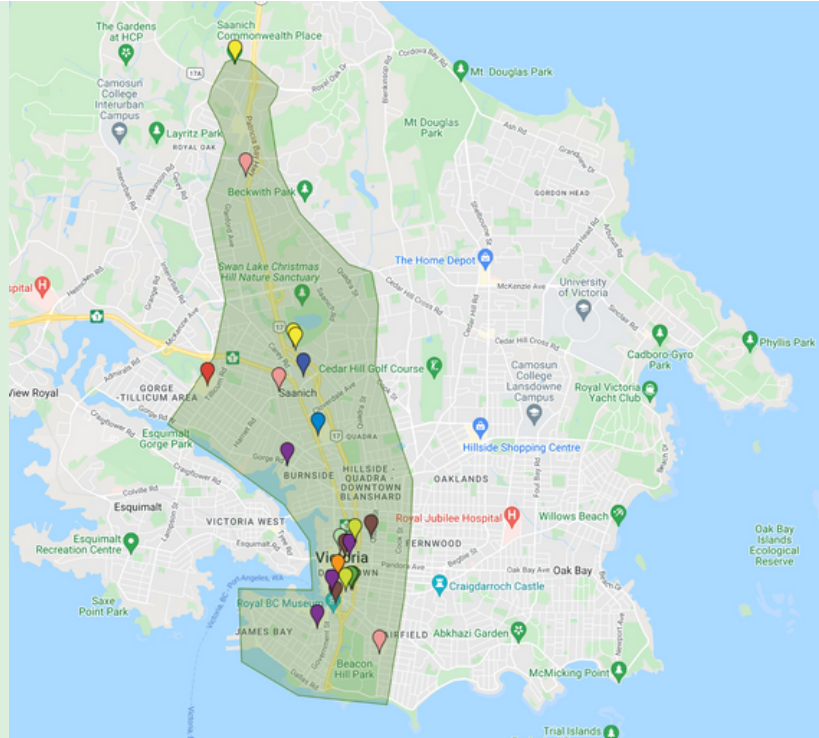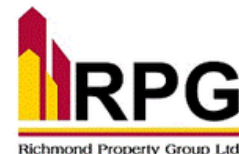
Energy & Emissions Benchmarking

Energy and emissions benchmarking is a critical component of the work of the 2030 District. In collaboration with our University of Victoria research team, we are helping property managers measure their progress against 2007 benchmarks for region-specific comparable building types. The majority of buildings in the 2030 District are making significant progress in meeting their energy and emissions targets. One of the 2030 District buildings is exceeding the target to reduce energy consumption by 50% by 2030 (building 1, below), another five have already met the target (eight years ahead of schedule), and the remaining 11 buildings are on track to meet the target.

**Progress to Energy Use Reduction Target for Each of the
2030 District Buildings**
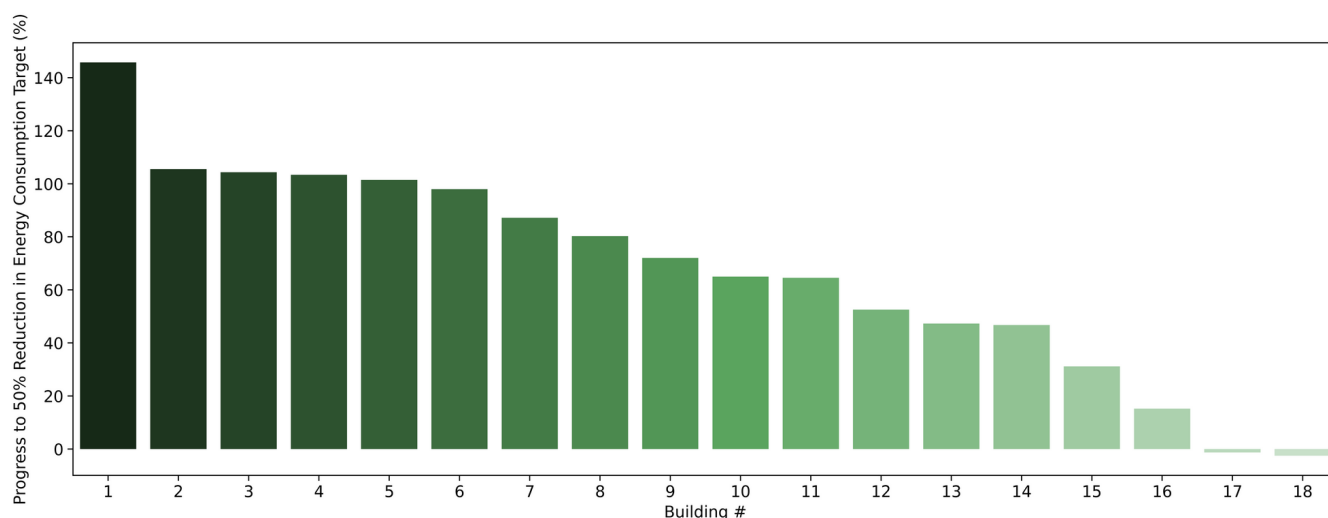
> *"Partnerships like this, with industry, researchers and government working towards a common goal, can really catalyze innovation and help ensure significant, long-term environmental and economic benefits are achieved,"* said Peter Wild, University of Victoria's acting dean of engineering. *"This partnership enhances Greater Victoria's potential to be a Canadian and North American leader in sustainable building retrofit design and construction."*

