10th Annual

How energy and carbon intensive is your school district?

Compare with others in British Columbia

10th Annual PUMA Benchmarking Summary
For BC School Districts: Calendar Year 2022

PUMA™
PUMA Utility Monitoring Inc.

Scope

The sites included in the benchmarks are from the following BC School Districts that subscribed to monthly PUMA utility monitoring software and services during the calendar year 2022.

Coastal

Interior & North

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.

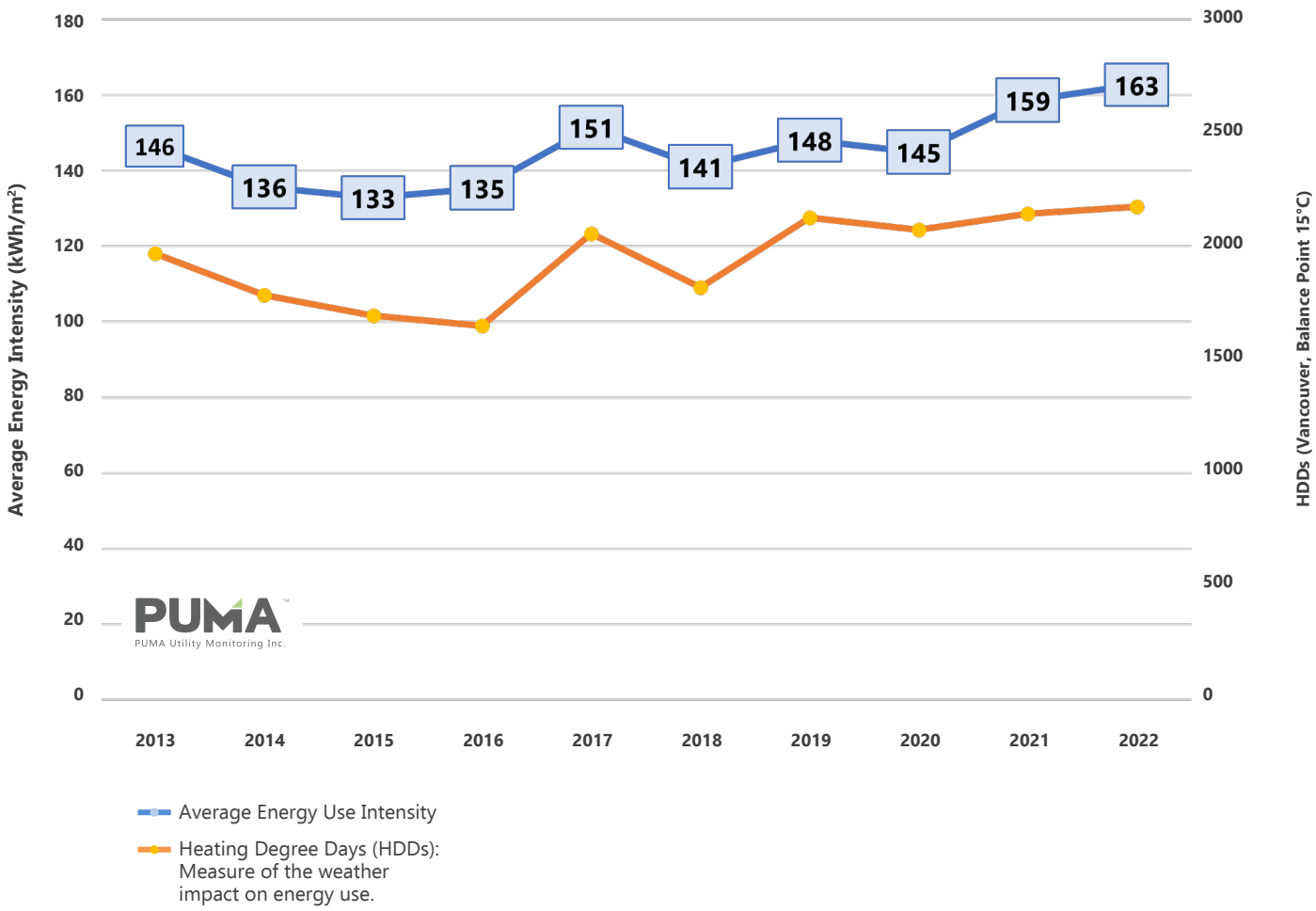
www.pumautilitymonitoring.ca

COVID-19 and 2022 Benchmarks

With COVID-19 ventilation rate changes persisting through 2022, energy use changes in our buildings also persist. We have continued to quantify this impact to help our clients understand both increases and decreases in energy use. We believe our presentation in April 2021 on how our techniques can reveal the scale of changes remains relevant to our understanding of our energy use patterns in 2022.

