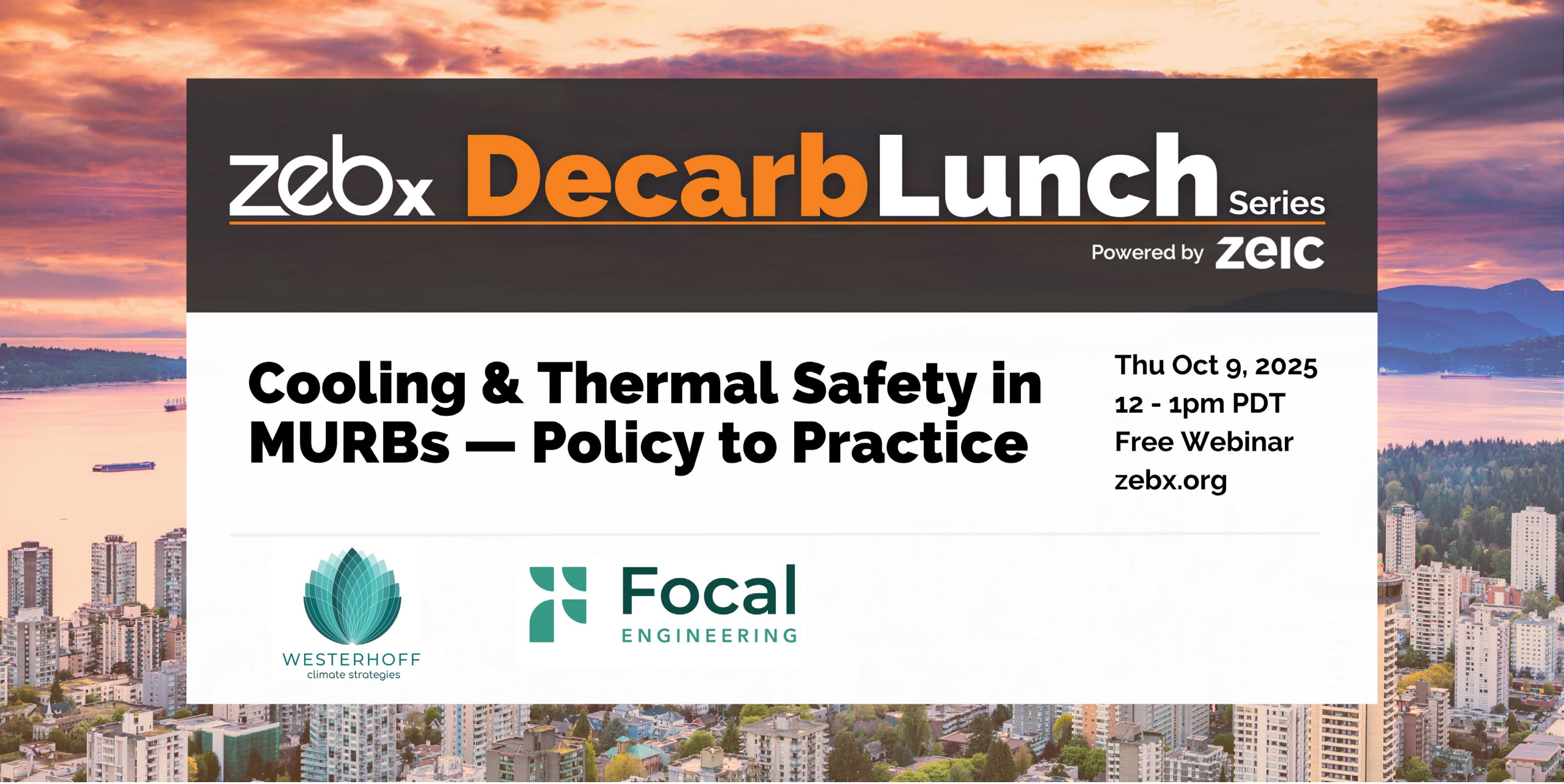

zebx DecarbLunch Series

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Cooling & Thermal Safety in MURBs — Policy to Practice