The charts below show the average energy use and GHG emissions for each building type (in the green bars), and the range across the buildings is indicated by the black lines – for 2007, 2019 and 2030.

The majority of office buildings in the District have already reached their 2030 targets for energy reduction, while the retail buildings are making substantial progress. The 2030 District is targeting an even greater reduction in greenhouse gas emissions– 80%, and impressively, both office and retail buildings are nearly halfway towards meeting this ambitious target.

Energy and GHG Emission Reductions for 2030 District Buildings
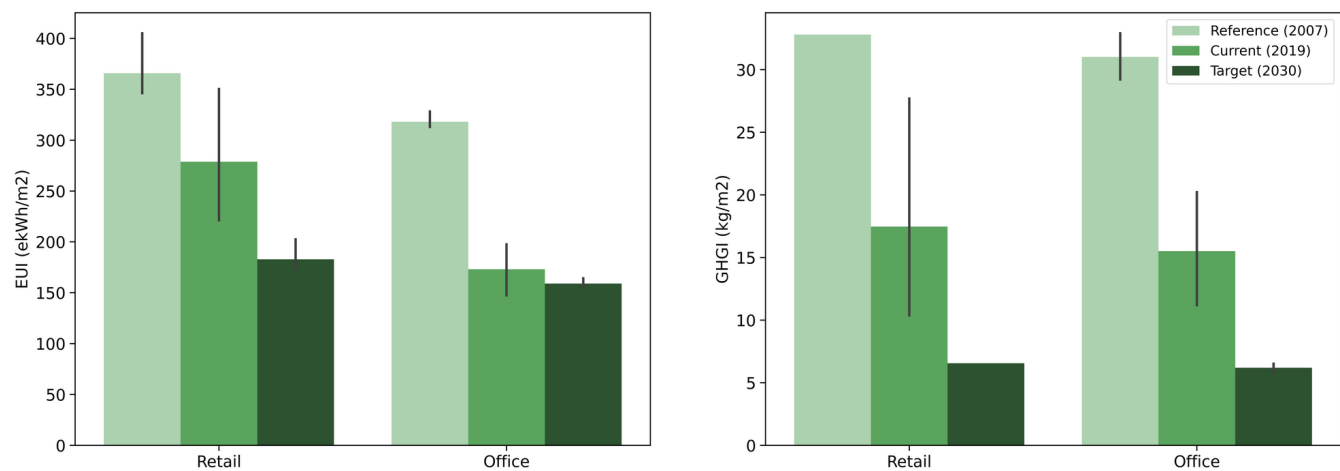
Services

Since launching, the Greater Victoria 2030 District has provided members:
- Energy benchmark reports and energy studies to identify opportunities and strategies to meet energy and emission reduction targets.
- Support via a peer network and access to specialists, a University of Victoria research team and government representatives.

As a core partner in the District, the University of Victoria (UVic) acts as a research hub. A research team from the Department of Civil Engineering provides technical advice to property managers, calculating energy and emission baselines and reduction targets and recommending optimal ways to reach the targets. Through this work, the District supports research to inform proposals for high-performance standards in Canada's National Building Code (NBC).

Key Services

Peer Support Network

Member meetings are held regularly throughout the year to share information amongst the members and to facilitate peer learning. These meetings are further supplemented with a newsletter and one-on-one meetings with the 2030 District technical team.

Previous member meetings have included presentations and discussions on: utility incentives, regulatory updates, EV charging, Smart buildings brainstorming sessions, Building Benchmark BC, and electrification opportunities.

Resiliency Tool

Led by: BOMA BC and the University of Victoria (Real Estate Foundation of BC (REFBC) funding), Launching in 2022

A resiliency decision support tool will be developed to enable commercial real estate owners to identify retrofit opportunities to improve building resiliency while meeting the energy and GHG emission reduction goals of the 2030 District. This project will immediately benefit 2030 District participants, but learning will also be shared with the aim of scaling the tool for use in other jurisdictions within BC.

