## Zebx DecarbLunch Series Powered by Zeic

## Vancouver's GHG Reporting Bylaw – Reflections & Projections

Thu Apr 3, 2025 12 - 1pm PDT Free Webinar zebx.org









Natural Resources Ressources naturelles Canada Canada

Canada





#### Support Programs Include:

Commercial Buildings	Non-Profit Housing	Market Rental	Residential Strata
BOMA BRITISH COLUMBIA	BC Non-Profit Housing Association	LANDLORDBC	Strata Energy Advisor Better buildings start here Powered by Zeic
	Aboriginal Housing Management Association		CHOA Condominium Home Owners Association of BC
Decarb Accelerator	Member Supports	Rental Apartment Retrofit Accelerator (RARA)	Strata Energy Advisors

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# Decarb Accelerator Initiative

Participant buildings receive hands-on support for identifying and implementing decarbonization retrofits, as well as targeted training for the building team.

# Annual GHG and Energy Limits By-law-Reflections and Projections



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April 03, 2025

# **1. Policy Development**



## Vancouver's Climate Commitments -Buildings





## **Vancouver's Carbon Pollution**

## 57% natural gas use in buildings

## 37% gas and diesel in vehicles

3% electricity + NEU

4% waste City of Vancouver 2020 emissions inventory (GPC, Scopes 1 and 2)

Due to rounding, numbers presented may not add up to exactly 100%

#### **ANNUAL CARBON POLUTION, BUILDINGS AND ENERGY SOURCE**



# 95% of building emissions are from fossil gas



#### WHY DECARBONIZE THROUGH ELECTRIFICATION? Resilience Co-Benefits

+Heat pumps provide heating & *cooling* 

+Protect vulnerable residents from extreme temperatures and overheating



+Huge economic opportunity: skilled jobs and a sustainable local economy

- New construction: \$3B + 1,700 jobs (by 2032)
- Retrofits: \$8B + 4,000 jobs (by 2040)



## Annual Greenhouse Gas and Energy Limits Bylaw

## **GHG** Limits

2022 COUNCIL APPROVAL

#### 2026 GHGI LIMITS

Office + Retail >100k ft<sup>2</sup>

## 2040 GHGI + HEI LIMITS

Office + Retail >100k ft<sup>2</sup>

#### Reporting

2024 Commercial >100k ft<sup>2</sup> 2025 Commercial >50k ft<sup>2</sup> Multifamily >100k ft<sup>2</sup> 2026 Multifamily >50k ft<sup>2</sup>

## Annual Energy & Carbon Reporting (Benchmarking)

- 1. Measure energy/carbon consumption
- 2. Compare with:
  - historical performance
  - similar buildings
  - reference standards
- 3. Identify areas for improvement





## Why Require Energy & Carbon Reporting (Benchmarking)?

### It leads to:

- My building emits how much GHGs?!
- We spend that much on energy?!
- Better planning for replacement projects

# "You can't manage what you don't measure"





## Benchmarking Example: Energy Use in Multifamily Buildings



Distribution of annual energy consumption in a typical MURB. Units shown in kWh/m²/yr and as percentage of total consumption.

#### Builder Insight No. 12 - Energy Use in Mid to High-Rise

- \$1,200/year cost per suite
- 39% paid by occupant
- 61% paid by the building



### **Benchmarking in North America**





Policies that require **existing buildings** to meet specific **performance targets**, over time, with progressively stricter targets

## GHG Intensity (GHGI)

- Kg CO<sub>2</sub>e/m<sup>2</sup>/year
- Natural gas (fossil & renewable) + district energy X GHG emission factors / gross floor area

#### Heat Energy Intensity (HEI)

GJ/m2/year

• Natural gas (fossil & renewable) + district energy / gross floor area



### Rationale for Building Performance Standards

- 1. Provides owners with clarity and flexibility
- 2. Focuses on where there's already capacity
- 3. Responds to growing demand
- 4. Allows industry time to respond
- 5. Aligns with best practice





Follows Building Performance Standards **BEST PRACTICE**: NYC, Washington D.C., Boston, Washington State, Denver.

