



Building Benchmark BC Annual Report 2021

Building Benchmark BC is a local-government-led pilot project working to inform and inspire public and private sector leadership on built-environment climate change solutions. The informal assembly of communities behind the pilot aims to better understand the role of building energy benchmarking and disclosure within a larger suite of climate regulations, policies, and incentives.

We gratefully welcome the support of our partners, who contributed funding or in-kind resources to Building Benchmark BC

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Produced by Glave Strategies for the OPEN Green Building Society on behalf of Building Benchmark BC.

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The OPEN Green Building Society is based in Vancouver, British Columbia, on the unceded territory of the Coast Salish Peoples including the territories of the xʷməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and Səlilwətaʔ/Selilwitulh (Tsleil-Waututh) Nations.

Sharpening Focus on Building Performance

On behalf of our 12 participating jurisdictions, I’m pleased to present this summary of the first reporting cycle of Building Benchmark BC. We’re delighted that participation went well beyond our expectations; the dozens of building owners and operators that have come aboard have recognized the value of measuring and disclosing the energy use and greenhouse gas emissions of their assets.

This pilot project is already offering critical insights for both companies and jurisdictions. Both parties are seeing the urban landscape in a new light, and bringing building performance into sharp focus for the first time.

These insights are especially helpful given the larger policy shifts underway. The Province of British Columbia will release a building-sector greenhouse gas target by the end of March 2021, and the province is also targeting 2024 for a retrofit building code. And federal support may soon be available: The Canada Infrastructure Bank’s Growth Plan recently earmarked \$2 billion to invest in large-scale building retrofits across the country.

Building Benchmark BC participants are strategically well-positioned to respond to these developments, and make more informed investment and program decisions. And for their part, local governments are better equipped with the fine-scale market knowledge they need to ensure they target programs where they can capture the biggest return. It’s a win for all involved.



Sincerely,
Donovan Woollard
Managing Director, OPEN Green Building Society

Ps We are now welcoming participants for our next reporting cycle. Join us via buildingbenchmarkbc.ca.

INTRODUCTION

About this Document

This, the 1st Annual Report of Building Benchmark BC, updates current and prospective program participants, and other stakeholders, on the pilot’s progress to date. It compiles high-level energy and emissions data voluntarily shared by building owners and managers across the 11 participating jurisdictions, and offers initial analysis of the trends that have emerged to date from the first reporting period.

What is Building Energy Benchmarking?

Building energy benchmarking is the process of collecting and monitoring energy and greenhouse gas emissions data from a large number of buildings over time, allowing owners, managers, occupants, and governments to compare the performance of similar participating properties. In doing so, property owners, policy makers, incentive designers, and capital providers can funnel resources towards the best interventions, in the right buildings, to achieve the highest climate benefit.

Building Energy Benchmarking Helps:

Building owners and managers track a property’s climate and energy performance from one year to the next and identify potential issues for further investigation. It also allows them to easily see how well their building is performing relative to similar properties.

Governments and utilities target energy and greenhouse gas reduction policies, programs, and regulations to areas of the building sector where they will have the most impact. It also helps them more easily and reliably analyse the impacts of these policies and programs.

Capital providers understand and address the climate implications of their lending and investment portfolios.

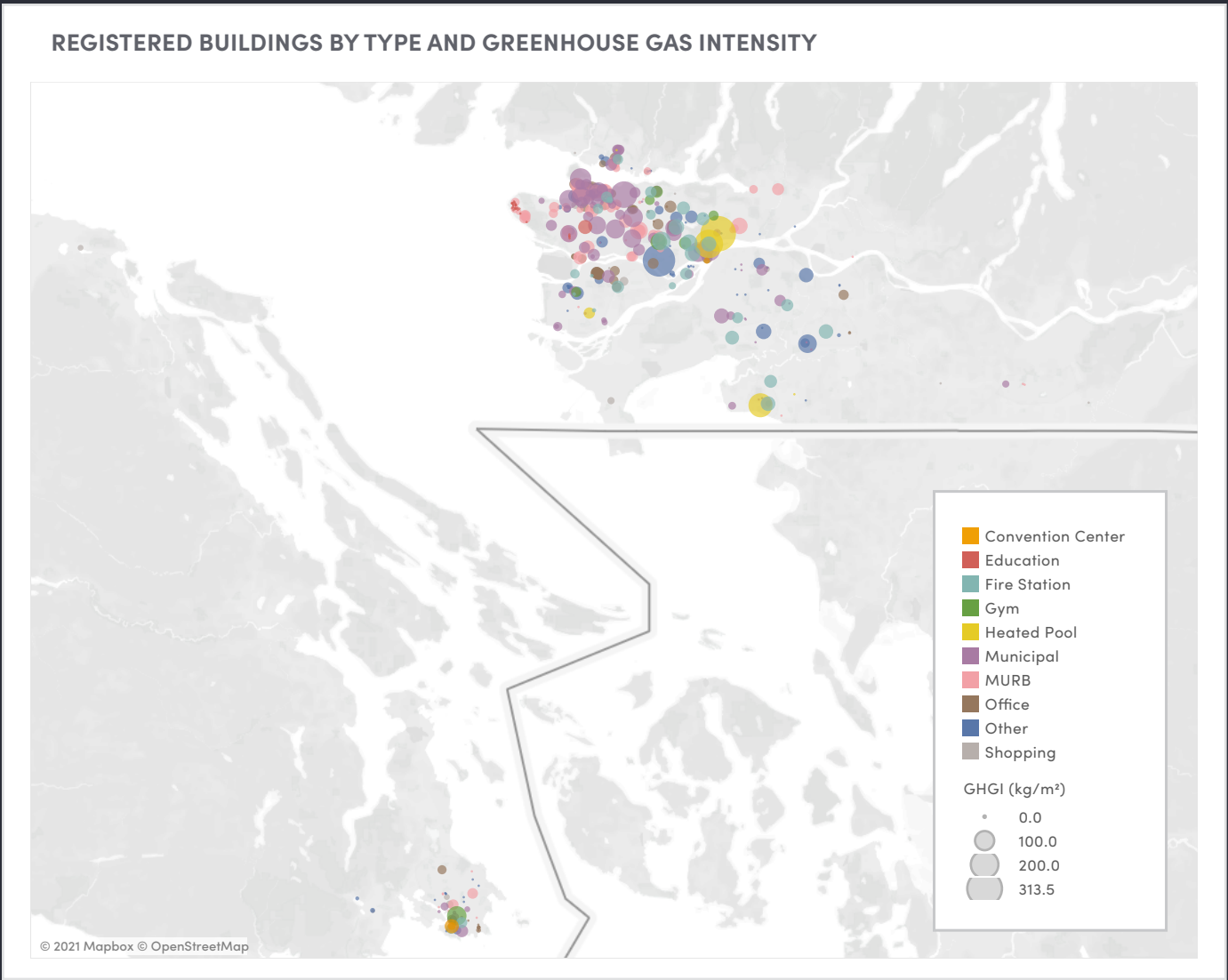
Though the City of Vancouver has notified industry that it will require building benchmarking in the coming years, as of this report, there are no mandatory provincial or sub-provincial building energy benchmarking programs in British Columbia. All participating building owners and managers voluntarily reported the data in this report via the Building Benchmark BC website at buildingbenchmarkbc.ca.

