How energy and carbon intensive is your office building?

Compare with others in British Columbia

PUMA Benchmarking Summary
For BC Office Buildings: Calendar Year 2022

PUMA™
PUMA Utility Monitoring Inc.

Scope

The sites included in this benchmarking report are from the following clients that subscribed to monthly PUMA utility monitoring software and services during the calendar year 2022 or had energy or low carbon electrification audits carried out by Prism Engineering.

Geography: All buildings included in this report are from Coastal BC regions, including the Lower Mainland, Victoria, and Nanaimo.

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About PUMA

PUMA comprises a combination of software and services that track over 23,000 electrical, natural gas, water, and other fuel accounts for government, commercial, and institutional customers. Since launching online in 2009, more and more organizations have enlisted PUMA to help track and analyze building energy use.

PUMA is currently used by over 20 Energy Managers, and more than 60 organizations across Canada. Our utility tracking software and services save time and money for owners of multiple properties by turning data into actionable information.

About this Report

Each year the PUMA team puts together a benchmarking report for school districts, advanced education, office buildings and local governments. Based on compiled data from PUMA, this report enables the comparison of similar sites across each sector.

www.pumautilitymonitoring.ca

2022 Office Building Benchmarks

This benchmarking report compiles data from fifty-three (53) buildings managed by fifteen (15) property management or owner companies and analyses the reductions needed for compliance to reduce carbon pollution limits.

The data set is separated into three categories based on the size of the buildings: small, medium, and large.

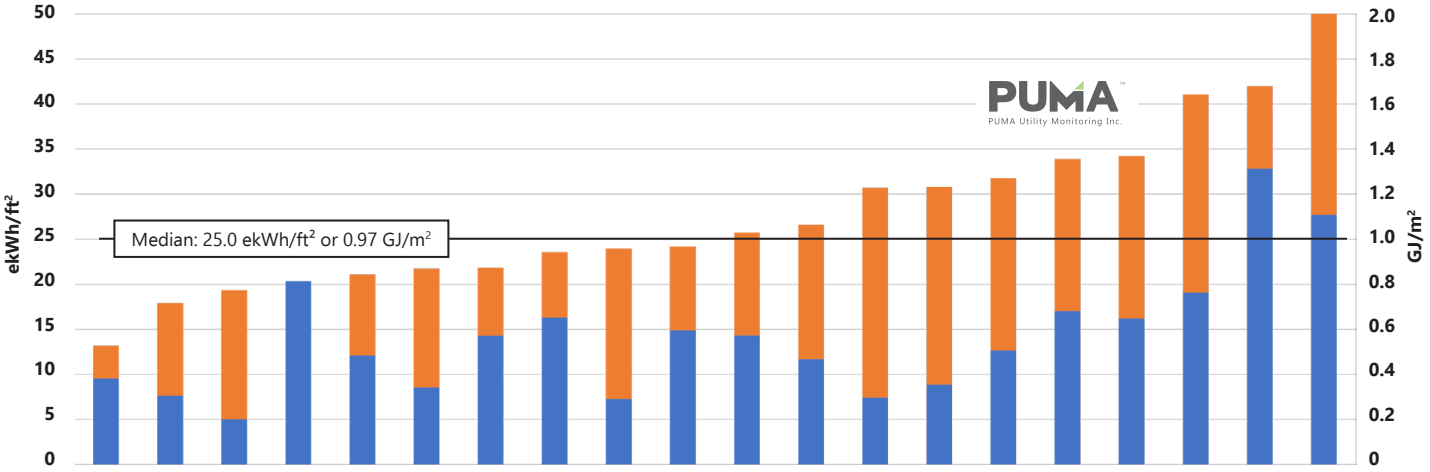
Small-sized office buildings	25,000 ft^2 to 50,000 ft^2 / 2,322 m^2 to 4,645 m^2
Medium-sized office buildings	50,000 ft^2 to 100,000 ft^2 / 4,645 m^2 to 9,290 m^2
Large-sized office buildings	≥100,000 ft^2 / 9,290 m^2

How **energy and carbon intensive** is your office building ?