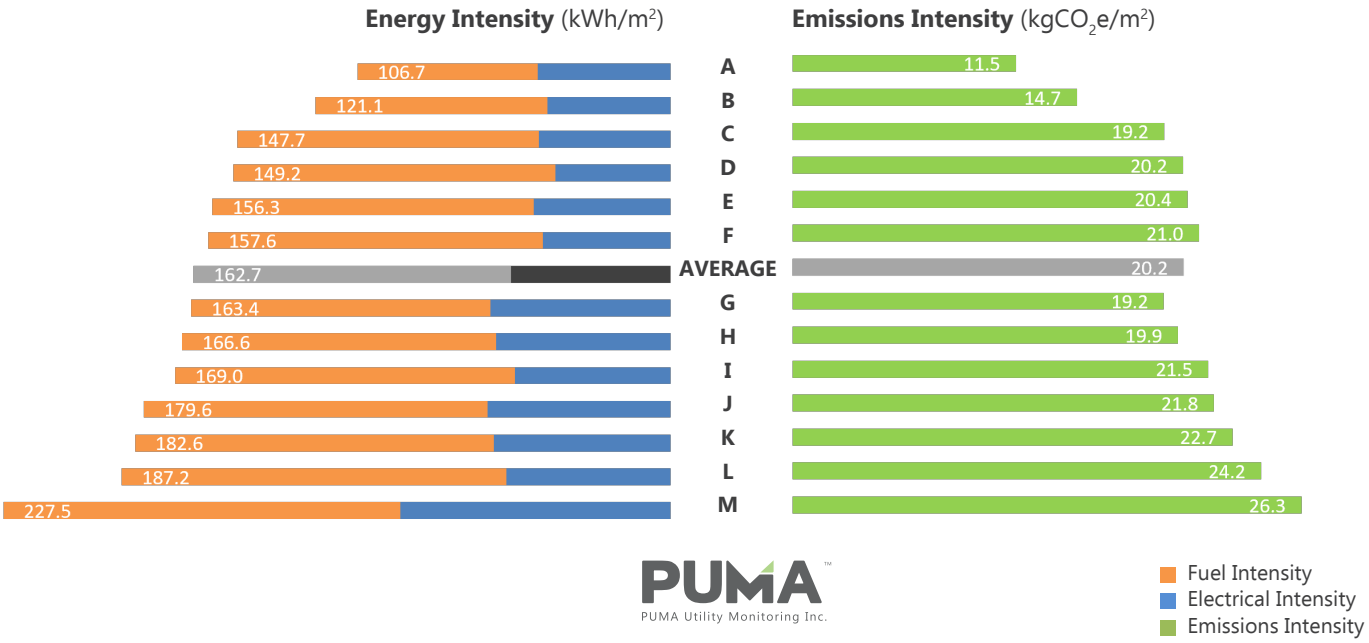
Since Benchmarking compares buildings during the same time period, and the behaviour changes made in 2020 persisted across the sample area – British Columbia – the comparison between how buildings performed remains valid. It is visible in the chart below as an increase in EUI from 145 ekWh/m^2 to 163 ekWh/m2 between 2020 and 2022, years that otherwise had similar HDDs. With the significant changes we have all experienced over the past 3 years, the history of average performance provides important context and is shown below for this sector.

COASTAL SCHOOL DISTRICTS Average Energy Use Intensity Over 10 Years

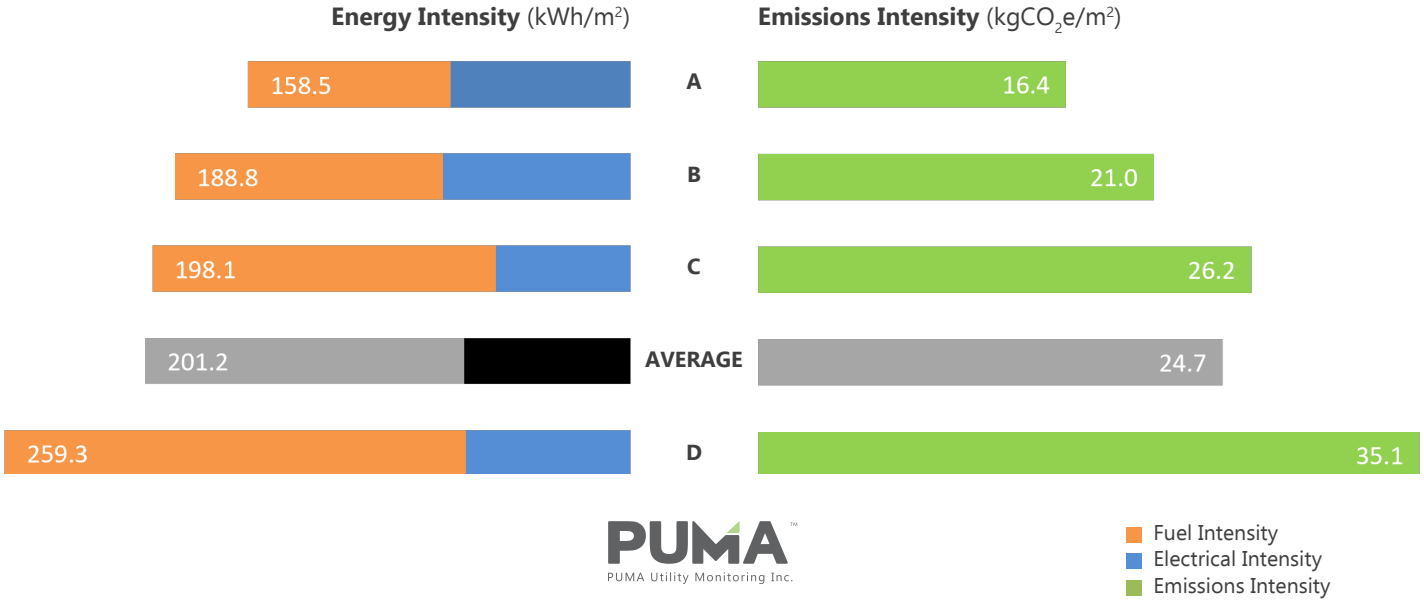


How **energy and carbon intensive** is your school district?