WHAT DID WE COVER?

Local governments participating in the Building Benchmark BC program are inviting property owners and managers to submit data for existing Part 3 buildings. In this, our first year, we primarily targeted:

- Private buildings larger than 50,000 square feet;
- Multi-unit residential buildings larger than 20,000 square feet; and
- Municipal buildings of any size.

But those types were, by far, not the only buildings we assessed. We tackled a diversity of building and ownership types. For this first year, we sought to demonstrate the value of interesting data insights while also laying the foundation for comprehensive data collection and insights over time.



HOW DID IT GO?

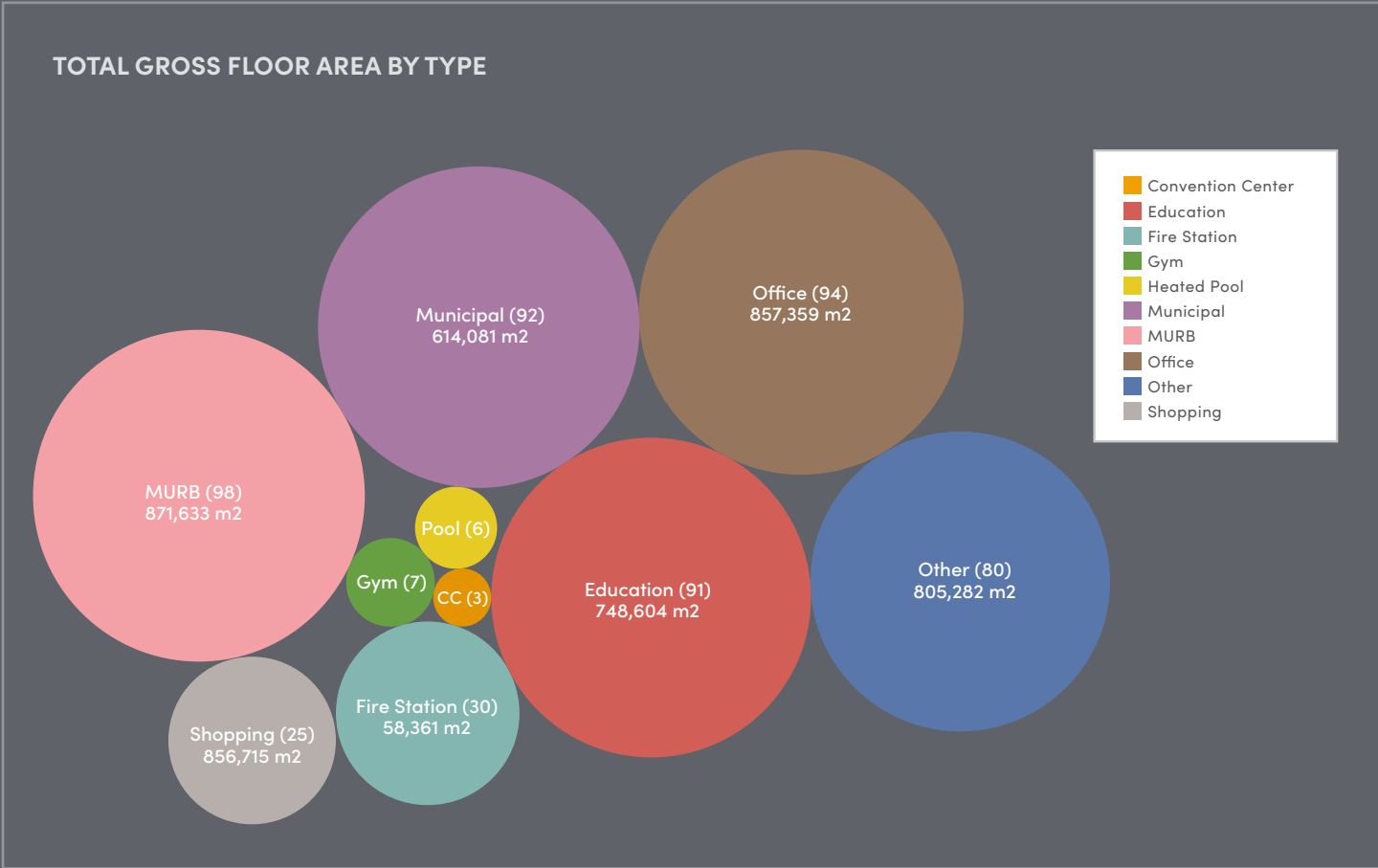
Off to a Great Start

We exceeded our first-year objectives by a generous margin, as more local governments joined the program, and more property owners and managers realized the benefits of signing up, and did so.

We launched the program on January 21, 2020 with the goal of having 550 properties registered by the end of that year.

By April, we had already blown past that target and, by the end of the first year, building owners and managers had pledged to submit building performance data on 765 individual properties. As a result of delays and reprioritization during the Novel Coronavirus pandemic, we received data for 70 per cent of those properties.

