CAGBC Canada Green Building Council | Conseil du Bâtiment Durable du Canada

FULL DISCLOSURE

REAL ESTATE'S CLIMATE LEADERSHIP IN ACTION

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ACKNOWLEDGMENTS

The Canada Green Building Council (CAGBC) acknowledges the contributions of the program team partners, sponsors and Disclosure Challenge participants in the preparation of this report.

PROGRAM TEAMS

CAGBC Canada Green Building Council | Conseil du Bâtiment Durable du Canada

The Canada Green Building Council supports the building sector's efforts to transform Canadian communities with buildings that are better for people and the planet. We believe green buildings are a powerful tool for making people healthier, communities more resilient, and reducing carbon emissions that cause global warming. CAGBC provides the building sector access to market-led research, leading green certification systems, verification services, and training, while advocating for the government programs, initiatives and policies needed to build our way forward to a more sustainable future.

OPEN Technologies

OPEN Technologies helps the people who shape our cities make informed climate change action decisions confidently. OPEN's software tools help to translate complex datasets into actionable data and metrics, which can provide the foundation to allow policy makers, investors, and the building owners achieve energy and carbon savings in their buildings, through collaboration with multiple stakeholders, OPEN is working on expanding the building industry's knowledge and shedding further light on building performance in Canada.

SPONSORS

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QuadReal™

2021 PARTICIPANT GROUP

QuadReal Property Group is a global real estate investment, operating and development company headquartered in Vancouver, British Columbia. Its assets under management total $67.1 billion. From its foundation in Canada as a full-service real estate operating company, QuadReal has expanded its capabilities to invest in equity and debt in both the public and private markets. QuadReal invests directly, via programmatic partnerships and through operating companies in which it holds an ownership interest. QuadReal seeks to deliver strong investment returns while creating sustainable environments that bring value to the people and communities it serves. Now and for generations to come.

QuadReal: Excellence lives here.

Triovest is an entrepreneurial leader in institutional real estate management, creating sustainable places that enhance communities and enrich relationships. Triovest's business platform offers advisory and investment management services with over $10 billion in assets under management and $2 billion in development. With offices in each major market across Canada, Triovest strives to combine local intelligence with deep expertise to drive superior returns.

Founded in 1989, Concert specializes in developing rental apartments, condominium homes and retirement communities, as well as acquiring and developing commercial, industrial and infrastructure properties. Concert prides itself on achieving excellence in property management across its portfolio. With operations across Canada and the backing of more than 200,000 Canadians represented by the union and management pension plans who own the organization, our commitment is to build strong, sustainable communities across Canada.

Colliers International is a global leader in commercial real estate services, providing a full suite of services across the industry. Colliers has grown to become one of Canada's leading commercial real estate firms and proudly remains Canadian-owned. As a third-party property manager, we strive to be leaders in advocating and executing sustainability initiatives in our managed properties on behalf of our clients. As a company, we are always looking to be enterprising and striving to be experts within our field.

The Minto Group is one of the premier real estate companies in Canada with a fully integrated real estate investment, development, and investment business platform. Since 1955, Minto has built more than 85,000 new homes, and currently manages more than 8,000 rental suites and 2.5 million square feet of office and retail space. Minto Group is proud to be a two-time winner of the Building Industry and Land Development Association's Green Builder of the Year award, a four-time winner of EnerQuality's Ontario Green Builder of the Year award and two-time winner of the Ontario Home Builder Association's Home Builder of the Year award. The company was also most recently named one of Canada's Greenest Employers for 2019.

KingSett Capital is a Canadian private equity real estate investment business which creates and co-invests in real estate investment solutions to deliver sustainable premium risk weighted returns. Founded in 2002, KingSett has raised $13.4 billion of equity for its Growth, Income, Urban, Mortgage and Affordable Housing strategies. KingSett has $17 billion of assets under management in a portfolio of $19 billion. KingSett is committed to investing in sustainable and innovative solutions that enhance communities, mitigate risk, and reduce environmental impact. To deliver results for investors, KingSett is implementing its ESG Strategy by integrating efficiency benchmarking in our business planning, capital investment, risk management and due diligence processes.

Brookfield Properties

Brookfield Properties is a leading global developer and operator of high-quality real estate assets. We are active in nearly all real estate sectors, including office, retail, multifamily, hospitality and logistics, operating more than 800 properties and over 375 million square feet of real estate in gateway markets on behalf of Brookfield Asset Management, one of the largest asset managers in the world. With a focus on sustainability, a commitment to excellence, and the drive for relentless innovation in the planning, development and management of buildings and their surroundings, Brookfield Properties is reimagining real estate from the ground up.

GOLDEN PROPERTIES

Golden Properties is a boutique family-owned property management company that has serviced the city of Vancouver since 1975. Our company owns and operates commercial office buildings nestled in the heart of Coal Harbour which offer stunning waterfront views of the Burrard Inlet. We maintain a sterling reputation for providing high-quality professional services to our tenants with a personal touch. By utilizing multiple retrofitting strategies like lighting solutions, chiller upgrades, and heat recovery technology, we have reduced our greenhouse gas emissions by almost 80 percent, and we are looking to go further.

SHAPE

SHAPE Properties is a real estate investment, development and management company leading some of the largest and most comprehensive projects in North America. With more than 370 acres in our growing portfolio, SHAPE currently manages +2.7M ft2 of commercial space with +3.5M ft2. of commercial and residential space under construction. As part of its sustainability mandate, Shape strives to implement sustainable design and environmental standards consistent with industry best practices including incorporating Leadership in Energy and Environmental Design (LEED) concepts and practices into projects and BOMA Best principles into its operations.

LaSalle™

As one of the world's leading real estate investment managers with more than $76 billion in assets under management, LaSalle recognizes that environmental performance has a material influence on investment performance and acts on this in several ways, including: using ENERGY STAR Portfolio Manager to benchmark and track our properties performance, achieving green building certifications, such as LEED, committing to industry moving initiatives such as the UN's Net Zero Asset Managers Initiative, and developing plans to reduce landlord-controlled operational carbon emissions to net zero by 2050. These actions helped to contribute to LaSalle Canada Property Fund's five-star rating in the 2021 Global Real Estate Sustainability Benchmark,

HUDSON PACIFIC PROPERTIES

Hudson Pacific Properties is a visionary real estate company publicly traded on the NYSE, with a portfolio of office and studio properties totalling over 20 million square feet and the NAIOP 2021 Developer of the Year. Focused on global epicentres of innovation, media, and technology, its anchor tenants include Fortune 500 and leading growth companies such as Google, Netflix, Riot Games, Square, Uber, etc.