**COORDINATION** with regional government direction + complements planned Provincial regulations.

**TOP-DOWN** (achieve City targets) **BOTTOM-UP** (reflective of local buildings)





## **Building Stock Characterization**





Clusters based on multiple parameters - better

suited to capture variations in building performance

Typical approach

Clusters based on program type only – limited number of definitions with little variation

use and emissions.

#### Multi-Parameter Clustering of the Building Stock

We used a clustering method based to analyze the city's building stock (shown here as in comparison with a more conventional approach)







#### We calibrated energy models matched with cost models across all upgrade packages to generate first cost and lifetime cost estimates, and GHG emissions

**2019-20**: deep retrofit workshops and engagement with interest holders

**2021-22**: External Advisory Committee

**2022**: Broad industry engagement prior to Council approval

**2023 - Present**: Technical Advisory Committee + Climate Friendly Buildings Advisory Committee



## Engagement Process: 2021-2022

- 1. Collaborative engagement/learning-journey developed with BOMA BC and External Advisory Committee
  - External Advisory Committee (BOMA BC, key owners, retrofit engineering firms, mechanical contractor association, district energy utilities) + gov observers
  - Principles, archetype retrofit bundles, deep retrofit plan results, real data and case studies
  - Time + multiple info sources/formats + responsiveness + transparency = understanding, confidence, trust and support
- 2. Traditional open engagement (publish draft regs, open workshops, etc)







## Rationale for the Specific Limits in the Bylaw

# 2026 GHGI Limits

#### LIMITS FOR OFFICE + RETAIL >100,000 FT<sup>2</sup>

Office 25 kg  $CO_2/m^2/year$ Retail 14 kg  $CO_2/m^2/year$ 

#### RATIONALE

- Impacts worst performing 25%
- No capital improvements (for most)
- Compliance is flexible
- Price signal to act



\*Modelled percentage. Actual is 16% based on 2023 reporting data.

# 2040 GHGI + HEI Limits

#### LIMITS FOR OFFICE + RETAIL >100,000 FT<sup>2</sup>

GHG Limit Heat Energy Limit 0 kg CO<sub>2</sub>/m<sup>2</sup>/year 0.09 GJ/m<sup>2</sup>/year (25 kWh/m<sup>2</sup>/yr)

#### RATIONALE

- 100% renewable energy
- 85% reduction in heat energy
- Renewable gas for peaking/back-up
- Regulatory clarity → Retrofits aligned with capital replacements



# **2040 Limits Impact**

• Multiple pathways to achieve GHG savings of 60-90% with a neutral lifecycle cost.

 Buildings are achieving these reductions today: www.zebx.org/resources/



# 2. Implementation



## **Energy & Carbon Reporting (ECR) Timeline**





## Getting ready for implementation (2022-2023)

- By-law drafting and enactment
- Resource requirement
  - FTE
  - Software
  - Utility support
- Communication planning





### **Compliance Process**

# 1.

#### ENERGY STAR<sup>®</sup> Portfolio Manager<sup>®</sup> (ESPM)

Upload property details and energy use here for each building



**ENERGY STAR®** 

#### Building Performance Reporting System (BPRS)

Collects additional required and optional information that cannot be reported in ESPM.

Also view data snapshots and apply for external forms such as extensions and exemptions here.

#### WANCOUVER.CA

Vancouver annual GHG limits by-law reporting

Vancouver Build Reporting Syste	ding Performance em
Submit energy data and form	าร
Email address	
user.name@example.com	
Password *	
Forgot your password? Log in	
Need an account?	
Register for an account	



# 3. Year 1 Results



### **Compliance Rate - Reporting 2024**



### Challenges

- Utility data access
- Connection issues with BPRS
- Metering questions
- Reporting restaurant energy use
- Reporting for Stratas





### 2026 Outlook- Office >=100k sqft – GHGI Distribution

2023 GHGI Data (2024 Reporting Year) Office\* buildings with 2026 limits (n=117)



connected to Creative Energy

\*includes office primary (n=95) + office-dominant mixed-use buildings (n=22)



### Retail >=100k sqft – GHGI Distribution



\*includes primary retail (n=10) and retail-dominant mixed-use buildings (n=2)