Collectively, the submitted properties to date represent 4,969,671 square metres of conditioned floor space, which is the equivalent space occupied by 928 regulation Canadian Football League fields.



WHO WAS INVOLVED?

Participating Jurisidictions

We started out with six local government partners on board (including the University of British Columbia); by the end of the year we had 12, including communities in the province’s interior region, as well as on Vancouver Island.

As of the end of our first year, the following local governments were collecting building performance data via Building Benchmark BC:



Participating Property Owners

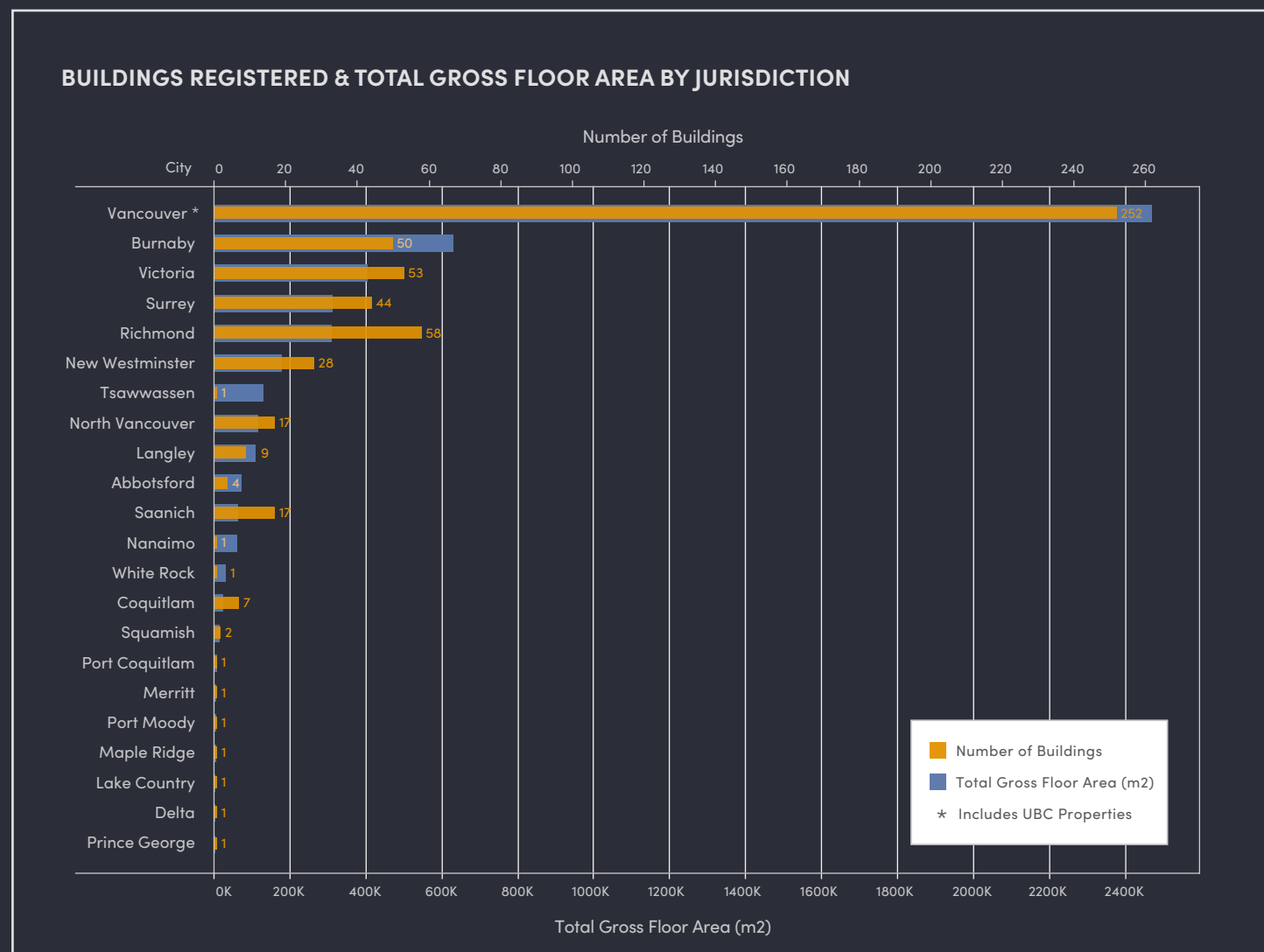
Alpine Place	City of Victoria	Metro Vancouver
BC Housing	Colliers International	Oxford Properties Group
BC Hydro	Concert Properties	Private Residences at Hotel Georgia
BC Nonprofit Housing Association	District of Saanich	QuadReal Property Group
CapJ Properties	Gateway Property Management	Shape Property Management
Circa	GNW Trust	Sunrise Co-op
City of Burnaby	Hemlock Printers	The Duke
City of New Westminister	Hollyburn Properties	The Sandpiper
City of North Vancouver	Ivanhoe Cambridge	The Versatile
City of Richmond	Landmark Caprice	Tiffany Mansion
City of Surrey	Landmark Manor	UBC MURBS
City of Vancouver	Marriott Hotels (Vancouver)	Vine Crest Manor

HOW DID IT GO?