Ottawa

The City of Ottawa is the municipal government of the nation's capital region. The City totals a population of one million residents and includes a large region inclusive of urban, suburban, and rural areas. The City has over 800 buildings of various types and uses, from pumping stations to recreation centres.

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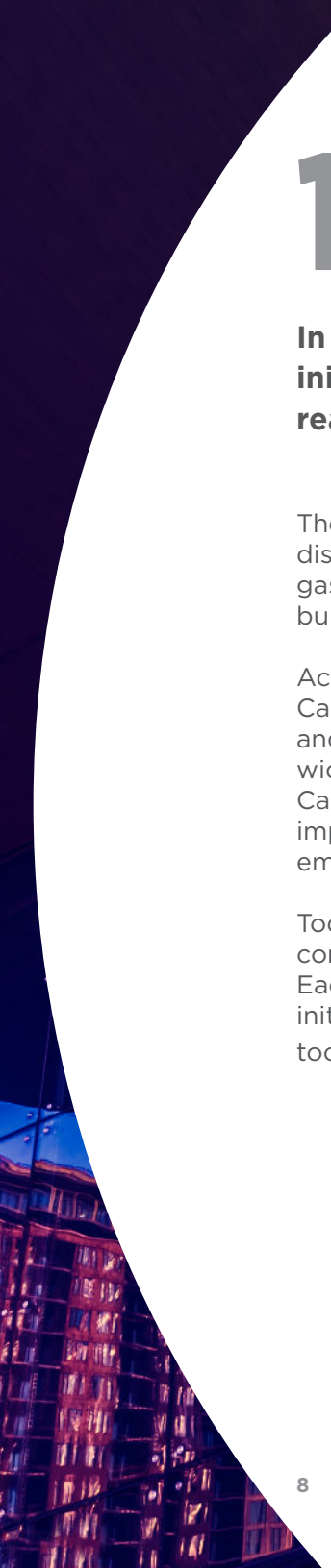


1 EXECUTIVE SUMMARY

In 2019, the Canada Green Building Council (CAGBC) launched the Disclosure Challenge, an initiative designed to encourage performance data accessibility and transparency in the Canadian real estate market.

The Challenge calls on real estate leaders to publicly disclose all their buildings' available energy, green house gas (GHG) emissions, and water data, regardless of the building's overall efficiency.

Accessible, whole-building energy use data can help Canadian building owners improve energy performance and achieve net-zero carbon operations. Without widespread reporting of energy use and related emissions, Canada's building sector will lack the insights needed to improve energy efficiency improvements and lower carbon emissions.

Today, the Challenge includes 12 portfolio owners with a combined $110 billion CAD in managed real estate assets. Each has made the commitment to bare all through this initiative to showcase that data transparency is a powerful tool and good for business.

In the absence of consistent requirements and support for building performance data disclosure and benchmarking, owners and operators, tenants, and policy-makers lack a clear picture of buildings' overall energy use and GHG emissions.

This report is an update to the previous *Full Disclosure* report. It adds data from new buildings and insights into 2020, a remarkable year of disruption for the real estate sector. The examination of the collective data and conversations with the participants provide the basis for this reports' key learnings and recommendations, which are summarized here:

KEY LEARNINGS

1. **The real estate sector is ready and willing to share building performance data.** Participants in the Challenge demonstrated there is an appetite for data transparency and willing sustainability leaders. Their involvement proves disclosure and data-sharing is possible for both public and private real estate managers anywhere in Canada.
2. **Barriers still exist, and more so for certain building types.** Industrial, warehouse and retail buildings have more challenges collecting whole-building data than multi-use residential buildings and offices and may need additional supports to meet their needs.
3. **Data drives emissions reductions.** The Challenge shows that data transparency and benchmarking can help guide energy and emissions reductions, and more broadly, can aid in the development of effective policies and programs.
4. **More jurisdictions are exploring whole-building data approaches.** Ontario already mandates energy and water reporting for some buildings, with cities like Edmonton, Winnipeg, Ottawa, and Montreal, and the Province of Nova Scotia exploring voluntary approaches.

RECOMMENDATIONS FOR POLICY-MAKERS

1. **Implement national building energy data disclosure guidelines** that align to the Disclosure Challenge's ask;
2. **Support the use of Energy Star Portfolio Manager** for data collection and benchmarking with direct connections to utility data;
3. **Mandate building data sharing** as a prerequisite to access support program approval; and,
4. **Develop a user-friendly system for energy efficiency and GHG emissions intensity labelling** that works for all buildings and owners.

By establishing disclosure and increased data transparency policies and procedures, Canada's building sector can uncover viable pathways towards high performance and low-carbon operations for all building types. Access to accurate and detailed performance data would result in better insights into operational performance and better guide investments in energy and deep carbon retrofits. By ensuring these foundational data points are available, it is possible we can supercharge Canada's retrofit economy, foster sector innovation, create jobs, and leave future generations with buildings that are better for both people and the planet.

2 Overview

The writing is on the wall. Canada's ambitious targets for reductions in greenhouse gas (GHGs) emissions must include a strategy for buildings, which today account for approximately 17 percent of all national GHG emissions.[1]

The Canadian building sector must fully commit to net-zero carbon building operations in line with government targets and societal expectations. However, achieving Canada's targets will require publicly accessible and effective disclosure of whole-building energy use data.

Accessible, whole-building energy use data can help Canadian building owners reduce energy use and achieve net-zero carbon operations. However, without widespread reporting of energy use and related emissions, policy-makers, owners, and investors will lack the insights needed to ramp up energy efficiency improvements and lower emissions.[2]

[1] *Canada's Pan Canadian Framework on Clean Growth and Climate Change* available at https://publications.gc.ca/collections/collection_2017/eccc/En4-294-2016-eng.pdf.

[2] Whole building energy use encompasses all energy consumed at a building, regardless of what party is responsible for the account, be it tenants, owners, or property managers.

In Canada, only the Province of Ontario requires the disclosure of building energy use under its Energy and Water Reporting and Benchmarking (EWRB) initiative, but it is applicable only to buildings over a certain size.[3] Ontario's data-sharing regulation enables building managers and consultants to collect annual energy use data directly from provincially regulated utility companies, providing a streamlined way to determine whole-building energy use and emission profiles.

Other Canadian jurisdictions such as the City of Edmonton, the City of Winnipeg, the City of Montreal, the City of Ottawa, and the Province of Nova Scotia have developed voluntary approaches to whole-building data. While a positive first step to support market development and benchmarking understanding, these voluntary programs lack the level of accessibility, data transparency, and consistency needed to drive meaningful retrofit activity. For the Canadian building sector to achieve deep and accelerated emissions reductions through retrofits, gaps in whole-building data must be addressed.