FOR 13 COASTAL BC SCHOOL DISTRICTS Calendar Year 2022

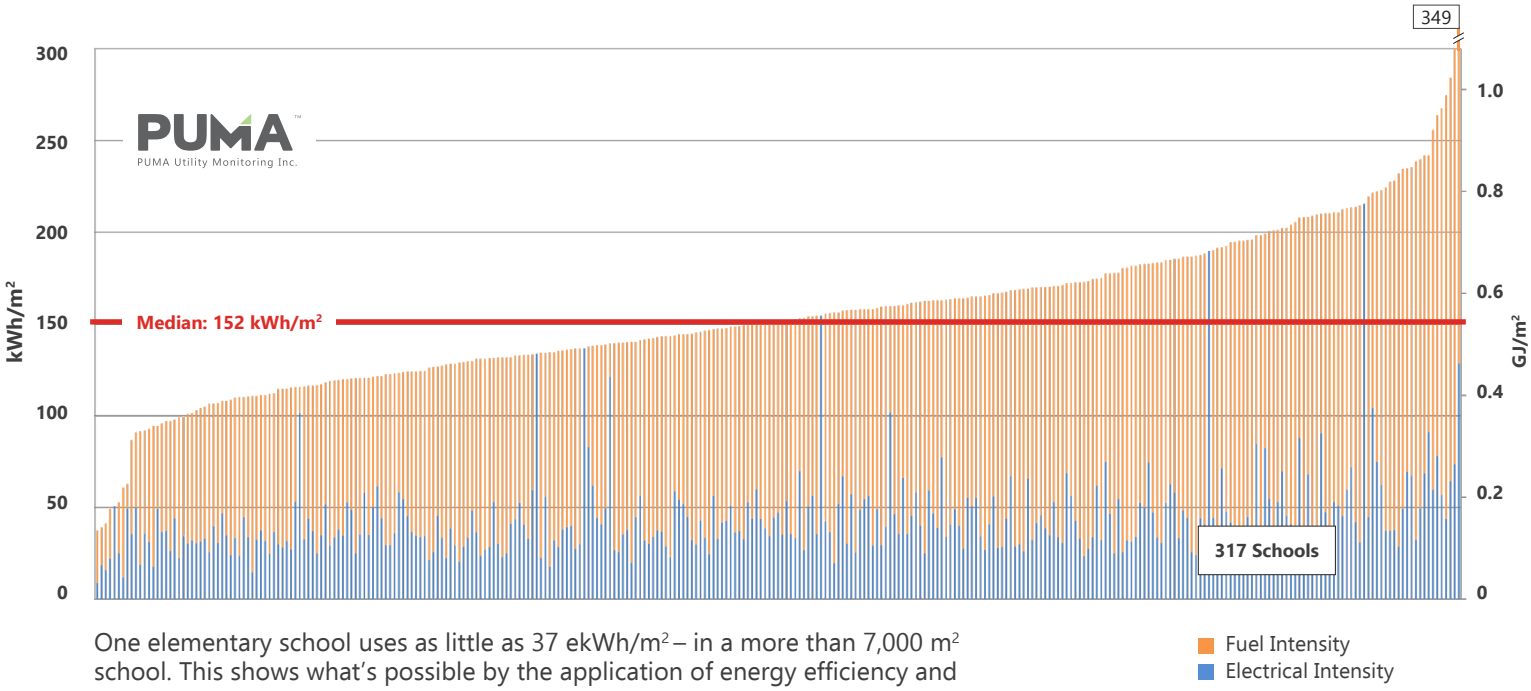


FOR 4 INTERIOR & NORTHERN BC SCHOOL DISTRICTS Calendar Year 2022



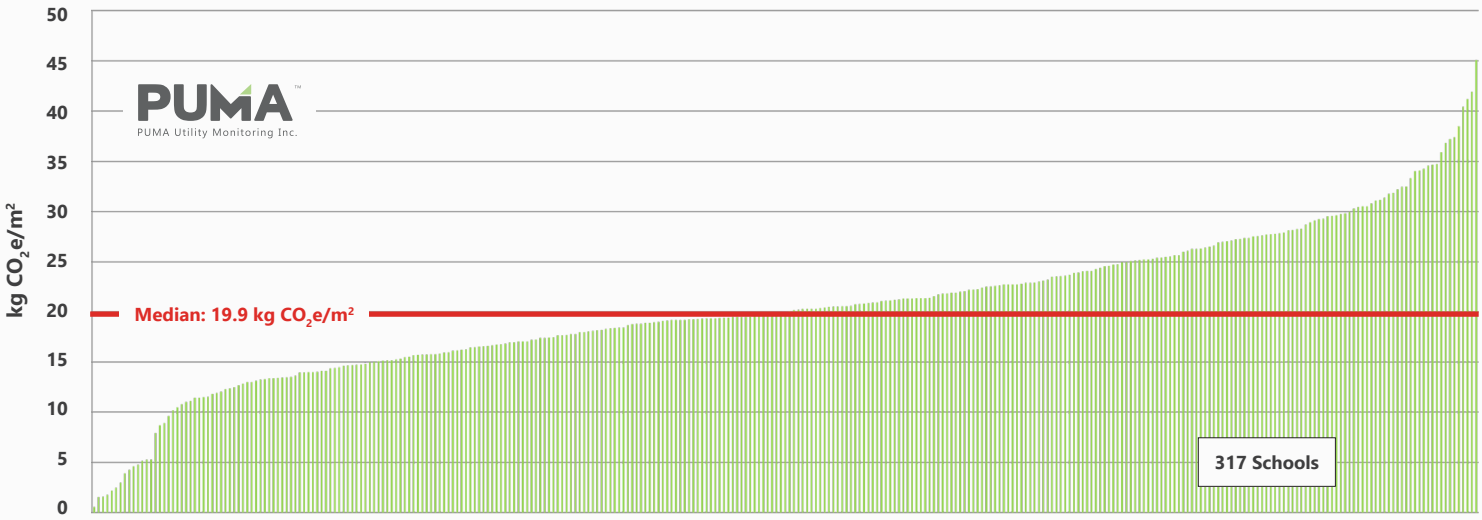
Are your **elementary schools** better or worse compared to other schools in BC?