Tallying the Totals by Jurisdiction

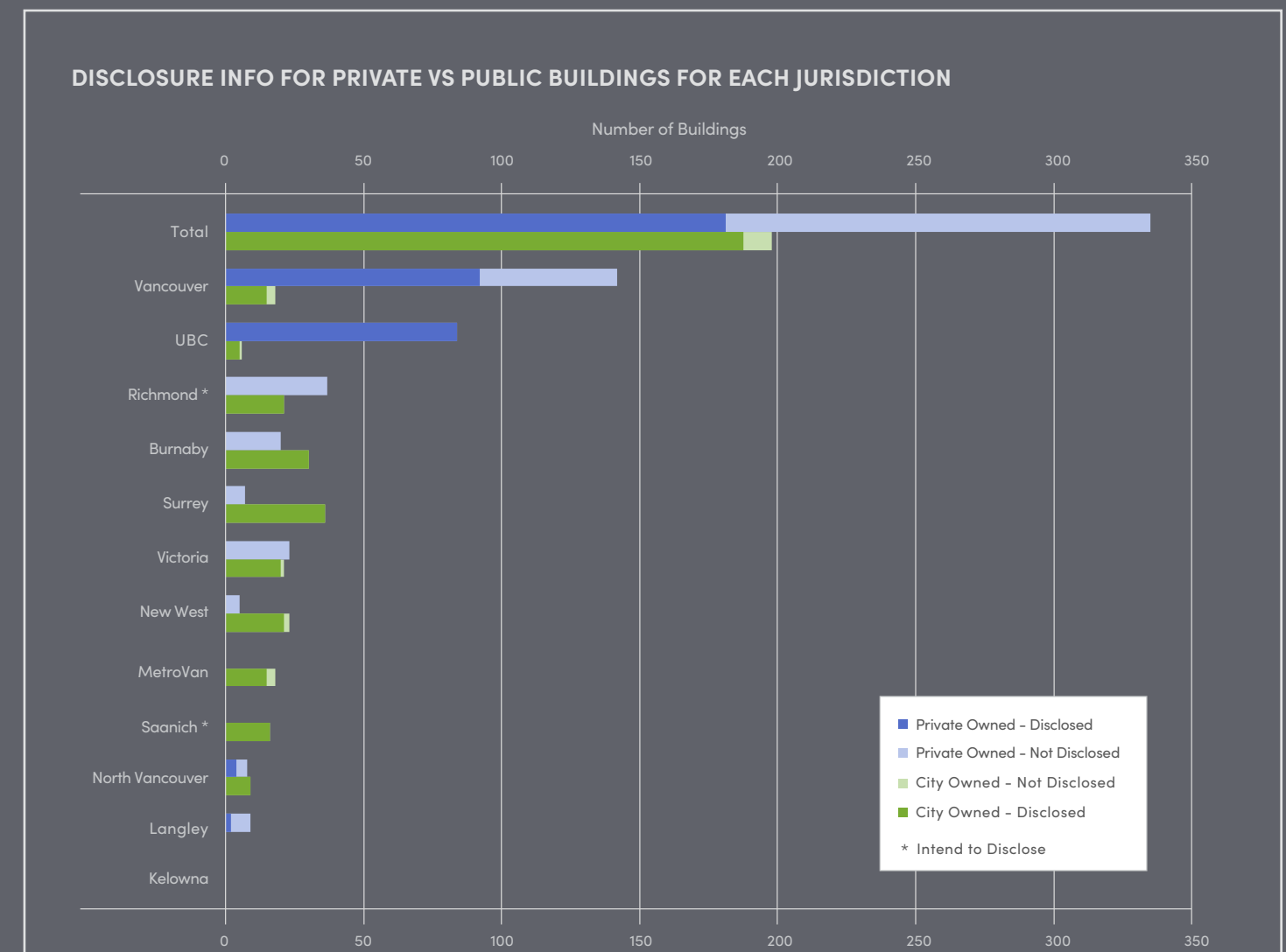
The majority of participating buildings, 250 properties, had a City of Vancouver address. Those represent over 2,400,000 square metres of conditioned floor space. This is not surprising, given that Vancouver is the most populous participating local government, with the highest density of tall buildings.

After Vancouver, participating local governments with the most registered buildings were the City of Richmond (58), City of Burnaby (50), the City of Victoria (44), and the City of Surrey (43).



Local Governments Take the Lead

In this, our first year, property owners and managers registered hundreds of buildings—but publicly disclosed the energy and emissions data for fewer than half of them. This may be the result of pandemic jitters, or perhaps just an understandable reluctance to “go first” in a brand-new program. Meanwhile, jurisdictions including the City of Vancouver, Metro Vancouver, and the City of North Vancouver, and the City of New Westminster disclosed data for all of their civic buildings and facilities. In 2021, with a year under our belts and with mandatory benchmarking on the horizon in the City of Vancouver, we expect building owners will grow more comfortable with the program, and that private-sector disclosures will more closely match registrations.



WHAT HAVE WE LEARNED?

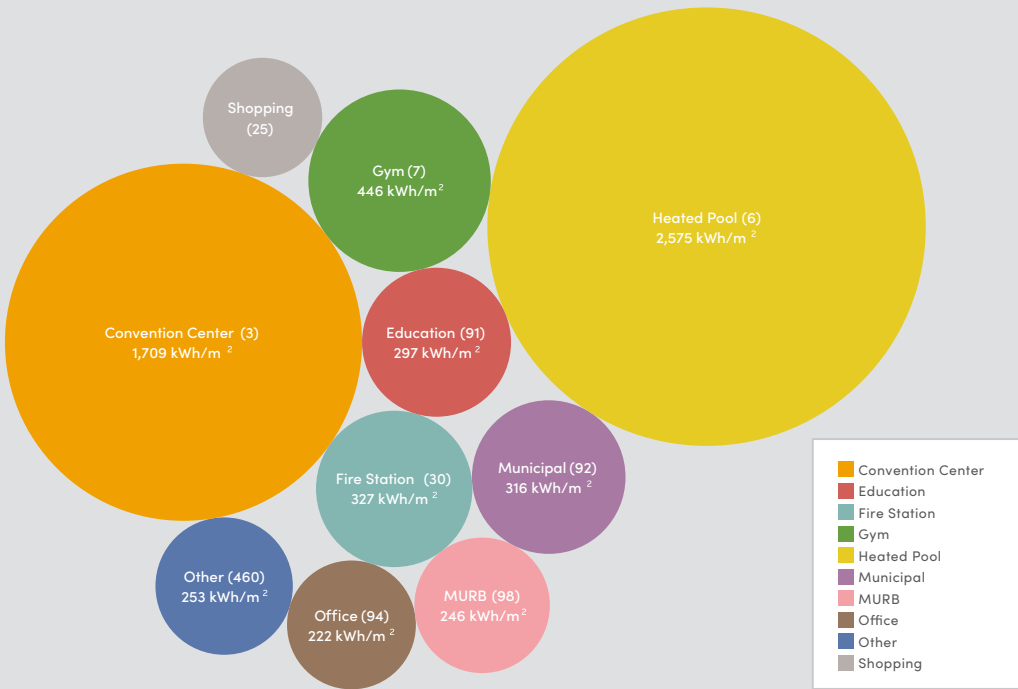
After crunching the data provided to date, we are pleased to share insights on the buildings in our dataset, and offer a few overarching conclusions on what the numbers reveal.