In 2019, the Canada Green Building Council (CAGBC) launched the Disclosure Challenge initiative to support data accessibility and transparency in the Canadian real estate market. The Challenge called on real-estate leaders to publicly disclose all their buildings' available energy, GHG emissions, and water data, regardless of the building's overall efficiency. The participants' commitment to the program demonstrated a heightened awareness of and need for, data transparency to help the real estate sector substantially reduce energy consumption and carbon emissions.

DISCLOSURE CHALLENGE PHASES

FIRST PHASE

5 participants
715 buildings
11 million m^2 of building space
$50 billion in managed real estate assets

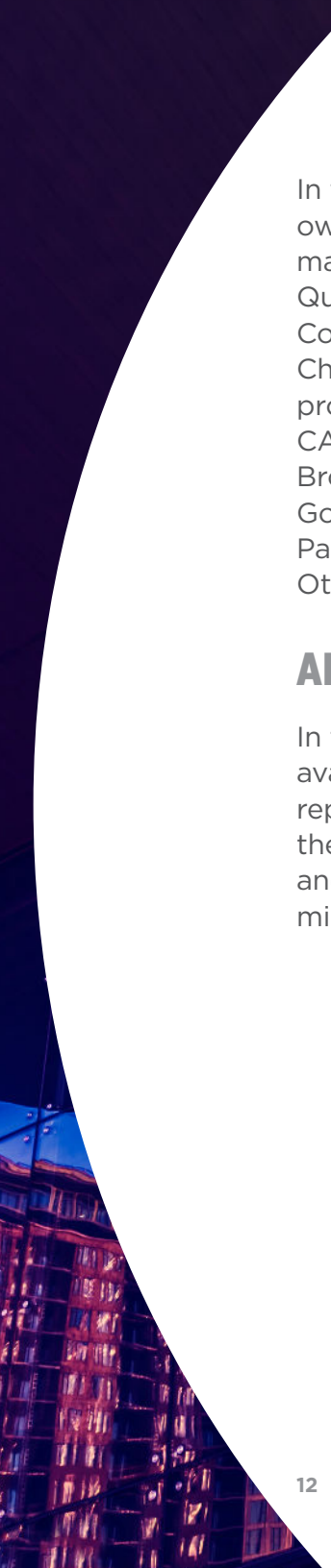
SECOND PHASE

10 participants
935 buildings
17.3 million m^2 of building space
$110 billion in managed real estate assets

THIRD PHASE

12 participants
914 buildings
17 million m^2 of building space
$110 billion in managed real estate assets

[3] See https://www.ontario.ca/page/report-energy-water-use-large-buildings. Accessed April, 2022



In the first year of the Challenge, five large portfolio owners with over $50 billion CAD combined in managed real estate assets participated, including QuadReal Group, Triovest, Concert Properties Ltd., Colliers International, and the Minto Group. In 2022, the Challenge grew to include six additional commercial property owners/managers representing $60 billion CAD in managed assets, including Kingsett Capital, Brookfield Properties, LaSalle Investment Management, Golden Properties, Shape Properties, and Hudson Pacific Properties, and one municipality, the City of Ottawa.

APPROACH

In the first year, Challenge participants disclosed available information from over 700 building assets representing over 11 million m2 of building space. For the years 2019 and 2020, data was collected on 935 and 914 buildings respectively, with approximately 17 million m2 of building space profiled each year.

The participants' building performance data was reviewed and validated for accuracy and then made publicly available through the Challenge's online visualization tool. Those buildings with complete performance data were graphically displayed in the tool and compared to overall national averages. The visualization tool can filter the displayed buildings based on type, age, energy efficiency ratings, GHG emissions intensity, and region. With this publicly available tool, CAGBC demonstrates how performance data can be effectively and dynamically shared when consistent data disclosure requirements are in place.

There are three years of data available within the tool, including during 2020, when the COVID-19 global pandemic directly impacted building occupancy. Through this data, the Challenge enabled real estate owners to identify trends and insights related to energy use in office and multi-residential buildings, including uncovering changing energy carbon intensity values for buildings in Alberta.

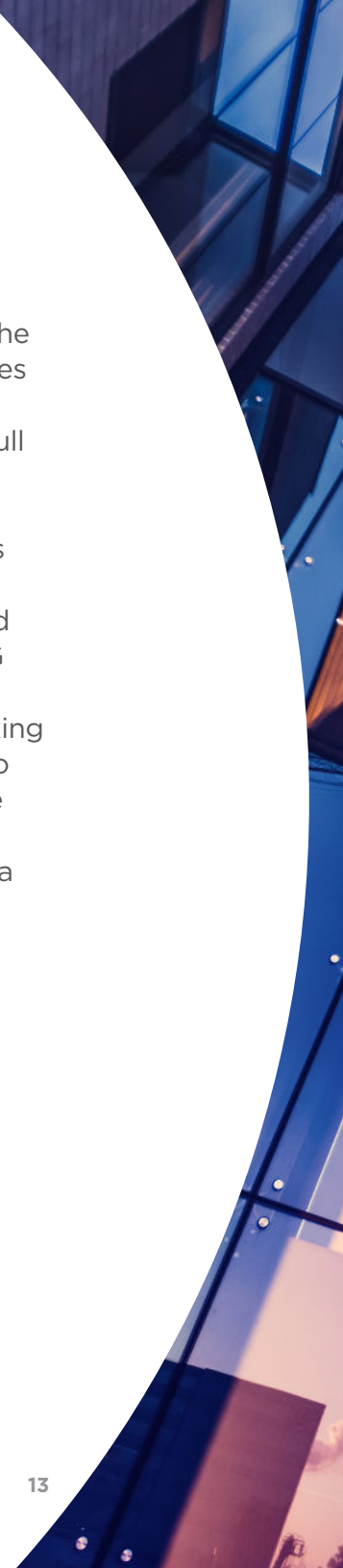
The involvement of real estate sector leaders in the Challenge helped to dispel the myth that the sector was reluctant to share data, helping put the real estate sector in a more positive light when it comes to sustainability leadership. In addition, the Challenge demonstrated that disclosure and data sharing is possible for public or private real estate managers in any jurisdiction in Canada.

ACCESSING WHOLE BUILDING DATA

Even when motivated participants want to collect and share data, there are barriers, especially for specific building types. Only a small portion of industrial and warehouse building types were able to submit complete whole-building performance information. It was also a consistent issue for retail buildings which encountered issues that included tenants paying their utility bills, campus-style energy distribution where one energy meter feeds multiple buildings, and a lack of direct data connections between the utility providers and data management systems.

Fortunately, while industrial and warehouses made up a significant portion of the total space, a greater percentage of the buildings in the Challenge were offices and multi-use residential buildings (MURBs), which generally did not experience these issues to the same degree. However, finding a solution that enables better whole-building data collection regardless of the building type will be important in ensuring the full benefits of data collection and monitoring.