Thu Oct 9, 2025
12 - 1pm PDT
Free Webinar
zebx.org

WESTERHOFF climate strategies

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CITY OF VANCOUVER

Natural Resources Canada / Ressources naturelles Canada / Canada

BC Hydro

Thermal Safety in Existing MURB

Report and Recommendations

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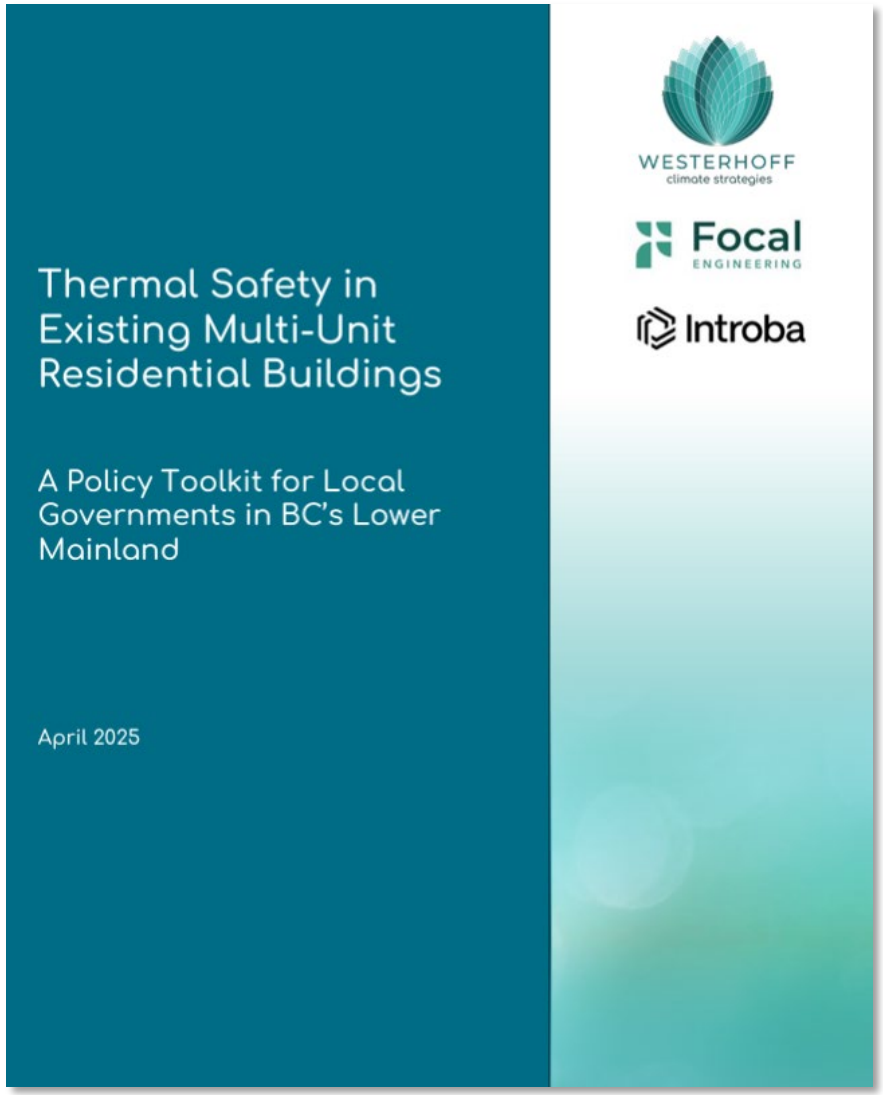
Introba

Overview

1. Overview of the background and purpose of the report
2. Defining and assessing thermal safety in existing MURB
3. High priority recommendations
4. Discussion



BACKGROUND

Why did we write this report?