Trickier to Measure, but Critical for Equity

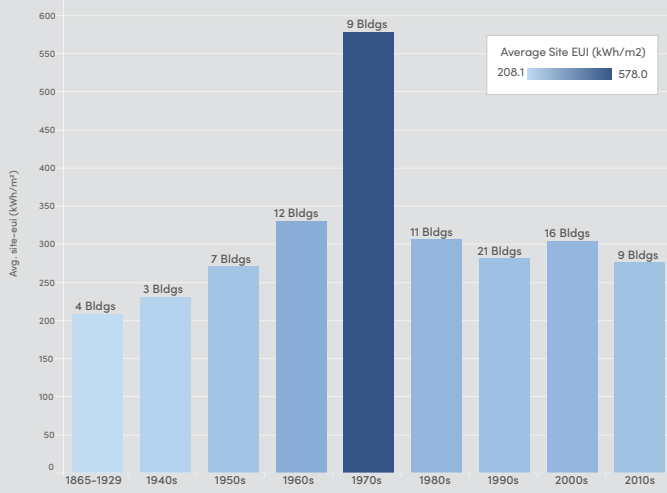
It’s almost a no-brainer to benchmark large, corporately-owned, and utility-integrated buildings. In fact, most benchmarking programs start there, and position such properties as the “low-hanging fruit” of mandatory disclosure. However, often the more marginalized or vulnerable residents and/or owners live in or make capital decisions about smaller, multi-tenant, metered buildings. Tackling all buildings in a mandatory program from the outset—including these more “difficult” multi-unit residences—will not only align policy objectives with climate justice, they will also likely capture a greater share of greenhouse gas reductions.

ENERGY USE INTENSITY BY TYPE

From Big to Small:
Of all building types, the largest energy consumers are, in descending order, heated swimming pools, convention centres, gyms, fire stations, municipal buildings, schools, and multiple-unit residential buildings. This bubble chart depicts the average energy use intensity (EUI) of various building uses, expressed as kilowatt hours per square metre.



AVG EUI BY YEAR BUILT



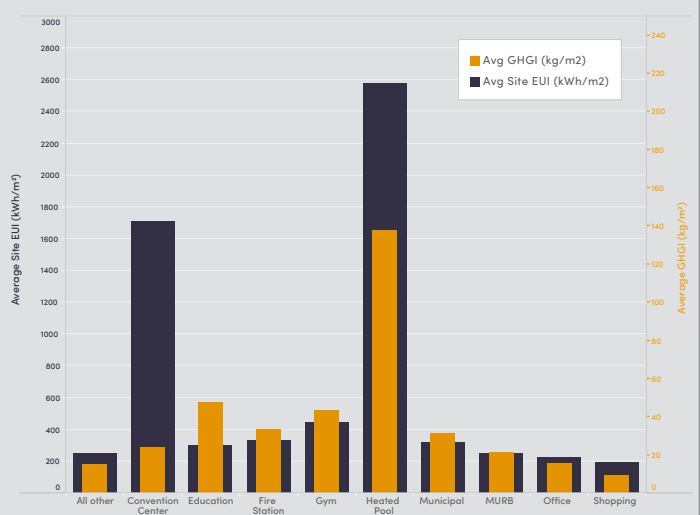
Disco-era Buildings are Reaching their “Best Before” Dates

Buildings built in the 1970s, on average, consume far more energy for heating and cooling than those built in other decades. That’s likely a reflection of the building materials and approaches in use at the time. Many are concrete buildings with glass curtain walls, and single glazing. In addition, the envelopes of many of these buildings are reaching the end of their useful life.

On Carbon, Fuel Matters More than Size

While far from the largest buildings in the Building Benchmark BC data set, swimming pools and convention centres have the highest energy use intensity (EUI) per square metre. But high energy use doesn’t automatically translate to poor environmental performance. Here’s why: first, EUI measures energy consumption relative to floor space, not building volume. These buildings have cavernous open spaces with few floors relative to their height. In other words, they have a large volume of air to heat or cool relative to their floorplate. Second, convention centres can be—and often are—heated with electricity, which in British Columbia is 94+ percent non-emitting. Meanwhile, pools are heated with natural gas, a leading source of climate pollution. While both use a lot of energy, only one also produces a lot of carbon. And neither burns as much natural gas as a share of their total energy consumption as education facilities, gyms, or fire stations.

GHGI VS EUI BY TYPE



WHAT HAVE WE LEARNED?

Are High Fire Station Scores a Cause for Alarm?

The Building Benchmark BC database includes energy and emissions information for 29 fire stations, and confirms that these facilities are among the most energy-intensive buildings in the province today. On average, they use 330 kilowatt hours per square metre (kWh/m²) per year.

Why? These specialized buildings feature large apparatus-bay doors that are frequently open, they are staffed for 24/7 response, and include fitness facilities, kitchens, and dormitories.

The City of Vancouver is currently building Fire Hall No. 17, North America’s first firehall that will target Passive House certification. The designers and engineers behind this facility have used a range of strategies to reduce energy consumption to a scant 79kWh/m² per year.

The previous fire station, on the same site, used 384 kWh/m² per year, a reduction of about 80 per cent compared with its predecessor.



Rendering courtesy HCMA

WHAT ARE PEOPLE SAYING?

Building Benchmark BC participants share a few choice words on why the pilot works for them.



Linda Buchanan
Mayor,
City of North
Vancouver

“As we work to improve energy efficiency and decarbonize our civic facilities, Building Benchmark BC is giving the City of North Vancouver a unique opportunity to evaluate and compare the performance of our civic buildings with similar building types across our region. Benchmarking is critical for assessing baseline performance and measuring our progress as we work towards becoming a more sustainable and liveable community.”