Despite issues, the ongoing Challenge demonstrates how data transparency and data sharing can help the development of effective policies, programs, and actions to improve energy efficiency and lower GHG emissions. Globally, other jurisdictions are already taking advantage of data disclosure and benchmarking to identify opportunities for energy efficiency and to grow their retrofit economy. For Canada to replicate their success and supercharge the retrofit economy, reliable and consistent access to whole-building data across a wide range of building types is paramount.



3 Key Findings and Trends

REAL ESTATE SECTOR IS READY AND WILLING

From the beginning, the Challenge showcased the willingness of commercial real-estate leaders to share data and champion the need for improved data transparency.

> Ensuring that the information is accurate with minimal errors is a crucial component of any benchmarking and disclosure program.

By publicly sharing their portfolio data, these early adopters helped uncover the highest performing buildings as well as the laggards. The resulting insights enable owners to make informed decisions about investments in efficiencies, and can also help governments develop policies to support energy efficiency and GHG reduction.

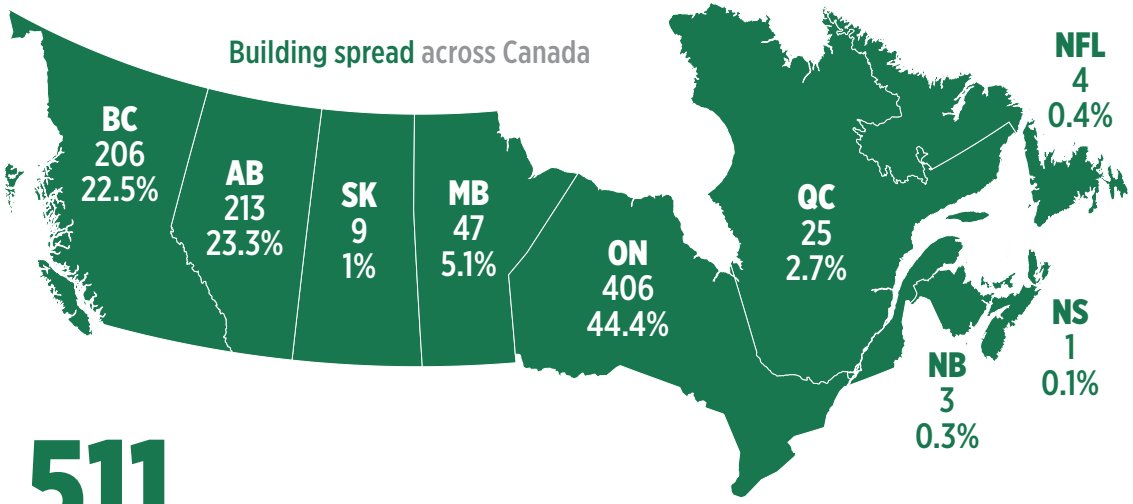
The Challenge required participants to provide all available performance data for buildings over 25,000 ft2, regardless of their overall efficiency. More specifically, participants agreed to disclose (at minimum) the following building profile and performance information for each building as available:

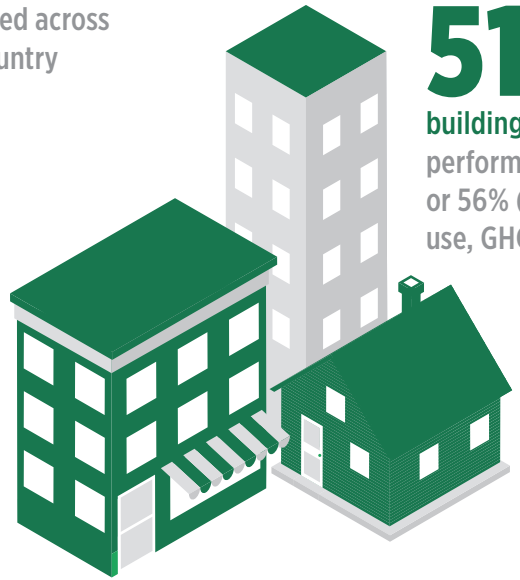
Building Profile Information	Main Performance Indicators
• Property/building name and location • Year of construction • Primary use type • Gross floor area (GFA) or lease area if GFA is not available	• Site Energy Use Intensity (EUI) (kWh/m^2/year) • Source EUI (kWh/m^2/year) • Greenhouse gas intensity (kgCO_2e/m^2/year) • Water use intensity (L/m^2/year) • ENERGY STAR® score (where applicable) • Any building certifications achieved (e.g., LEED, BOMA Best, Passive House, etc.)

WHAT'S NEW IN 2020

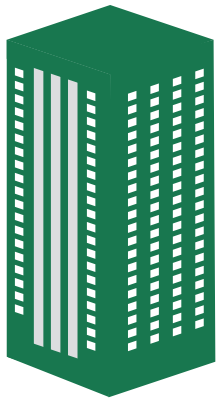
The global pandemic had a significant impact on the real estate sector as building occupancy plummeted during regional lockdowns. The summary below includes some of the key facts and insights derived from the 2020 disclosed building performance data:

914
building profiles provided across the country



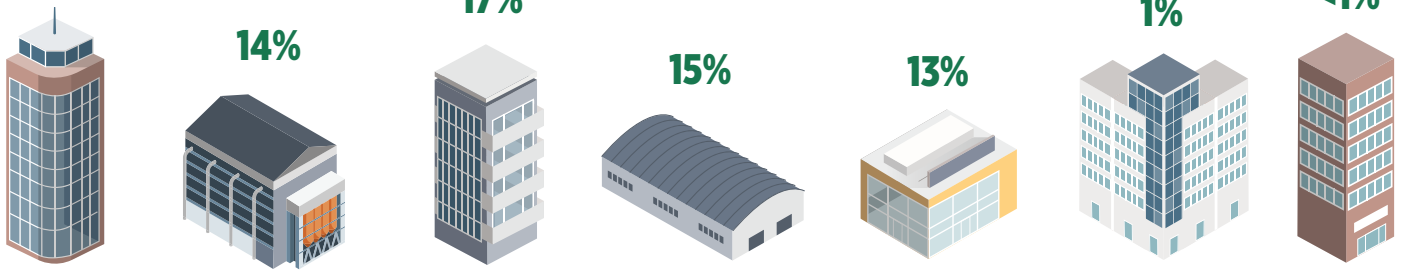


511
buildings with complete performance information or 56% (age, GFA, energy use, GHG emissions)