Another Hot One

British Columbia

Early-season heat grips B.C.'s South Coast, raising health concerns

Temperatures could reach low 30s inland; experts urge residents to check on vulnerable people and pets

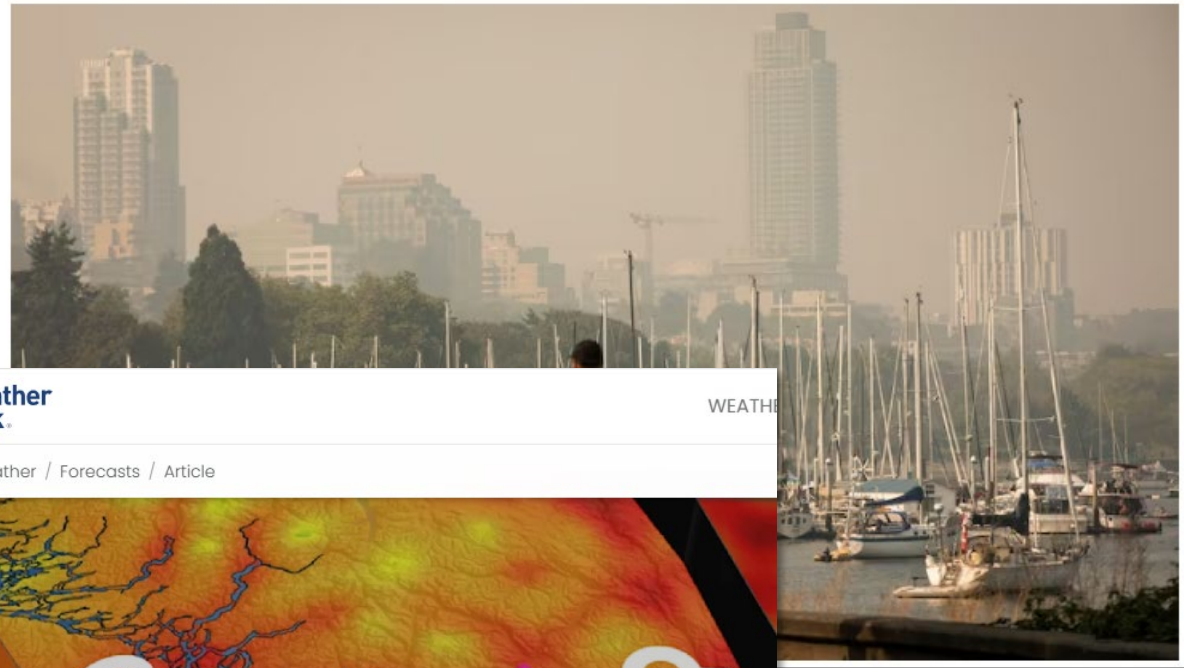
CBC News · Posted: Jun 07, 2025 6:17 PM PDT | Last Updated: June 7

British Columbia

Air quality warnings spread across B.C. as wildfire smoke lingers, heat records topple

People in Metro Vancouver, Fraser Valley, Interior and northeast B.C. urged to limit time outdoors