WHAT ARE PEOPLE SAYING?



Anderson Charles
Key Account
Management,
BC Hydro

*“Benchmarking is essential for organizations to understand their environmental impacts in the world. It allows them to take the proper actions to reduce or minimize those impacts, and sets them on a greener path. In my role, **benchmarking helps me to better paint a picture for customers** and assist them with analyzing their data to achieve success.”*

Malcolm Brodie
Mayor,
City of Richmond

*“The City of Richmond has long been a leader in energy benchmarking and is a strong advocate for building energy benchmarking as a tool to reduce greenhouse gas emissions. As a proud municipal participant in Building Benchmark BC, we encourage building owners and property managers of larger residential, commercial and industrial buildings to register with the program in order to help build on the momentum that’s already underway, and to **receive the benefits the program offers.**”*



WHAT ARE PEOPLE SAYING?

Rachelle Grohs
BC Non-Profit
Housing Association
Asset Management
Coordinator

*“The BC Nonprofit Housing Association has been encouraging energy benchmarking in multi-unit residential buildings to gain a more accurate understanding of energy use across our sector. It’s become an important aspect of energy-retrofit coaching, as it helps us to target specific buildings that could benefit from energy-efficiency upgrades, and offers housing providers **a more efficient way to allocate their funds** towards building upgrades.*

Benchmarking not only helps non-profit housing societies better understand their buildings and see the benefits of energy-efficient retrofits, but also helps support the needs of the sector as whole.”



Oskar Kwieton
Shape Properties
Property Manager

“We ensure year-round comfort for our guests and associates across more than 250,000 square metres of commercial real estate in Western Canada, while maximizing returns for our partners.

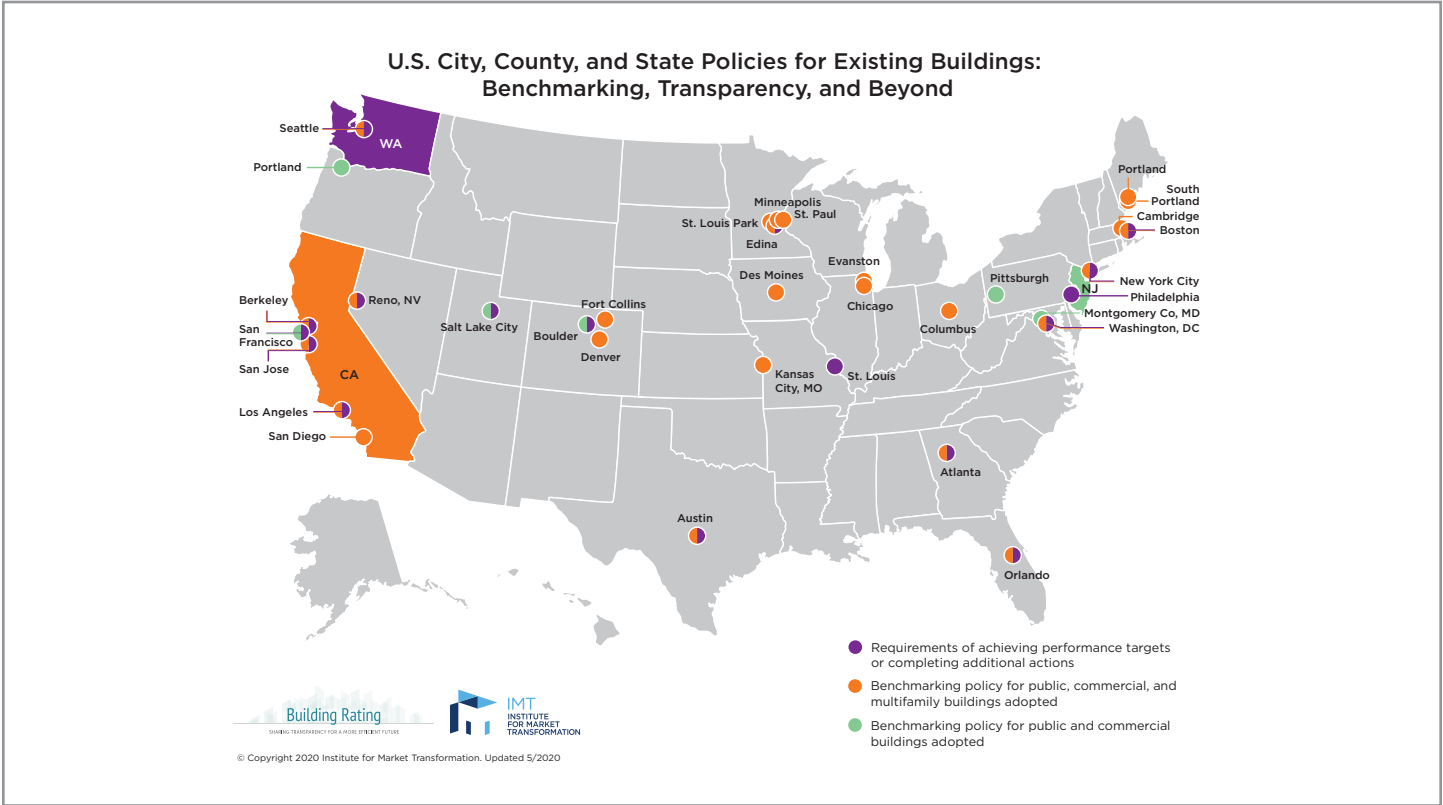
*Building benchmarking is providing our teams with critical insights into energy and carbon of our space and water heating, cooling, and ventilation systems, and it’s helping inform strategic recommendations on capital plans. **Ignoring GHG emissions won’t make them go away**; it’s an open secret that the policy landscape is changing, and we’re convinced that benchmarking gives us a competitive edge, to make sure we stay on top and out front.”*

New regulation? The writing is on the wall.

There are currently no mandatory provincial or sub-provincial building energy benchmarking programs in British Columbia. However, advocates of the approach believe that—given its demonstrated success in other jurisdictions and the Province of British Columbia’s ambitious climate targets—it is only a matter of time. The City of Vancouver has indicated that it will begin mandatory benchmarking in 2023.