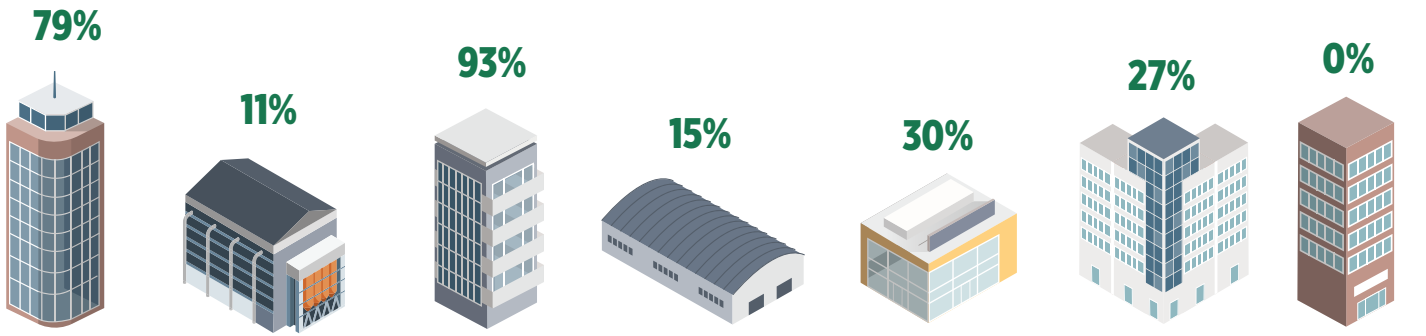


~17 million m² of building space (180 million ft²)
496 built pre-1990
418 built post 1990

BUILDING PROFILE DISTRIBUTION



FULL DATA DISTRIBUTION



In 2020, more complete performance data was available for office and multi-unit residential buildings (MURBs), as well as larger data sets for Alberta, British Columbia, and Ontario. The following insights for these building types were noted:

- For office buildings – Overall the median Site EUI was 242 kWh /m^2/yr for participant office buildings, which was better than the national median of 294 kWh/m^2/yr[4] or ~18% more energy efficient.[5]
- For MURBs – Overall, the median Site EUI was 240 kWh/m2/yr for participant multi-residential. National comparisons were not readily available for participant MURB buildings in 2020.
- GHG emissions intensity for both office and MURBs varied between regions.
  - For buildings in the Challenge from across the country, the median value for office buildings was 24 $kgCO_2e/m^2$/yr, and the median value for multi-residential buildings was 32 $kgCO_2e/m^2$/yr.
  - These values ranged from a high of 111 $kgCO_2e/m^2$ in Alberta to a low of 15 $kgCO_2e/m^2$/yr in British Columbia for office buildings, and a high of 65 $kgCO_2e/m^2$/yr in Alberta to a low of 25 $kgCO_2e/m^2$/yr in British Columbia for multi-residential buildings.
- Currently, there are only national median values for GHG emissions intensity for office buildings which can compare emissions performance. The median values vary significantly between regions and locations, due to the variety of energy utility providers and fuel sources used for electricity generation. Comparing participant office buildings to these median values indicated that they performed well, with 76% (220 out of 289) that were lower than the national GHG emission intensity median value.
- Age of the buildings indicates that median site EUIs have improved for office buildings over time, due to improvements in design and construction, while MURBs demonstrated a decrease in energy efficiency:
  - Offices pre-1990 buildings (190) = 257 kWh/m^2/yr, post-1990 bldgs (105) = 213 kWh/m^2/yr (17% improvement);
  - Multi-residential pre-1990 buildings (94) = 234 kWh/m^2/yr, post-1990 bldgs (49) = 256 kWh/m^2/yr (9% decrease).

[4] NRCan, http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/showTable.cfm?type=SC&sector=AAA&juris=CA&rn=1&page=2. Accessed April 2022.
[5] Energy Use Intensity (EUI) is the measurement of total annual energy use at a building divided by the building's size.

- To provide existing performance context, the Energy Step Code in British Columbia and the Zero Emissions Framework in the City of Toronto propose an EUI of 100 kWh/m2 as a standard to use for new high-performance office and MURBs within their phased approaches.[6] Compared to the existing buildings in the Challenge, this change represents a reduction of 58% for both office buildings and multi-residential buildings.

2020 ENERGY EFFICIENCY AND EMISSIONS INSIGHTS

During the Challenge, it was observed that the overall efficiency and emissions intensity for office buildings across the country improved as illustrated in the next table. However, building occupancy and usage patterns for 2020 were not typical to previous years, and as a result, further study of performance trends will be required as these buildings return to more normal operating occupancy conditions.

Office - Median and Weather Normalized Values

2018	2019	2020
275 kWh/m²/yr	258 kWh/m²/yr	250 kWh/m²/yr
30 $kgCO_2e/m^2/yr$	26 $kgCO_2e/m^2/yr$	24 $kgCO_2e/m^2/yr$

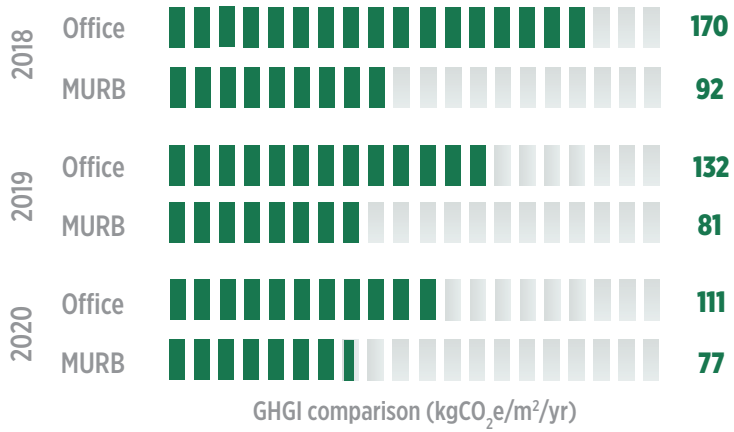
MURBs – Median and Weather Normalized Values

2018	2019	2020
260 kWh/m²/yr	255 kWh/m²/yr	250 kWh/m²/yr
37 $kgCO_2e/m^2/yr$	34 $kgCO_2e/m^2/yr$	32 $kgCO_2e/m^2/yr$

[6] For information on the BC Energy Step Code see https://energystepcode.ca/. Accessed April 2022 for the for the Toronto Zero Emissions Framework see https://www.toronto.ca/wp-content/uploads/2017/11/9875-Zero-Emissions-Buildings-Framework-Report.pdf. Accessed April 2022.