CBC News · Posted: Sep 03, 2025 12:34 PM PDT | Last Updated: September 3



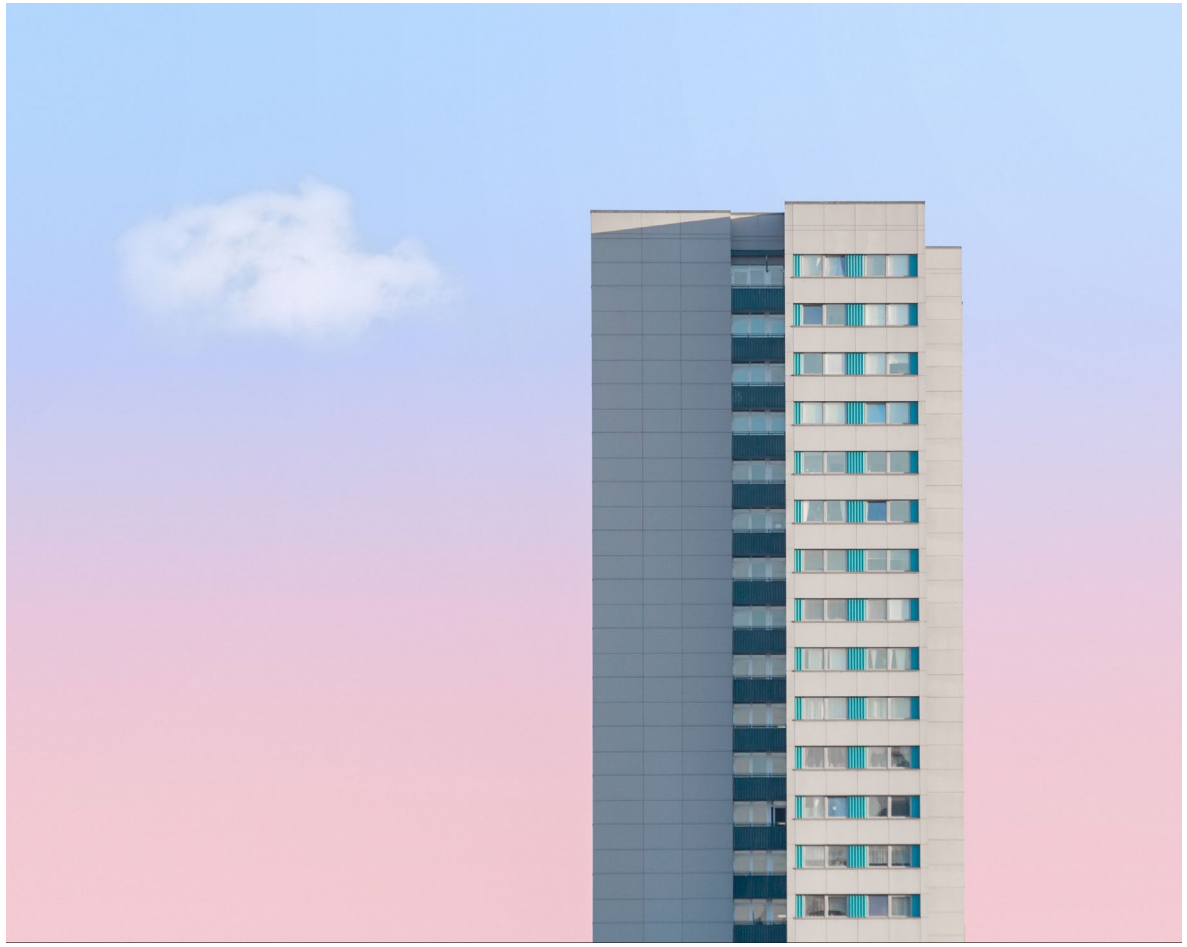
The Weather Network

WEATHE

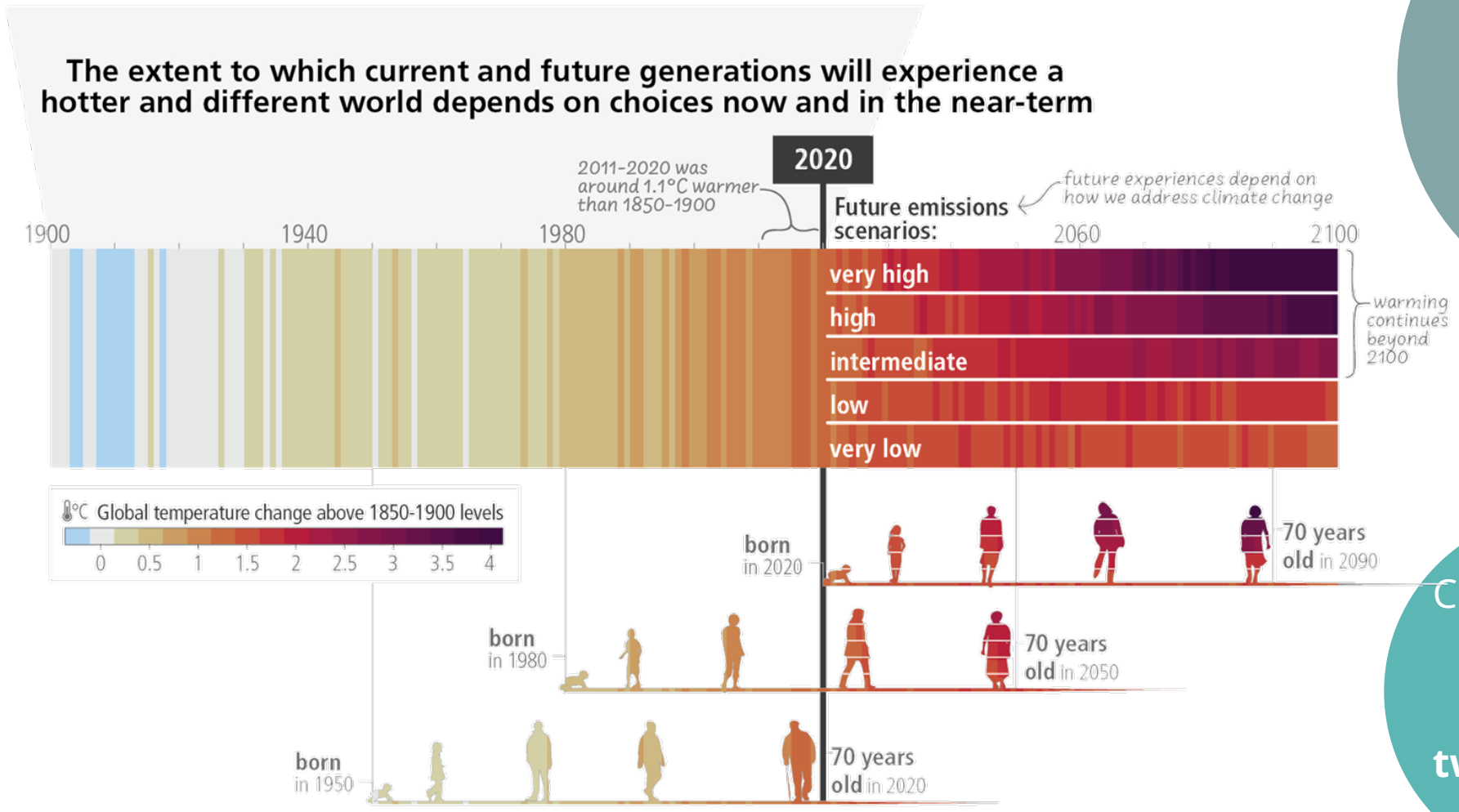
/ News / Weather / Forecasts / Article

The Impacts of Extreme Heat

- **High summer temperatures and extreme heat events are negatively impacting many people living in multi-family buildings**
- The elderly, people experiencing social isolation, people with pre-existing health conditions, and others are all more likely to experience adverse health effects.
- This is especially the case when temperatures remain over 26°C for prolonged periods of time.



Extreme Heat in the Future



Source: UN IPCC SPM.1 in the AR6 Synthesis Report

Year-round temperatures are expected to **increase by ~5°C** by the 2080s

Nights are expected to stay **above 18°C** more frequently, making it harder for buildings and people to cool down

Cooling degree days are expected to increase **twelve-fold** by the 2080s

Project Purpose

Outline a suite of actions that local and regional authorities (and industry partners!) can take, in the short to medium term (i.e. between now and 2030), to help safeguard the thermal safety of MURB occupants in the Lower Mainland