COASTAL BC ELEMENTARY SCHOOLS EUI Calendar Year 2022



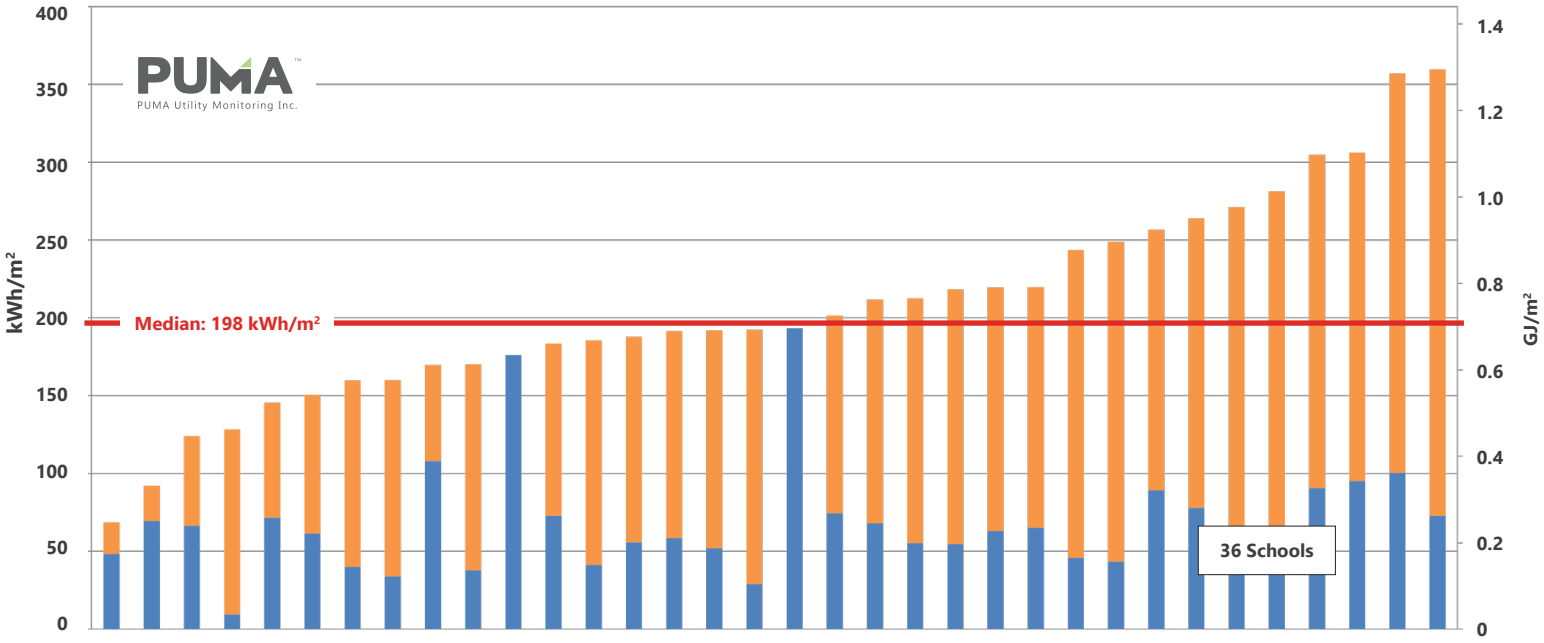
One elementary school uses as little as 37 ekWh/m² – in a more than 7,000 m² school. This shows what's possible by the application of energy efficiency and solar PV to offset annual use. That is 1/10th the energy used by the most energy intense elementary school in coastal BC.

COASTAL BC ELEMENTARY SCHOOLS GHGi Calendar Year 2022



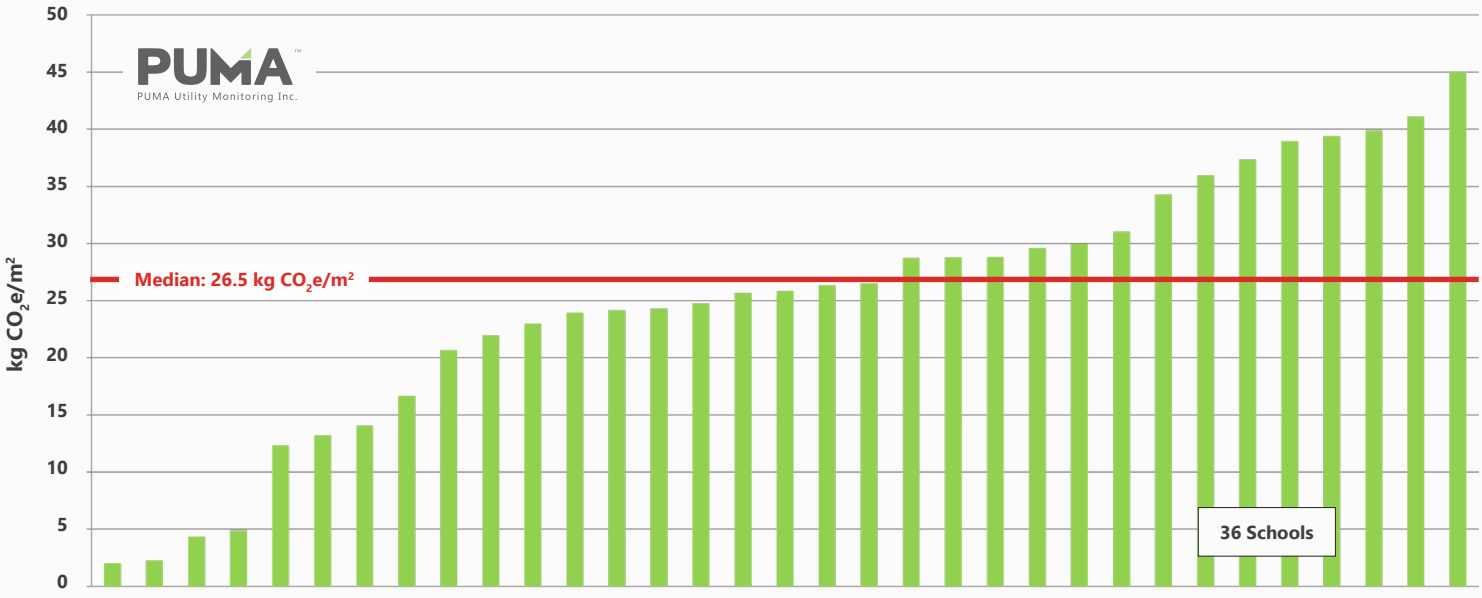
On an intensity basis, 20 elementary schools emit half of the median emissions. That is less than a quarter of the highest emission schools.

INTERIOR BC ELEMENTARY SCHOOLS EUI Calendar Year 2022



At 198 kWh/m^2, the 2022 interior and northern median is 3.5% higher than the 2021 median and 30% higher than the coastal elementary school median. The best performing elementary school used less than 1/5th the energy of the most energy intensive school.