Energy Studies

The Greater Victoria 2030 District secured funding from Fortis BC and BC Hydro to develop Energy Studies for the majority of 2030 District members (11-14 studies will be completed). The studies are developing customized pathways for each building to achieve deep reductions in energy and carbon emissions, over the next 8 years, to meet the 2030 target. Property managers are provided with solutions that are practical, constructible, and cost-effective. Recommendations prioritize load reductions, followed by efficiency and heat recovery options, and then finally fuel switching such as electricity, renewable natural gas, and/or on-site renewable energy. The 2030 District will be releasing a summary report detailing lessons learned for broad application.

Calibrated Modelling

Calibrated models are being developed using leading open-source, physics-based software such as EnergyPlus. Model calibration is in progress for two 2030 District buildings: Saanich Municipal Hall and Annex (a mid-sized office archetype) and The Bay Centre (as an indoor retail mall archetype). Through this process, the model inputs are tuned so that outputs match measured data. This work will build on initial work that has included time-resolved climate inputs and energy use outputs.

Benchmarking Studies

Many of the participating buildings did not have energy and GHG emissions baseline data sets for 2007, either because they were constructed after 2007 or because they were under different ownership at that time and access to information was unavailable. Thus, energy and emissions benchmarking were conducted to enable target setting. Reference cases (benchmarks) were identified from comparable buildings in British Columbia, considering climate and major occupancy, and normalized against floor area using Energy Use Intensity (EUI) and Greenhouse Gas Intensity (GHGI) metrics to provide a fair comparison of buildings with different floor areas. Seventeen benchmarking studies have now been completed and provided to property managers, enabling the setting of energy and emissions targets.

NBC Code Change Request

Led by UVic Research Team

Based on research findings, above, the impact of retrofit options across the building stock will be assessed and the resulting findings will inform recommended changes to the 2025 NBC starting in 2023 and beyond, along with the ASHRAE 100 standard that is referenced by a new BC retrofit income tax credit. The study team will also provide ongoing analysis and feedback on code proposals via annual public reviews.

Retrofit Decision Analysis Tool

Led by UVic Research Team

An archetype surrogate modelling process for existing buildings will be developed by incorporating calibration parameters to adjust the underlying model archetypes to better represent existing buildings. This will underpin a "Retrofit Navigator", a platform that extends the Net-Zero Navigator (NZN) platform to cover retrofit decision support for a range of buildings using a similar surrogate modelling process. This will include inputs that are currently held constant in design-stage surrogate models, like set points and occupancy levels, and wider bounds for many inputs like insulation levels and air-tightness so that these cover the values seen in existing/older buildings. The tool will be piloted with 2030 District buildings initially and then released more broadly.

2030 District Case Study: Bay Centre
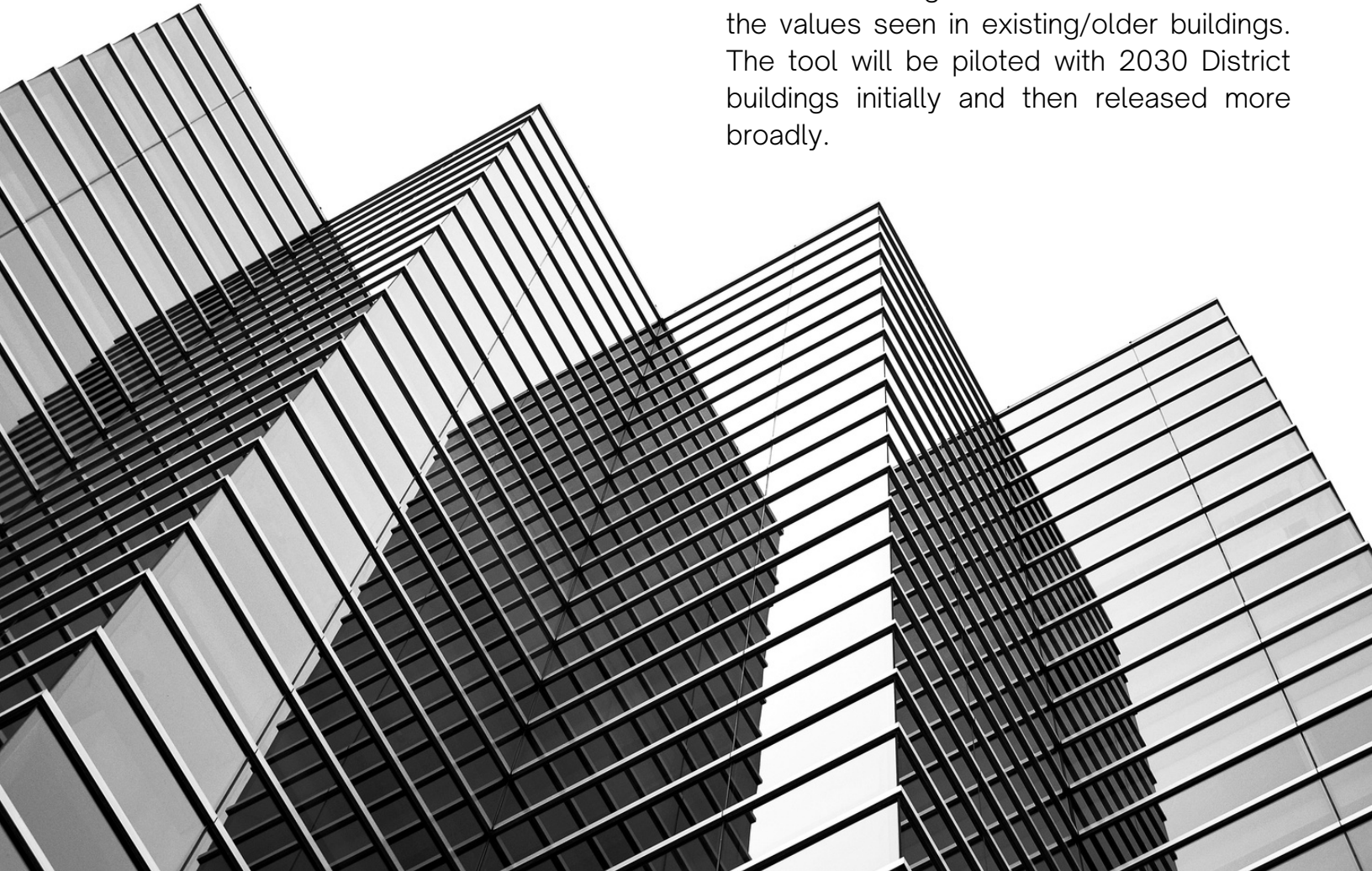
Bay Centre is demonstrating the viability of achieving substantial reductions in energy use and greenhouse gas emissions in commercial buildings through the integration of energy-efficiency measures while also working within the reality of financial constraints and limited control of tenant loads.