## Outlook on 2026 GHGI Limit Compliance



### Office >=100k sqft – HEI Distribution

#### 2023 HEI Data (2024 Reporting Year) Office buildings with 2040 HEI limits (n=117)



\*includes office primary (n=95) + office-dominant mixed-use buildings (n=22)



### Retail >=100k sqft – HEI Distribution



\*includes primary retail (n=10) and retail-dominant mixed-use buildings (n=2)



# **Energize Vancouver Map**



- Compliance status of buildings
- Key performance metrics for disclosed buildings
- Anonymized and non anonymized data export
- <u>Map</u>



## **Building Performance Scorecards**

VANCO	ENERGIZE ENERGIZE	ergy ai	nd Cai	rbon Repor	ting	Scoreca Decemi	ard 2023 Der 4, 2024	
		Tim Jan De	eframe c. 2023	Building ID	Squa	re Footage	Year Built	
	GHGI and HEI Limits Table			GHGI: 10.3 kg CO2e/m2/y	r	Heat Energ	y Intensity: 21	
	GHGs in Excess Limits (tons kgCO2)	0	Norm hardeling store is setting		acth	GJ/m2/yr		
2026 Limit	Projected GHG over emission permit fee (\$)	\$0	• Yo in in	terms of GHGI and terms of HEI out of	46 <sup>th</sup> 56 <sup>th</sup> f 119	EMISSIONS COMPLIANCE STATUS Year of Emissons		
	Carbon Emissions Operating Permit fee (\$)	\$500	bu • Fo wi	i <b>ldings</b> r further compliand th the 2026 GHG	ce	Complian (GHGI Lim CO2e	<b>nce: 2026</b> nit = 25 kg e/m2)	
	GHGs in Excess Limits (tons kgCO2)	96	Lir	Limit/2040 GHG and HEI		ON TRACK Year of Emissons Compliance: 2040		
	Heat Energy in Excess of Limit	1,079	limit, conduct an energy audit and take advantage of utility programs for		rgy			
2040 Limit	Projected GHG & HEl over emission permit fee limits (\$)	\$XX,XXX			tage r			
	Carbon Emissions Operating Permit fee (\$)	\$500	en gre	energy efficient and greener buildings		(GHGI Limit = 0 KgCo2/n & HEI = 0.9 GJ/m2)		

#### REDUCTION PLAN REQUIRED



#### **Resources and Recommended Actions**

Energy-efficient and greener buildings provide financial savings, stand out in the market, and add resilience. Here are the recommended programs for your building.

#### Identify inefficiencies in your building

<u>BC Hydro Integrated Energy Audit</u>: offers up to 100% funding for an energy audit.

<u>CleanBC Feasibility Funding</u>: Custom Program supports up to 50% of an energy study's cost, up to a maximum of \$20,000.

#### **Reduce GHGI and operational costs**

#### Quick actions to meet 2026 limits

Incentives for GHGI reductions up to 20%

- <u>Continuous Optimization Program</u>: offers no-cost recommissioning consultations to large, commercial buildings
- <u>HVAC Controls for Commercial and Industrial</u>: offers rebates on connected thermostats, domestic hot water recirculation controls, hydronic additives
- <u>Pipe and Tank Insulation</u>: offers rebate of \$4 \$9 per square foot for pipe and tank insulation
- <u>Air Curtain Rebates</u>: offers up to \$2,000 per door for installing a qualified air curtain

Long term actions to meet 2040 limits Incentives for GHGI reductions up to 60%

- <u>Dual Fuel Rooftop Units</u>: offers up to \$150,000 per installation or building
- <u>Custom Efficiency Program</u>: offers up to \$500,000 to fund natural gas efficiency upgrades in commercial buildings

Sign up for FortisBC voluntary <u>Renewable</u> <u>Natural Gas</u> blend to lower your GHGI!