Based upon your Energy Use Intensity (EUI)

SMALL-SIZED OFFICE BUILDINGS EUI calendar year 2022

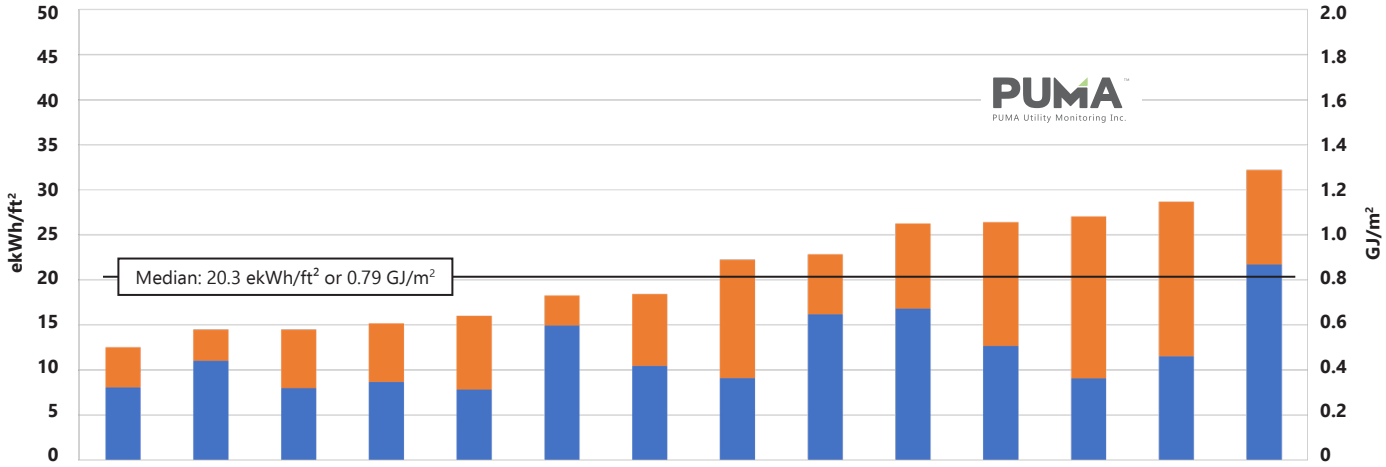
20 Offices



The small building dataset of 20 buildings has the highest energy use intensity (EUI) of three size groups. Building systems may not be as efficient and there may be less focus on efficiency upgrades for this building set.

MEDIUM-SIZED OFFICE BUILDINGS EUI calendar year 2022

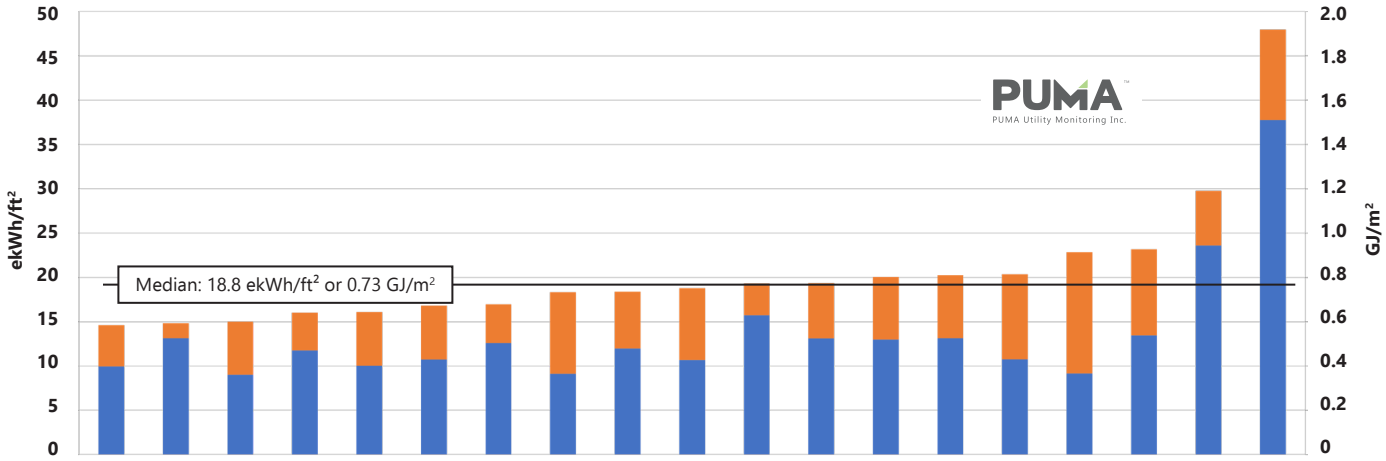
14 Offices



This data set compares fourteen medium-sized buildings. The highest energy use building uses approximately three times the energy of the lowest building.