OTHER JURISDICTIONS HAVE SORTED OUT THE BUGS

Mandatory energy benchmarking has been used in North America since at least 2009. That year, after several years of benchmarking data collection, New York City began requiring energy and emissions reporting for buildings that are the equivalent of 4,645 square metres. Today, more than 30 jurisdictions in North America have mandatory building energy benchmarking. This includes 30 U.S. cities, two states (Washington and California), and one province (Ontario).



This map identifies mandatory benchmarking programs across North America.
Source: Institute for Market Transformation

PROPERTY OWNERS AND GOVERNMENTS BOTH BENEFIT

With more than ten years of applied experience, the benefits of mandatory building energy benchmarking are now well understood.

The practice has been shown to:

- Increase conservation behaviors and sharpens energy management practices among both occupants and owners by revealing operational energy use.
- Help property owners make more targeted and strategic capital investments.
- Promote further efficiency by improving commissioning and maintenance regimens.
- Incentivize competition in the commercial real estate sector to deliver better energy performance.
- Inform energy policy development at municipal, regional, and national governments, allowing them to better substantiate GHG targets and design more efficient programs to direct support where it is needed most.

RESEARCH BACKS IT UP

A 2017 review of energy benchmarking programs in the United States by Lawrence Berkeley National Laboratories found that mandatory benchmarking programs contributed to a 3 to 8 percent decrease in building energy use intensity (EUI) levels, over a two- to four-year period following policy implementation. Although it is not possible to attribute all of these savings directly to benchmarking, the same study concludes that there is a “causal relationship between benchmarking policies and energy impacts.”

Charting the Past, Present, and Future of Building Benchmarking

Though regulators have yet to commit to mandatory building energy benchmarking, governments at all levels have been mulling over the approach for some time. Given that buildings contribute about 11 per cent of British Columbia’s climate pollution, and that our province has established binding targets, it’s clear that **new regulation is inevitable**.