#### **Reduce electrical load and operational costs**

<u>BC Hydro Lighting Systems Incentives</u>: offers average incentive of 25% of a lighting project's cost <u>BC Hydro Custom Project Incentives:</u> offers funding for the implementation of energy management opportunities

#### **BC & Federal Tax Credit Programs**

<u>Clean Buildings Tax Credit</u> <u>Clean Technology Investment Tax</u>

For more information contact utilities: FortisBC:

BC Hydro:



#### City of Vancouver Annual Greenhouse Gas and Energy Limits Bylaw:

Office and retail buildings in Vancouver with gross floor area greater than or equal to 9,290 m<sup>2</sup> (100,000 ft<sup>2</sup>) will be subject to Greenhouse Gas Intensity (GHGI) limits starting in 2026 and Heat Energy Intensity (HEI) limits starting in 2040. These limits focus on reducing emissions from space and hot water heating and transitioning to low-carbon and renewable energy sources. Compliance can be achieved through energy efficiency measures and/or using low-carbon energy like electricity and renewable natural gas.

#### Definitions & Terminology Used in the Scorecard:

- 2026 GHGI (Greenhouse Gas Intensity) Limit
  The 2026 GHGI limit is set at 25 kg CO2e/m<sup>2</sup>/year for
  commercial office buildings and 14 kg CO2e/m<sup>2</sup>/year
  for retail buildings.
- 2040 GHGI (Greenhouse Gas Intensity) Limit The 2040 GHGI limit is 0 kg CO2e/m<sup>2</sup>/year for both commercial office and retail buildings.
- 2040 HEI (Heat Energy Intensity) Limit The 2040 HEI limit is 0.09 GJ/m<sup>2</sup>/year for both commercial office and retail buildings.

- Carbon Emissions Operating Permit fee (\$)
  The fee is applicable annually to all buildings covered under GHGI and HEI limits and is set at a flat rate of \$500 per year.
- Projected GHG over emission permit fee 2026 (\$) The over emissions fee applies to buildings that exceed their specified GHGI limit. This fee is calculated at a rate of \$350 per tonne of CO2e that surpasses above the allowed annual limit.

#### Projected GHG & HEI over emission permit fee 2040 limits (\$)

The over emissions fee applies to buildings that exceed the specified GHGI and HEI limits in 2040. This fee is calculated at a rate of \$350 per tonne of CO2e and \$100 per gigajoule (GJ) for buildings that exceed the annual GHGI and HEI limits, respectively.

# 3. Support Programs



## **Support Programs**

#### <u>Utilities</u>

- Continuous Optimization Program BC Hydro/FortisBC
- Battery Storage + Solar Incentives BC Hydro
- Studies & Custom Incentives FortisBC
- Hybrid HP RTUs FortisBC

#### BOMA BC

Decarb Accelerator

#### Tax Credits

• Federal 30% Clean Technology Investment Tax Credit

#### Vancouver + BOMA (Coming in 2025)

- Decarbonization Planning Tool
- Commercial Building Network





### **Energize Vancouver**

- One stop shop for existing commercial and multi-family buildings
- Regulation details
- Compliance steps
- Building lookup tool
- Resources and support available





## 4. 2025 Outlook



## **Upcoming activities**

- Reporting for comm. >=50,000 ft sq
- Reporting for multi-family >= 100,000 ft sq
- Continued reporting for comm. buildings >=100,000 ft sq
- Update adjustments for restaurant and residential use
- Supporting guides for buildings under GHGI limits
- Monthly webinar series in 2025





Stay up-to-date with Energize Vancouver mailing list at <a href="http://vancouver.ca/energize-vancouver">http://vancouver.ca/energize-vancouver</a>

ECR Help Centre: <a href="mailto:energycarbonreport@vancouver.ca">energycarbonreport@vancouver.ca</a> (604) 330-3797









## www.BCRetrofitAccelerator.ca

Commercial Buildings	Non-Profit Housing	Market Rental	Residential Strata	
BOMA BRITISH COLUMBIA	BCNOPHA BC Non-Profit Housing Association	LANDLORDBC	Strata Energy Advisor Better buildings start here Powered by Zeic	
	Management Association		Condominium Home Owners Association of BC	
Decarb Accelerator	Member Supports	Rental Apartment Retrofit Accelerator (RARA)	Strata Energy Advisors	

## BOMA BC's Decarb Accelerator Program is now accepting buildings for 2025

Designed specifically for the office and retail sector, participating properties receive hands-on assistance developing a decarbonization plan for their property, identifying systems retrofits, training for their operations team, plus other support resources.

To learn more about the program, or view the application, scan the QR Code