One observed improvement in the Challenge buildings was the reduced carbon intensity of energy consumed in Alberta buildings between 2018 and 2020. During the first year of the Challenge, energy carbon intensities for Alberta buildings were the highest among all participants. Although the carbon intensity remained higher in 2020, the gap between regions dropped significantly. The overall electricity and natural gas use patterns for both office and MURBs remained relatively consistent over the course of the Challenge, indicating that this carbon intensity reduction was not significantly driven by fuel switching activities but rather by reduced emissions associated with electricity generation. The Alberta data from the Challenge shows how Alberta buildings are benefiting from the province's decarbonization efforts. As the electrical grid in Alberta is further decarbonized, buildings in that region could further reduce emissions through the transition of space heating and other building systems to less carbon-intensive fuel sources.

Alberta GHG Intensity Comparison



Alberta Energy Usage Comparison

	2018		2019		2020	
	Elec	Nat Gas	Elec	Nat Gas	Elec	Nat Gas
Office	46.5%	53.5%	45.0%	55.0%	44.3%	55.7%
MURB	23.3%	76.7%	19.2%	80.8%	18.8%	81.2%

4 Building Performance During COVID Shutdowns

In March 2020, the disruption and changes in occupant patterns created by the COVID-19 pandemic were significant.

Work from home requirements for most sectors emptied office buildings, resulting in more people at home and reduced foot traffic at retail locations. Even with these disruptions, all building types were always "on," requiring energy and water, and contributing to GHG emissions. The 2020 Challenge data offered additional insights during an unprecedented change in occupancy patterns for buildings.

Reviewing the performance of office buildings with energy use data available for each of the three years of the Challenge indicated that buildings performed exceptionally well, with an average reduction of 8.6 percent in normalized energy use in 2020 compared to their average of 2019 and 2018. This is detailed in the next table.

Of the 128 buildings that showed consistent use in 2018 and 2019[7], there were 106 that had efficiency improvements or no change and 22 that had increased energy use in 2020. For the 106 buildings with reductions, the average improvement was 12.4 percent, while for the 22 buildings where energy use increased, the average increase was 8.1 percent. The office buildings that were able to reduce energy use due to lower occupancy rates in 2020 compared to previous years illustrate the ability of these buildings to adapt their operations to changing use patterns.

	Number of buildings	Average Change 2020 vs 2019 & 2018	Median Change 2020 vs 2019 & 2018
Full data set	128	-8.6 %	-9.4 %
Bldgs. with decreases	106	-12.4 %	-11.3 %
Bldgs. with increases	22	+8.1%	+7.6 %

[7] For comparison purposes office buildings with consistent normalized energy use for 2019 and 2018 (± 20%) were included in the 2020 analyses.

The results for MURBs were more varied than for office buildings. Overall, normalized energy use increased by 1.8 percent in 2020 compared to the average of the previous two years, with a median decrease of 0.6 percent for the same data set.[8] These results are detailed in the following table.

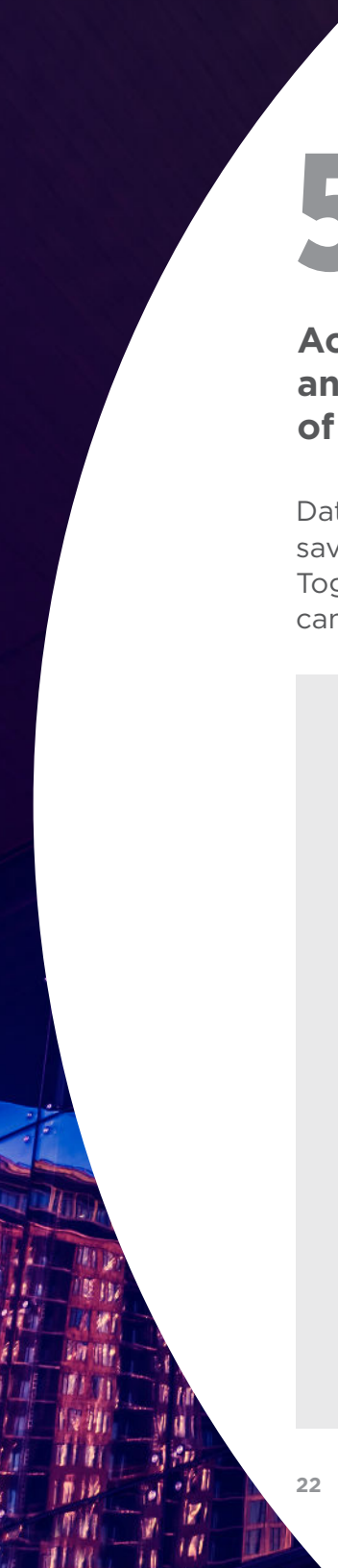
Of the 81 buildings that showed consistent use in 2018 and 2019, there were 46 that saw energy use reductions or no change and 35 that had increased energy use in 2020. For the 46 buildings with reductions, the average improvement was 5.2 percent, while for the 35 buildings where energy use increased, the average increase was 10.9 percent. The high average increase in energy use observed for the 35 buildings was due to a few properties that saw a greater than 40 percent increase in energy use. The median increase for this data set was 5.3 percent.

	Number of buildings	Average Change 2020 vs 2019 & 2018	Median Change 2020 vs 2019 & 2018
Full data set	81	+1.8 %	-0.6 %
Bldgs. with decreases	46	-5.2 %	-3.5 %
Bldgs. with increases	35	+10.9%	+5.3 %

The significant increase in energy use that some MURBs experienced in 2020 might indicate they were being operated as efficiently as possible prior to occupant hours increasing as people began working from home. The control capabilities afforded to building tenants and operators likely affected how much the increased occupancy hours impacted the energy used to keep the building ventilated, heated and/or cooled.

With the use of advanced building automation systems, experienced operators, and data-driven system changes, owners, and operators can quickly adjust critical systems and schedules depending on changing occupant and weather patterns. Understanding achievable performance levels for different building types will ultimately help to establish market-driven solutions to increase efficiency and reduce emissions.

[8] Like office buildings, for comparison purposes only buildings with consistent normalized energy use for 2019 and 2018 (± 20%) were included in the 2020 analyses.



5 Data Drives Emissions Reductions

Achieving emissions reductions at scale in Canada's building sector requires owners and operators to upgrade, retrofit, and ultimately decarbonize hundreds of millions of square metres of building space.

Data on actual building performance, energy-use profiles, retrofit project costs, achievable energy and cost savings, and lifecycle-based emission reduction opportunities will be critical to this decarbonization process. Together, access to this data will enable owners, operators, and tenants to make market-based decisions that can cost-effectively improve building performance and reduce carbon emissions.

GOLDEN PROPERTIES

The Golden Properties building at 1177 West Hastings in Vancouver BC, highlighted the opportunity to combine equipment renewal with emissions reduction goals. The project sought to achieve Zero Carbon Building – Performance Standard certification for its 27-storey class-A office building, constructed in 1968, through the implementation of a long-term transition plan. The transition planning included a review of operational performance data and aligned needed equipment renewal activities with low carbon and high-efficient options.