LARGE-SIZED OFFICE BUILDINGS EUI calendar year 2022

19 Offices



Note that the highest energy use building has a large data centre causing the highest intensity in this group.

How carbon intensive is your office building?

In April 2022 Vancouver City Council approved **Annual Carbon Pollution Limits and Reporting for Existing Large Commercial and Multi-family Buildings** to advance the Climate Emergency Action Plan.

The Council report introduces reduction limits on the largest office and retail buildings in Vancouver. This will limit the amount of GHG emissions (GHGi) and heating energy for these building types and require "building owners and energy utilities to plan for deep emission retrofits and investments in renewable energy, including renewable gas and low carbon district energy."

Other regions and cities, like Metro Vancouver, are considering GHGi and heating energy limits for their regions.

Read the regulations here:

Carbon pollution limits and reporting for existing large commercial and multi-family buildings

vancouver.ca/green-vancouver/green-large-commercial-and-multi-family-buildings.aspx

City of Vancouver Pollution Reduction Requirements

GHGi: The intensity of total GHG emissions per unit area from energy use in the building.

PHASE 1 — 25 kg CO_2e/m^2 in 2026 for large-sized buildings and in 2030 for medium-sized buildings

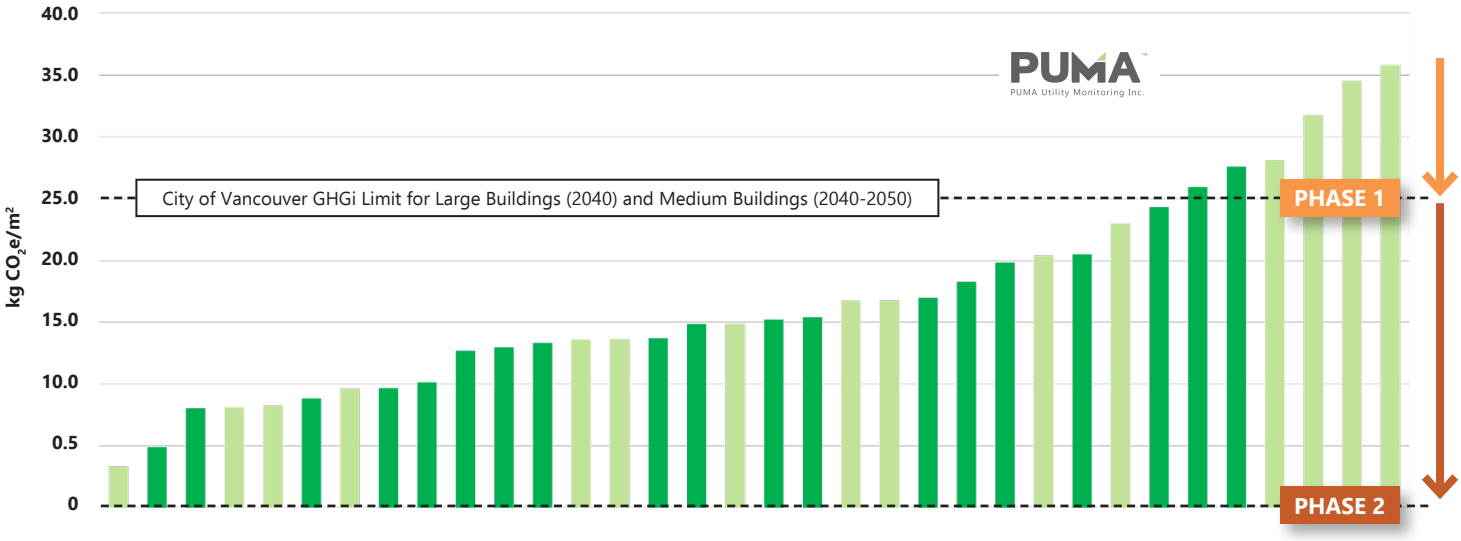
PHASE 2 — 0 kg CO_2e/m^2 in 2040 for large-sized buildings, and between 2040 and 2050 (tbd) for medium-sized buildings

Heating energy-use: The natural gas and district energy use per unit area in the building regardless of the carbon intensity.

By 2040, both building sizes must reduce their fuel consumption to 0.09 GJ/m^2.