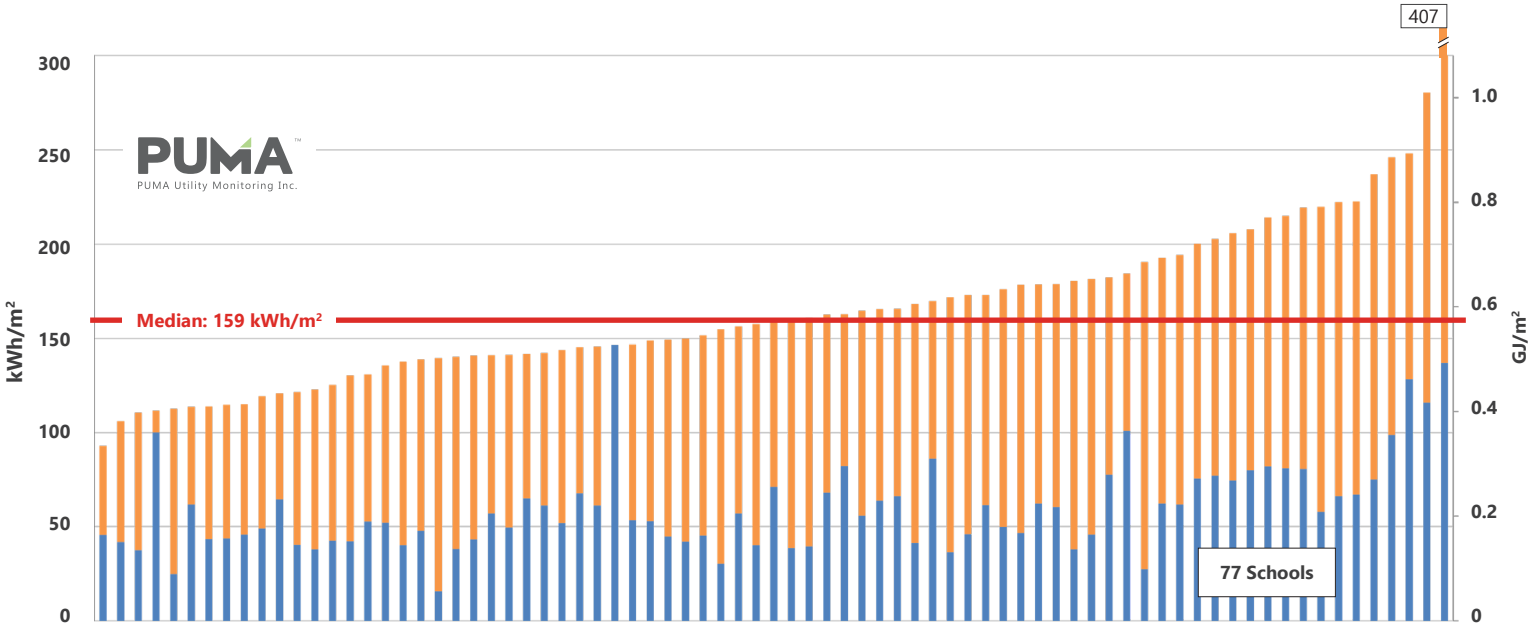
INTERIOR BC ELEMENTARY SCHOOLS GHGi Calendar Year 2022



Schools in colder regions have approximately 25% higher emissions intensity than those in coastal regions. Note that two school are all electric and produce less than 10% of the median emissions.

Are your **secondary schools** better or worse compared to other schools in BC?

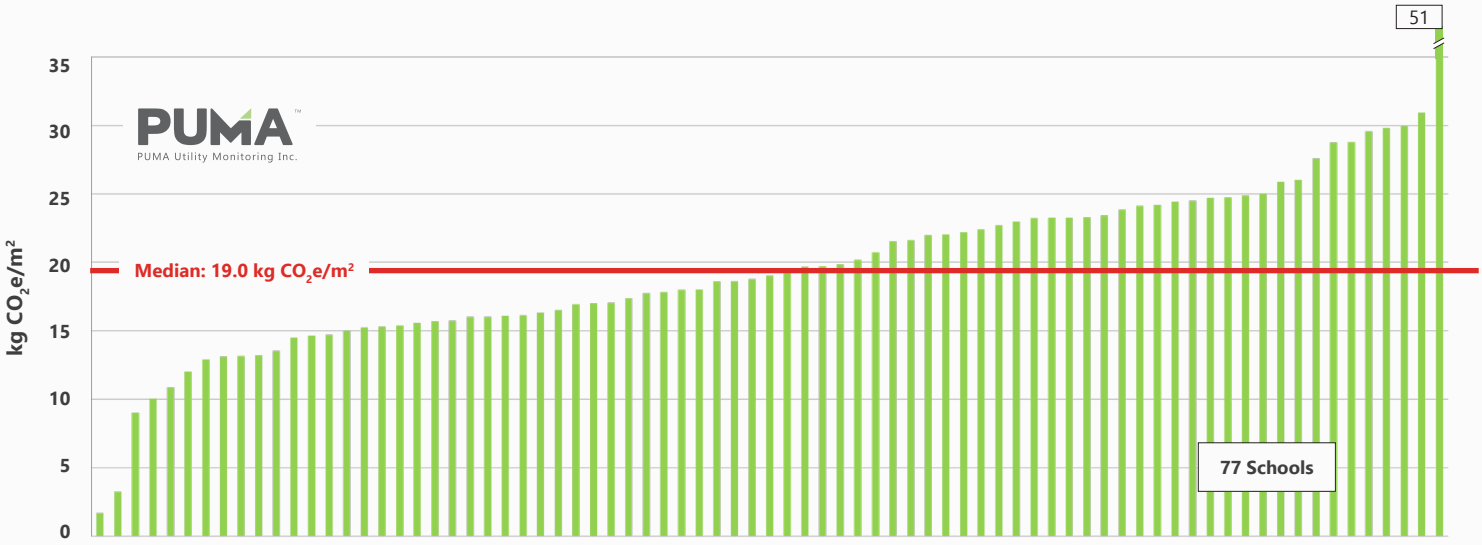
COASTAL BC SECONDARY SCHOOLS EUI Calendar Year 2022



At 159 kWh/m^2, the secondary school median is 11% more than in 2019 (similar weather years).