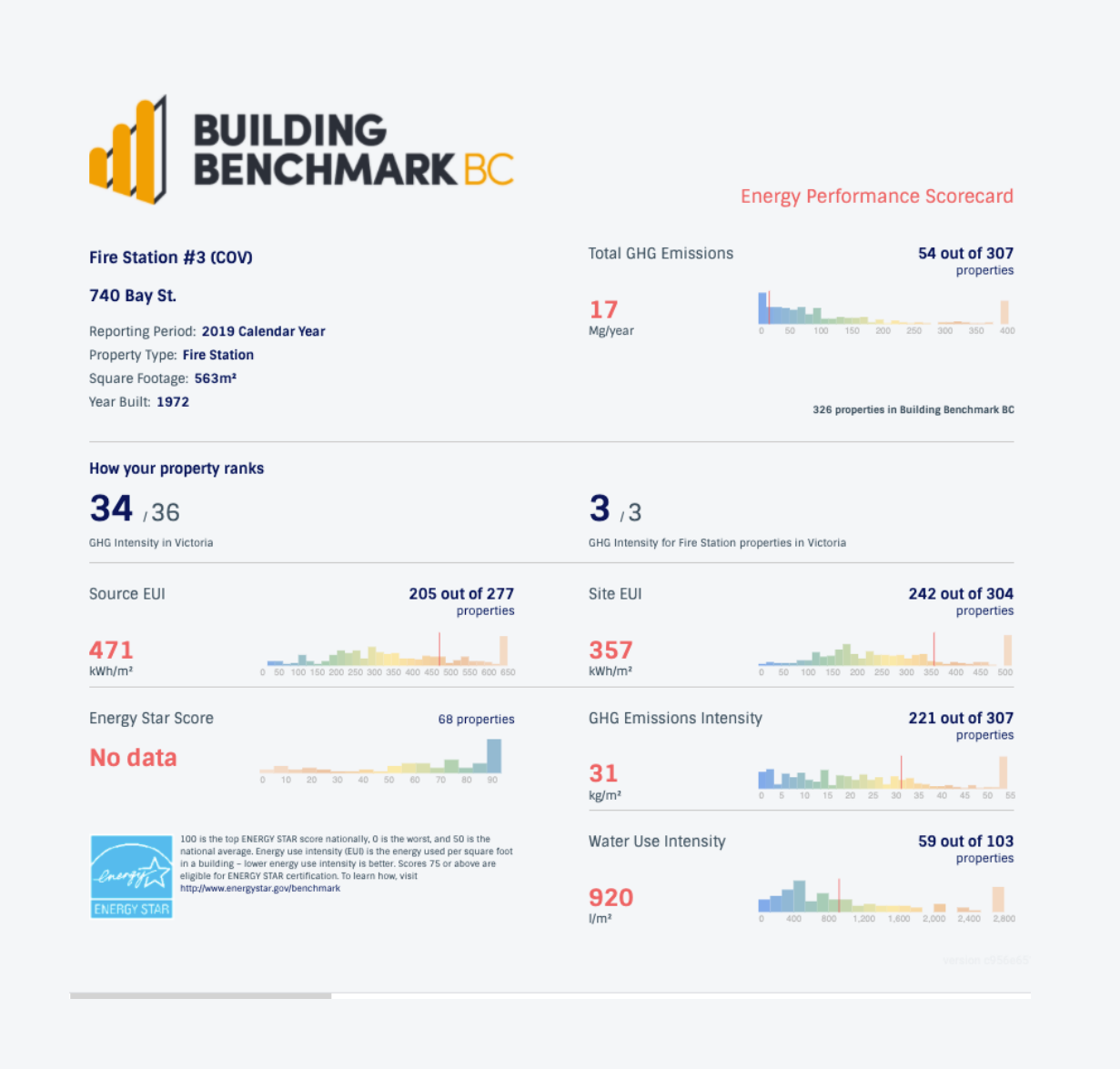
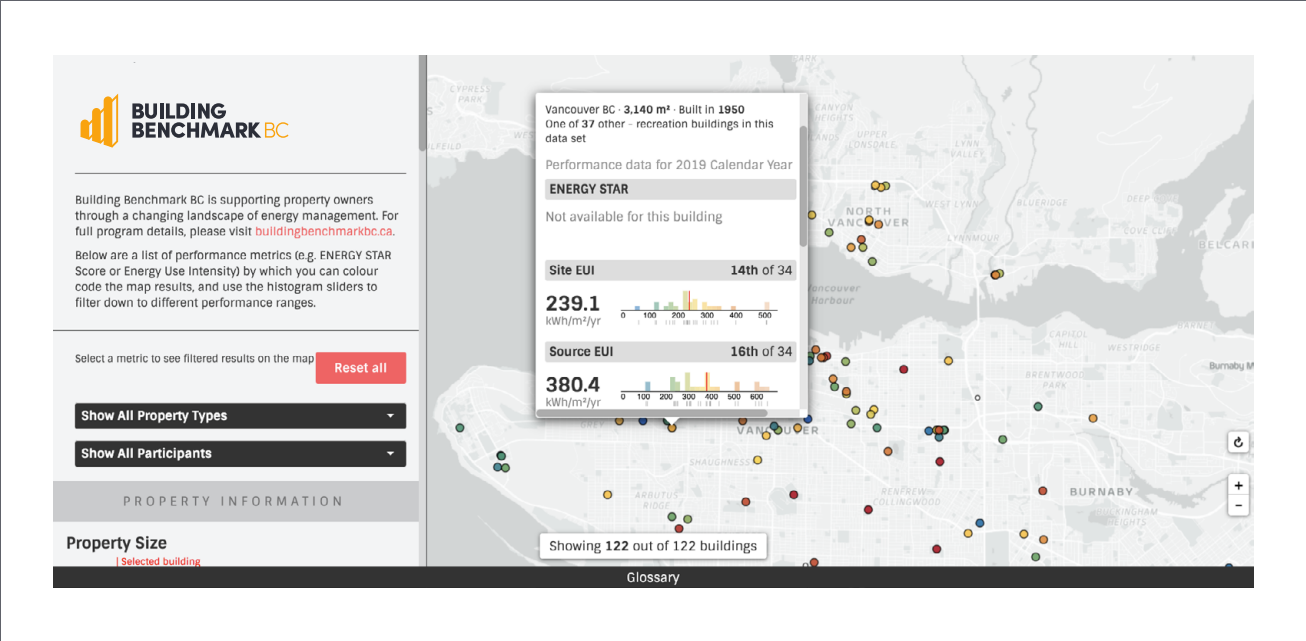
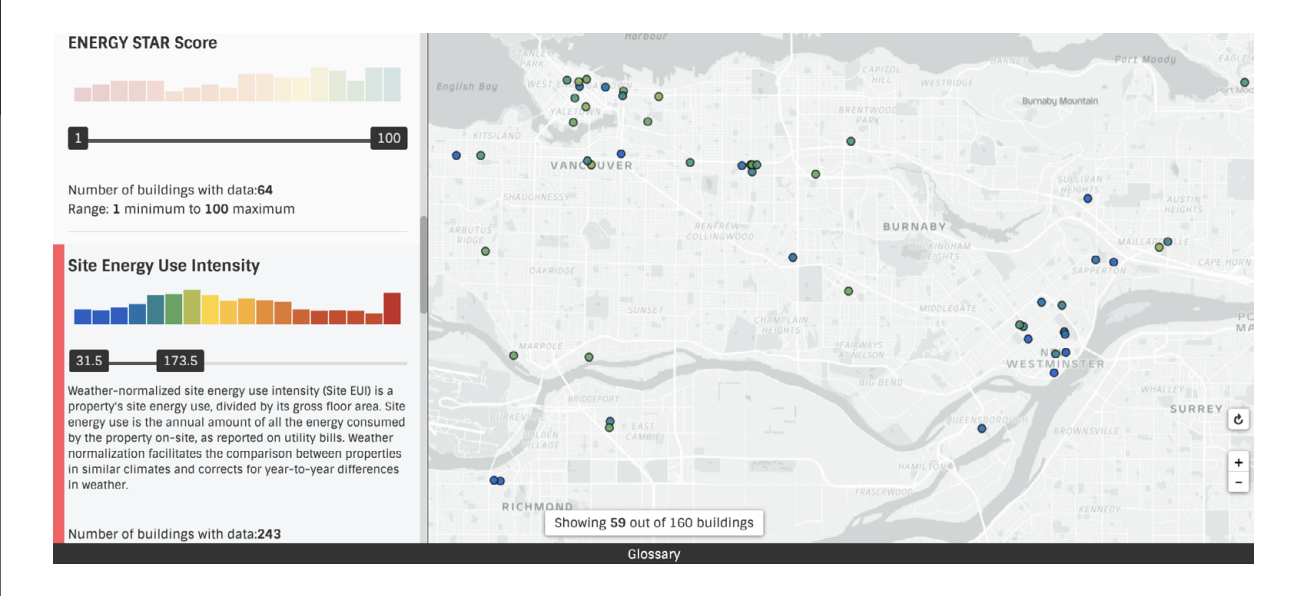
Benchmarking is helping the commercial real estate sector work out the kinks now, so that the transition to energy-efficient, lower carbon buildings will be as smooth as possible for all involved.

Here, we chase down various relevant commitments and targets, past and future.



Ready to Dive into the Data?

Sift and sort the benchmarking data to uncover your own insights via the Building Benchmark BC disclosure site at buildingbenchmarkbc.ca/data.



Participants can visualize their individual properties in the Building Benchmark BC database; we have compiled all the key data on each building onto an Energy Performance Scorecard.

Use sliders to filter the data set by community, building type, emissions intensity, and more, all rendered in real time.

Join the Movement.

Intrigued by what you've seen here? We welcome anyone to take a deeper dive into the data via buildingbenchmarkbc.ca/data.

Building Benchmark BC is now inviting building owners and managers to participate in the second phase of the program. We are also welcoming additional local governments on board.

To learn more and receive a welcome package, please contact support@buildingbenchmarkbc.ca.