The following charts show how buildings across the lower mainland measure in relation to the City of Vancouver Pollution Reduction Limits.

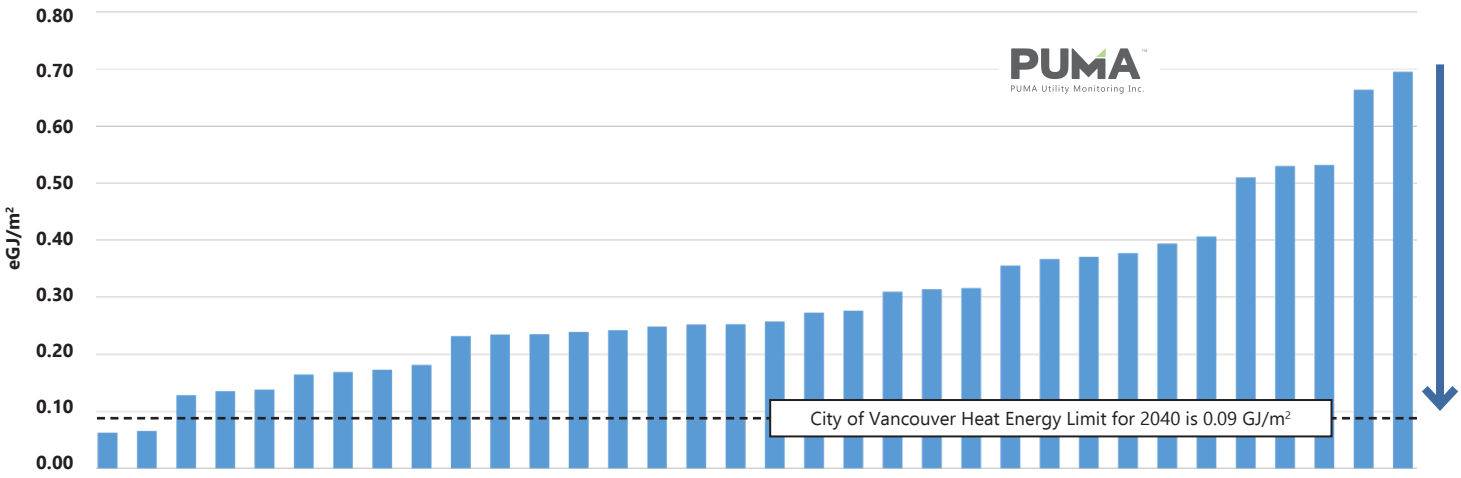
EMISSIONS INTENSITY BASED UPON TOTAL ENERGY USE GHGi calendar year 2022



73% of medium-sized buildings and 89% of large-sized buildings currently meet **PHASE 1** of City of Vancouver's GHGi limits set for 2026 (for medium-sized) and 2030 (for large-sized).

Medium-sized buildings
Large-sized buildings

HEATING ENERGY-USE FUEL CONSUMPTION FOR MEDIUM-SIZED AND LARGE-SIZED BUILDINGS



More than 90% of the buildings in this dataset of large and medium buildings do not currently meet the Heat Energy limits. **As the report states:** "This limit will ensure buildings start planning, investing in, and implementing energy conserving practices and significant energy efficiency retrofits as cost effective opportunities arise prior to 2040."

2022 Average Energy Use Intensity Summary

Building Size (Quantity)	Median ekWh/ft² in 2020	Median ekWh/ft² in 2021	Median ekWh/ft² in 2022
Large (19)	21.8	21.9	18.8
Medium (14)	21.0	21.3	20.3
Small (20)	24.7	25.4	25.0
Total (53)	**22.7**	**23.1**	**21.4**

If a building uses more than the median, it could be a good candidate for energy saving opportunities. If it uses less than the median, it may be a good example of energy efficiency leadership. Looking closely at where a building fits in the distribution may be more informative in many cases.

Weather Data

The figures on the preceding pages are computed without weather or location adjustment for simplicity of comparison and are based on billed energy use. PUMA incorporates local weather data so that weather adjusted savings and weather normalized figures can be easily calculated. Contact us for more details.

BOMA Utrack utility tracking system powered by PUMA

BOMA BC members get preferred pricing on PUMA through their Utrack offer.

PUMA is an affordable and effective way to compare the performance of all the buildings in your portfolio, including the ability to normalize for weather.

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