By completing a holistic and comprehensive deep carbon retrofit that included replacing the original chillers with a higher efficiency plant and heat recovery system, upgrading the building's automation system to optimize operations, installing variable speed drives on all building pumps water system and fans, converting the domestic hot from natural gas to electricity, and replacing the in-efficient lighting system with a high-efficiency smart control LED system, the building was able to achieve a 67 percent reduction in energy use and an 80 percent reduction in emissions. Golden Properties has also made the commitment to promote and share its data and experiences on the development and execution of its zero-carbon transition project so that other organizations can benefit and use this project as a guide for their own zero carbon project development activities.

Canada's targets for carbon reduction have given urgency to needed changes in how we build, retrofit, and manage buildings. Many jurisdictions are introducing emissions and energy performance requirements. As the cost of carbon rises, institutional investors need data transparency to reduce carbon risk. Consistent disclosure programs offer access to the metrics needed to meet new monitoring and reporting demands and to identify improvements in building efficiency. Without timely, accurate, consistent, and verified data, building-related emissions reduction at scale will not be achievable or effective at guiding investment decisions that support carbon emissions reduction. Without data, achieving high-performance building operations in Canada will be challenging.

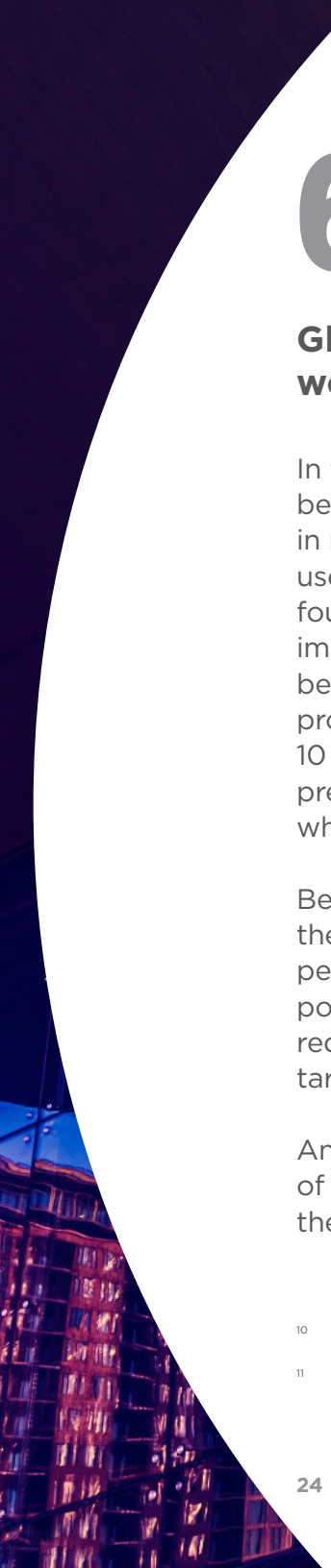
CAGBC's Disclosure Challenge case studies showcase how participants used whole-building data to improve performance and reduce emissions. Each highlighted project required consistent and accurate performance data and detailed project information to develop low-carbon and energy efficiency retrofit options. Timely and accurate performance data is also crucial if owners and managers are to effectively respond to key business and market decision drivers, such as tenant performance demands and market expectations.

The need for consistent and transparent data to support increased retrofit activity in the Canadian real-estate sector was highlighted in CAGBC's comprehensive study entitled, "*Decarbonizing Canada's Large Buildings*." The study identified that access to better data and awareness of actual performance and exemplary retrofit projects would help building owners, investors, policy-makers, and other stakeholders pursue deep carbon retrofits. Implementing mandatory energy rating and disclosure programs were among the study recommendations and are necessary steps if we are to supercharge the Canadian retrofit economy.[9]

Accurate, industry-wide performance data and comprehensive project information will also enable owners and operators to implement the long-term transition plans needed for cost-effective system replacements and low-carbon operations. The longer industry and governments delay development of transition plans, the more expensive the transition to zero carbon operations will be. We must act now to ensure the best possible business case for all deep carbon building retrofits.

> Not only at an industry level, but also on a building-by-building basis, owners, stakeholders, and investors need the information details to make informed decisions that maximize building system investments.

[9] See https://www.cagbc.org/news-resources/research-and-reports/decarbonizing-canadas-large-buildings/. Accessed April 2022.



6 Disclosure, Benchmarking and Labelling Are All Needed

Global examples show that implementing benchmarking and disclosure programs would support building performance improvements in Canada.

In the United States, more than 30 cities have benchmarking and transparency regulations, resulting in reductions of between two to 14 percent in energy use, energy costs, or energy intensity over a two to four-year time frame.[10] These reductions and efficiency improvements are notable on their own. Still, it has been demonstrated that energy-efficient buildings also provide added market value, benefiting from up to 10 percent higher occupancy rates, 10 percent higher premiums on rents, and 25 percent higher sales prices when compared to less efficient buildings.[11]

Benchmarking and disclosure are just two of the support mechanisms that can enable high-performance building operations. Complementary policies such as energy audits and retro-commissioning requirements, building retrofit codes, and performance target regulations offer other avenues.

Another way to facilitate wider adoption and uptake of whole-building data collection and disclosure in the real estate sector is by requiring standardized building performance labelling. The potential for this mechanism to be used in the Canadian market context was discussed and assessed as part of the 2021 Challenge initiative activities.

Challenge participants agreed that there is market value in efficiency and/or low carbon building labelling depending on the metrics used. Participants believed that increased opportunities for recognition through labelling would support market differentiating for high-performance buildings and drive improvements and retrofit activity. The real estate sector is moving away from simple energy efficiency evaluations towards more comprehensive GHG emissions and holistic sustainability-based evaluations which can be more readily discerned and supported through labelling programs and data sharing and disclosure requirements.

Ultimately, labelling needs to be easily understood and valued by tenants, occupants, and owners from the largest commercial owners to the smallest.

[10] Evaluation of U.S. Building Energy Benchmarking and Transparency Programs: Attributes, Impacts and Best Practices https://eta-publications.lbl.gov/sites/default/files/lbnl_benchmarking_final_050417_0.pdf.

[11] Ibid.