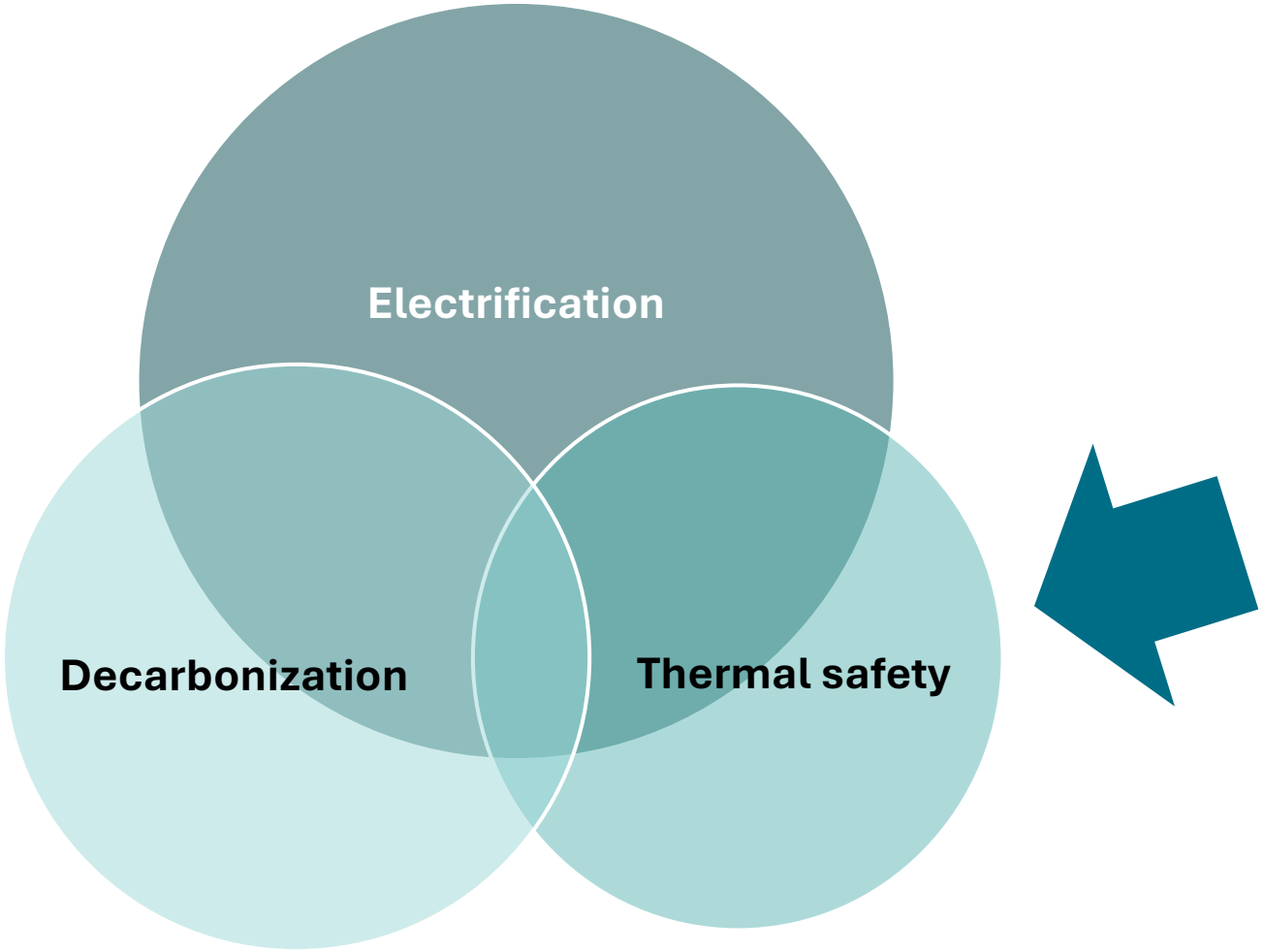
city of north vancouver

Vancouver Coastal Health

metro vancouver

CITY OF VANCOUVER

Multiple Priorities



Also considered:

- ❑ Air quality
- ❑ Equity and affordability
- ❑ Grid citizenship
- ❑ Local government authority
- ❑ Actions at other scales
- ❑ …

Building on the Existing Landscape

2024 BC Building Code Update

Introduced a maximum design temperature limit (26°C) for a single living space in each dwelling unit.

BC Hydro Free Portable Air Conditioners

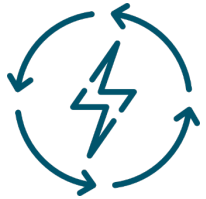
Provides free, publicly funded portable air conditioners for people with recommendation letters

BC Hydro multi-unit residential building offers

Provide rebates and support for upgrades that improve efficiency and reduce emissions.

Zero Carbon Step Code

Outlines a set of increasingly stringent targets for reducing new buildings' greenhouse gas emissions intensity



Highest Efficiency Equipment Standard

Outlines a pathway towards large-scale building electrification by 2030

BC Building Electrification Roadmap

Would require all new space and water heating equipment be at least 100% efficient

Recommended Actions

Awareness and Capacity

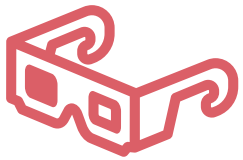
Actions to address low owner and tenant understanding of needs and options

Policy and Legislation

Actions to address limited opportunities for tenant influence, challenging decision-making structures and address low-uptake of thermal safety retrofits, including code and structural barriers

Funding and Finance

Actions to address impacts on capital and operating costs, including for tenants



Industry and Technology

Actions to address low industry expertise and availability, and improve market availability of key products

SUPPORTING THERMAL SAFETY

Practical approaches for integrating cooling into existing buildings

Defining Thermal Safety

Thermal comfort

A condition in which building occupants generally feel satisfied with the indoor temperature, humidity, and airflow, and is achieved by balancing environmental and personal factors to create a pleasant indoor environment conducive to a range of activities, from working to sleeping.