Located in downtown Victoria, Bay Centre is a 47,500 m2, four-storey enclosed mall that includes retail, parking and food services. The building was constructed circa 1989 and currently receives up to 6.5 million visitors per year. Mechanical equipment account for the highest energy end use (33%), closely followed by lighting (33%), plug load (25%), and gas equipment (9%).

Between 2011 and 2019 the mall **achieved a reduction of 29% in** both energy consumption and overall greenhouse gas(GHG) emissions. Property manager Cushman Wakefield Asset Services implemented a series of measures to achieve these reductions, including: common area lighting upgrades, heating, ventilation, and air conditioning (HVAC) controls optimizations, installation of an adaptive frequency drive (AFD) in the chiller plant, and upgrades to the building automation system (BAS). Additionally, the building is presently undergoing a roof replacement to increase its insulation level.

Bay Centre, along with other members of the 2030 District, recently received an energy study that will help property managers and owners uncover means of achieving the 2030 target to reduce energy consumption by 50% and GHG emissions by 80% from 2007 levels.

Their study addresses a key challenge for the building – that it lacks a centralized heating system – meaning that custom opportunities would need to be uncovered to achieve deep energy and carbon savings.

Eleven energy conservation measures (ECMs) were identified in the study, including: recommissioning of existing control strategies or upgrades to the BAS, equipment upgrades including replacement of remaining fluorescent and High-Intensity Discharge (HID) fixtures with LED ones, and upgrades to the existing cooling plant. One opportunity is to equip the proposed cooling tower with a new heat exchanger and variable speed drives (VSDs).

Additionally, since tenant systems account for a significant portion of the building's energy use (64% in 2019), a more thorough understanding of the tenant HVAC loads and a tenant engagement plan will be crucial to recognize additional energy savings opportunities, most notably towards reducing natural gas consumption with improved rooftop unit efficiency and cooking equipment.

Additional opportunities could include rooftop photovoltaics (PV), the purchase of renewable natural gas, and electric vehicle (EV) charging infrastructure installations.

The Greater Victoria 2030 District will continue to support the efforts of Bay Centre and other members of the 2030 District as they implement measures identified in their energy studies and meet and surpass the 2030 targets.

"At Bay Centre, we pride ourselves in adopting progressive environmental standards and practices by continually measuring, managing and improving our environmental performance through energy, water, consumption and waste reduction" said Darlene Hollstein-General Manager Bay Centre.

"For this reason, it brings us great pleasure to join a network of North American leaders, as a founding partner of the new Greater Victoria 2030 District, and make a commitment in reducing our energy and greenhouse emissions by a further 50% by 2030."

For more detail see: https://www.2030districts.org/greater-victoria