Fuel Intensity
Electrical Intensity

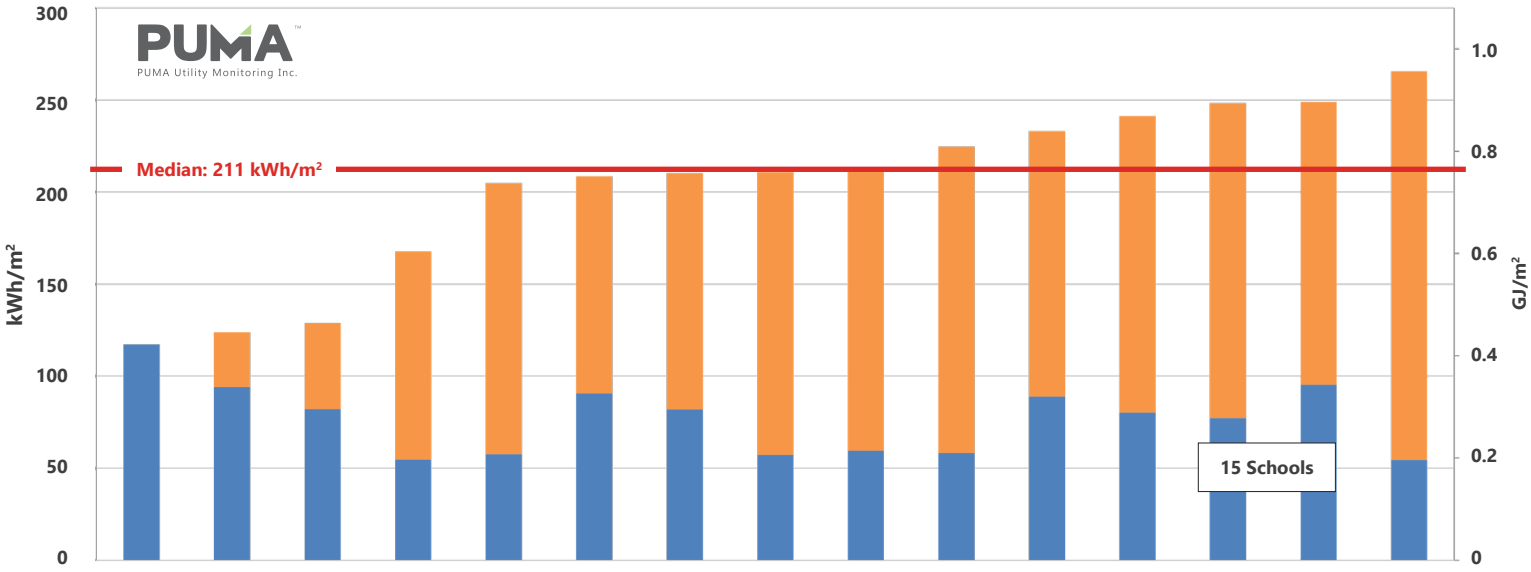
COASTAL BC SECONDARY SCHOOLS GHGi Calendar Year 2022



One major high school emits less than one tenth per square meter than the highest intensity secondary schools – leading the way to what is possible.

Emissions Intensity

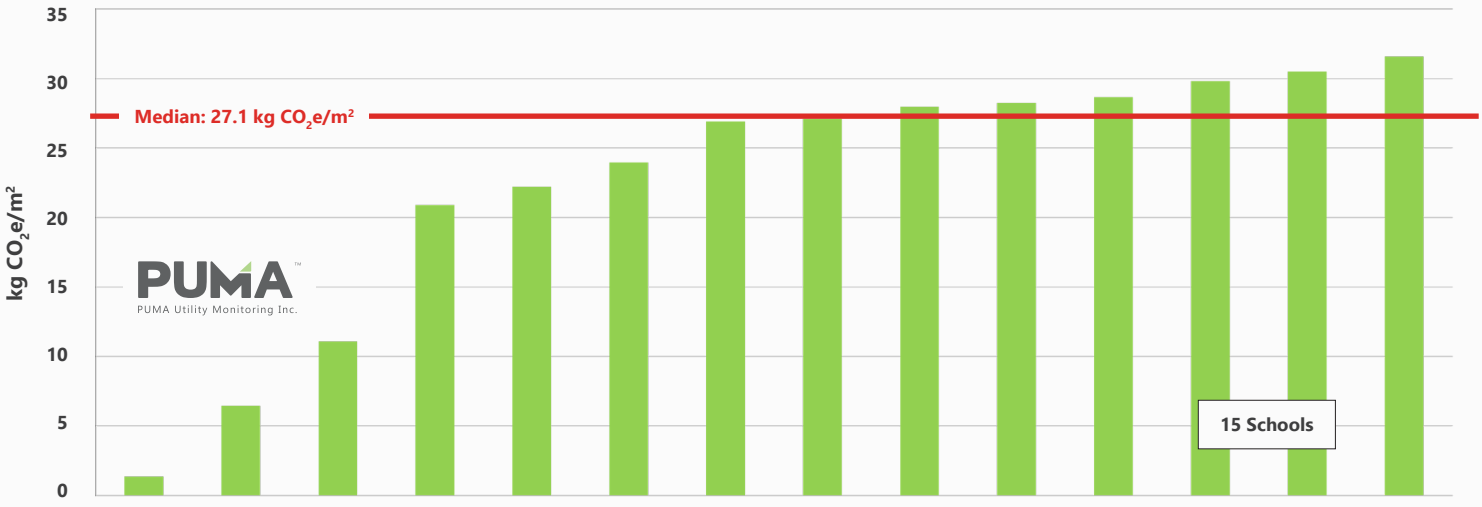
INTERIOR BC SECONDARY SCHOOLS EUI Calendar Year 2022



At 211 kWh/m², the 2022 interior and northern median is 33% higher than the coastal secondary school median.