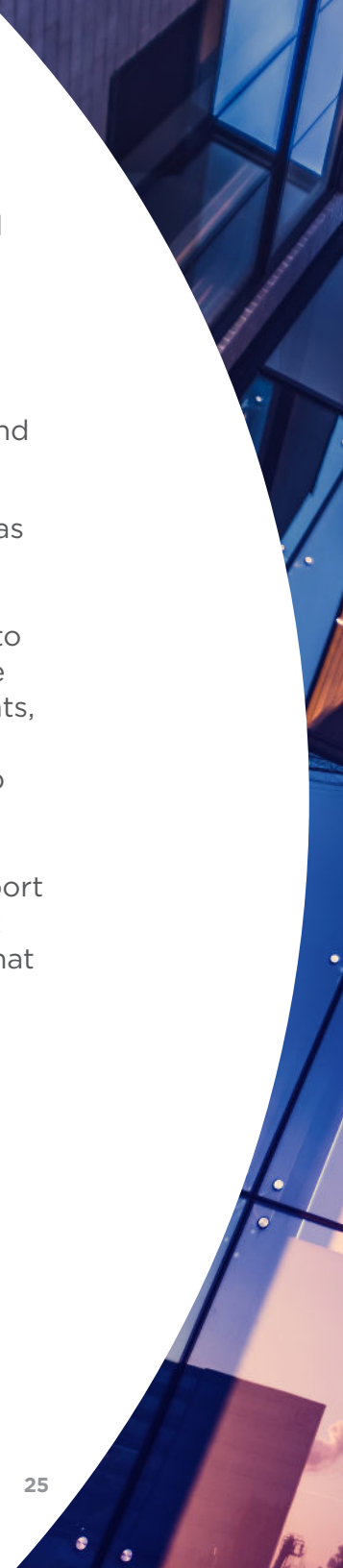
Data collection and labelling must become part of normal and expected building operations. For instance, since building managers are already accustomed and experienced with labels and efficiency certifications such as Energy Star™ for building equipment and components, expanding it to include the building performance overall would be a reasonable industry evolution.

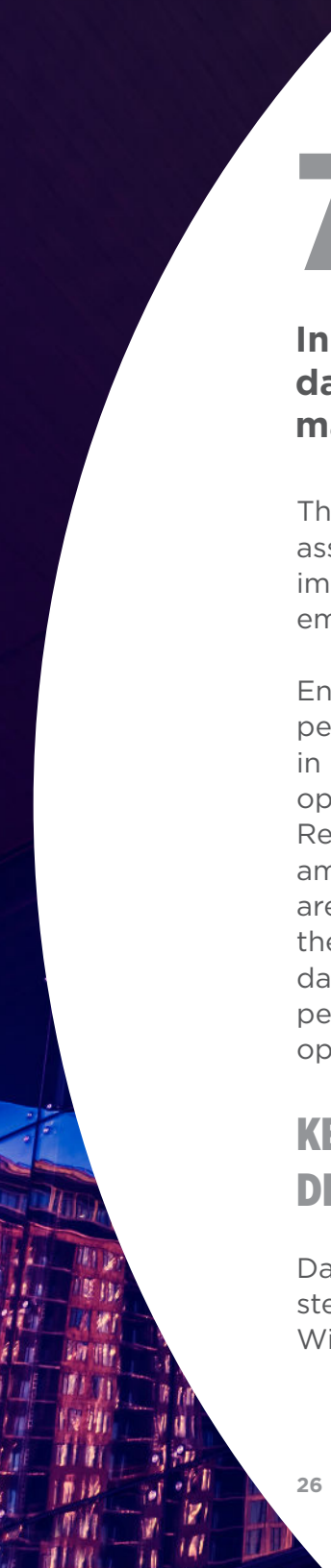
However, ensuring that the performance benefits are maximized will require labelling initiatives to be developed in consultation with stakeholders and owners, and consider that owners of B and C class buildings may need supports beyond those required by the largest commercial owners. This consultation would help guide the policy and requirements and enable buy-in from the building sector.

Other high-performance building labelling program considerations include:

- Utilize standardized data requirements and uniform data sets as the labelling backbone;
- Enable direct connections with utility data and other energy management information-sharing platforms;
- Consider implementing requirements at the provincial level so that participation is expected and comprehensive in large jurisdictions, as well as tying labelling requirements to building performance targets;
- Enable program uptake and compliance by providing comprehensive participant support and resources; and,
- Ensure any program or label is as independent as possible and verifiable and trusted.

Given that the real estate sector is rapidly shifting to more holistic environmental, social and governance (ESG) reporting and data transparency requirements, labelling may be less impactful in driving market activity. On the other hand, as jurisdictions develop building performance requirements and emissions targets, supporting high-performance building recognition and differentiation could increase support from building owners and operators, and fast-track public appreciation for the performance benefits that these requirements can achieve.





7 The Path Forward

In the absence of consistent requirements and support for building performance data disclosure and benchmarking, owners and operators, tenants, and policy-makers lack a clear picture of buildings' overall energy use and GHG emissions.

This blind spot hampers environmental footprint assessments and the development of plans to improve the energy efficiency and lower the emissions profiles of Canada's buildings.

Ensuring access to accurate and detailed performance data for all building types would result in better insights into operational performance, operational drivers, and high-performance thresholds. Regulations, reporting frameworks (such as GRESB among others,) and/or tenant and owner demands are raising performance expectations and making them a part of normal building operations. As a result, data-driven insights will be critical in identifying performance requirement levels and setting operational targets on a building-by-building basis.

KEY CONSIDERATIONS FOR FULL DISCLOSURE

Data transparency and benchmarking are a crucial steppingstone to a decarbonized built environment. With greater levels of data transparency, new opportunities for building performance analysis would be gained. Increased transparency and data sharing would also support the development of new and innovative policies and programs that could drive change at scale. Key recommendations for governments to consider include the following:

1. Implement national building energy data disclosure guidelines that align to the Disclosure Challenge's ask;
2. Support the use of Energy Star Portfolio Manager for data collection and benchmarking and require direct connections to utility data to make collection and sharing of data easier;
3. Mandate building data sharing as a prerequisite to associated support program approval; and,
4. Develop a user-friendly system for energy efficiency and GHG emissions intensity labelling that works for all buildings and owners.

Establishing a common building data, labelling and transparency approach is a step that building owners, occupiers and policy-makers must take together.

By collecting and sharing data, we can develop a deeper understanding of what performance levels are achievable by building type. The Disclosure Challenge participants showed us that insights gained at the building level and compared with a broader sample size, can help inform and advance performance improvement decisions. As the building sector works toward meeting its commitments under Canada's climate action targets, performance improvements in existing buildings will be critical to achieving significant reductions in carbon emissions.

By establishing disclosure and increased data transparency policies and procedures, Canada's building sector can uncover viable pathways towards high performance and low-carbon operations for all building types. Backed by data, the resulting boom in deep carbon retrofit activity will foster sector innovation, create jobs, and leave future generations with buildings that are better for both people and the planet.