Fuel Intensity
Electrical Intensity

INTERIOR BC SECONDARY SCHOOLS GHGi Calendar Year 2022

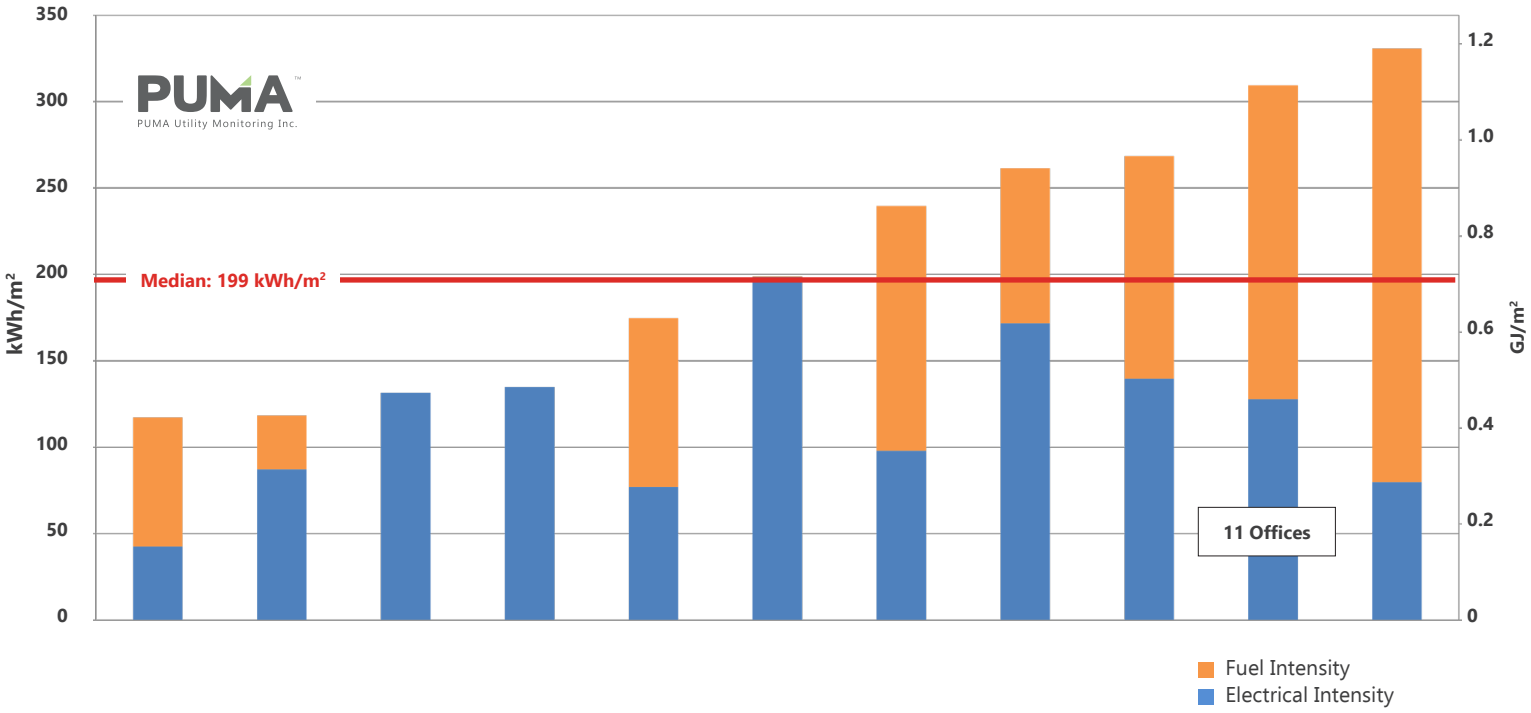


Although most schools operate close to the median, 3 schools show much lower emissions and what is possible

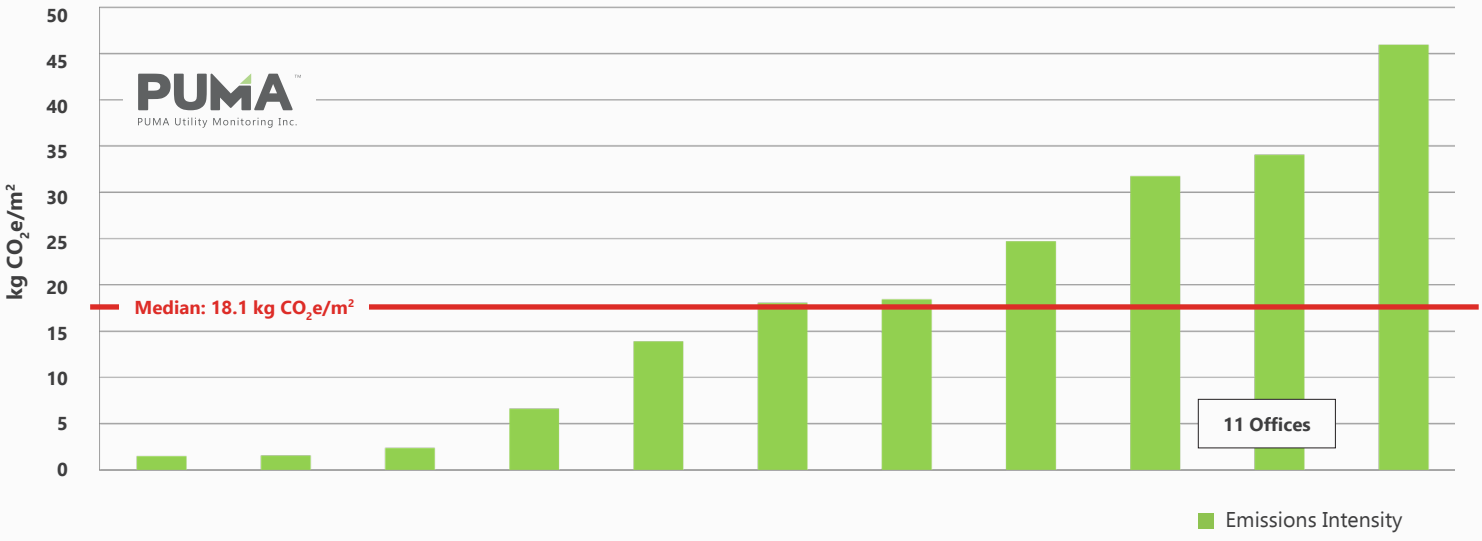
Emissions Intensity

Are your **board offices** better or worse compared to others in BC?

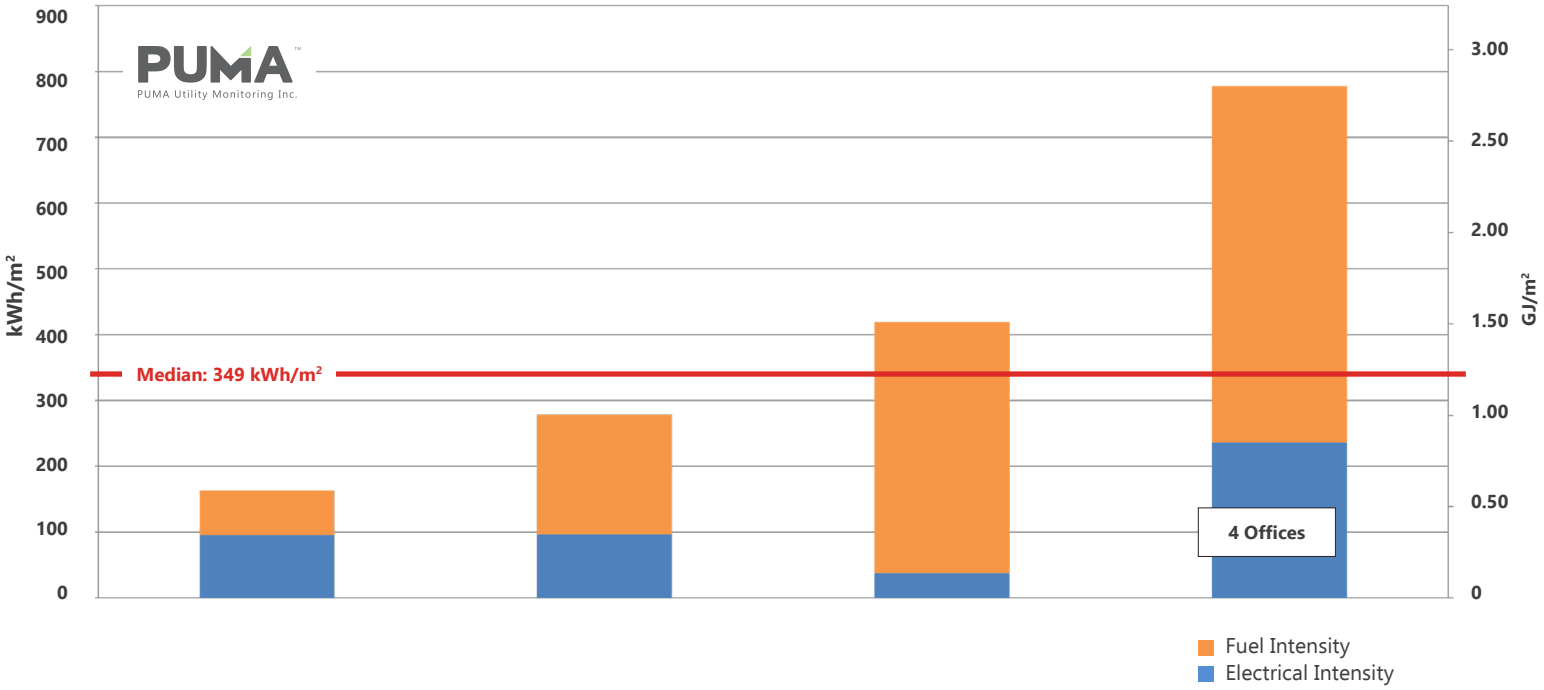
COASTAL BC BOARD OFFICES EUI Calendar Year 2022



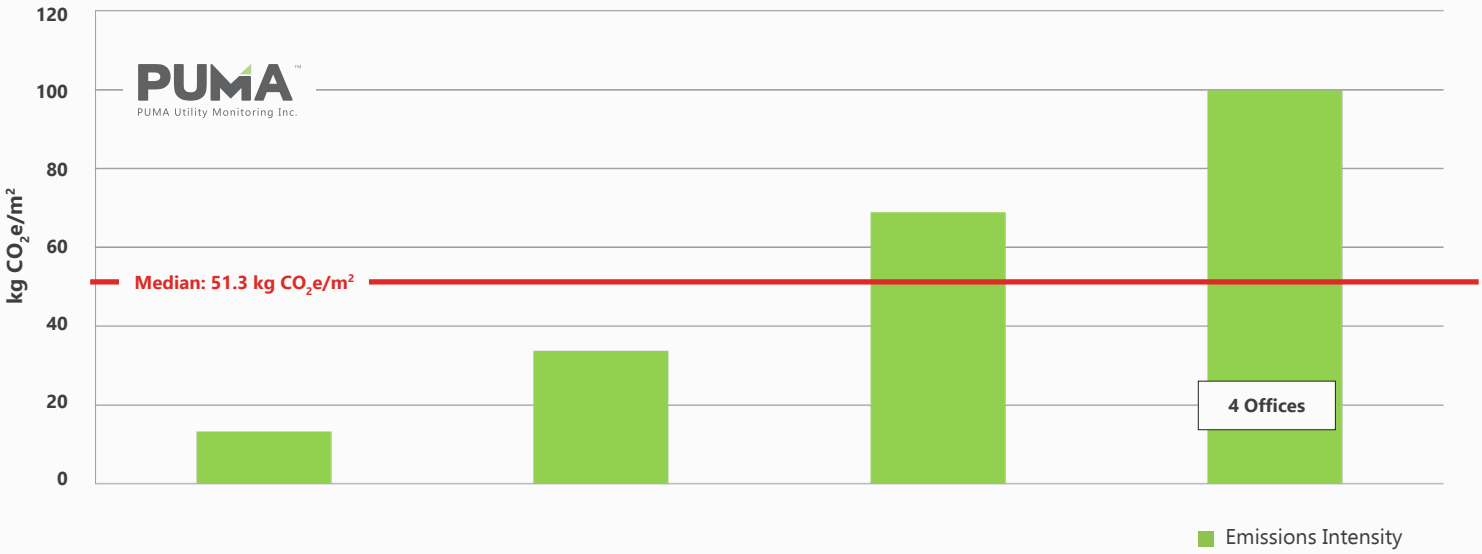
COASTAL BC BOARD OFFICES GHGi Calendar Year 2022



INTERIOR BC BOARD OFFICES EUI Calendar Year 2022



INTERIOR BC BOARD OFFICES GHGi Calendar Year 2022



2022 Median Energy Use Intensity Summary

COASTAL BC			
School District Building Type	**Median Energy Use Intensity (EUI)**	**Median Emissions Intensity (GHGi)**	**Sample Size**
Elementary	152 kWh/m²	19.9 kg CO_2e/m²	317 buildings
Secondary	159 kWh/m²	19.0 kg CO_2e/m²	77 buildings
Board Offices	199 kWh/m²	18.1 kg CO_2e/m²	11 buildings
Overall District Average	**170 kWh/m²**	**19 kg CO_2e/m²**	11 districts

INTERIOR BC			
School District Building Type	**Median Energy Use Intensity (EUI)**	**Median Emissions Intensity (GHGi)**	**Sample Size**
Elementary	198 kWh/m²	26.5 kg CO_2e/m²	36 buildings
Secondary	211 kWh/m²	27.1 kg CO_2e/m²	15 buildings
Board Offices	349 kWh/m²	51.3 kg CO_2e/m²	4 buildings
Overall District Average	**253 kWh/m²**	**35 kg CO_2e/m²**	4 districts

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.

PUMA™

PUMA Utility Monitoring Inc.

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.

www.pumautilitymonitoring.ca

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