Thermal safety

A state in which indoor conditions are maintained within temperature thresholds that prevent adverse health effects under prolonged exposure, protecting occupants' health even if the environment isn't comfortable.

26°C dry bulb

Which retrofit technologies are the most effective at achieving thermal safety in an existing MURB?

Thermal Safety Measure Categories

Active cooling measures that remove the heat and cool the space to achieve the desired indoor temperature using electric heat pumps.

Measures to reduce solar heat gains, minimizing heat gain from solar radiation by preventing or reflecting solar gains to reduce the demand for cooling.

Measures to improve airflow that promote air movement to dissipate heat when solar and/or internal gains (e.g. from cooking) are present.

Interim solutions, which represent active or passive measures that can temporarily or partially mitigate overheating risk or reduce cooling energy demand while longer-term solutions are being explored.

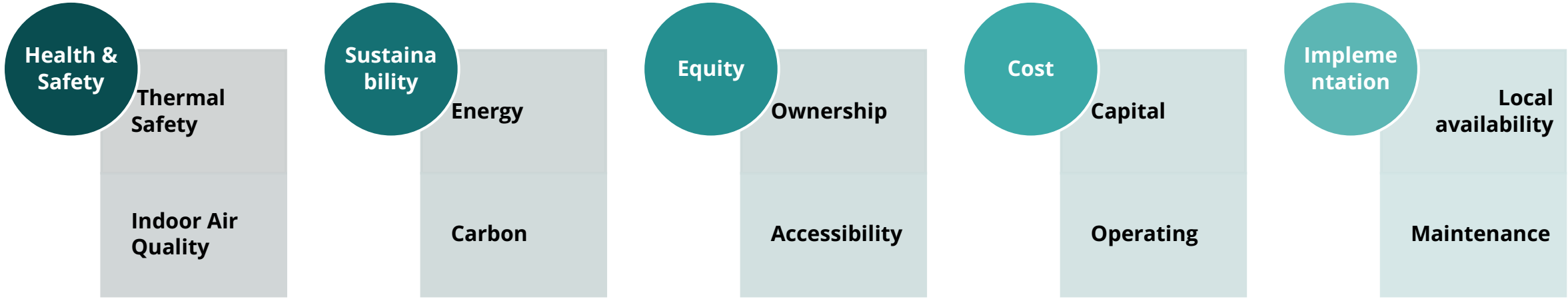
Co-benefit solutions, or measures that indirectly support indoor thermal safety but are targeted towards improvements in other areas of building performance.

Thermal Safety Measures

Thermal Safety Categories	Sample Measures	Effectiveness
Active Mechanical Cooling	Portable units, split systems, central systems	**High – Very High**
Reduce Solar Heat Gain	Exterior shading, window upgrades	**High**
Improve Airflow	Operable windows, exhaust fans, night ventilation	**Moderate- High**
Interim Solutions	Partial cooling, passive strategies with lower impact	**Low - Moderate**
Co-benefit Solutions	Improving envelope, reflective roof & green areas	**Low - Moderate**

Air Quality Categories	Sample Measures	Effectiveness
Mechanical equipment	Equipment filters (Carbon, MERV, HEPA)	**Very high**
In-space filtration	Portable air filters (e.g. HEPA)	**High**

Evaluating Measures



Because each building has unique existing conditions, individual assessment is required

Integrating cooling measures into retrofits

Ideal Pathway

Plan

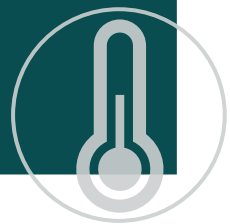
Passive
- Block solar gains
- Improve airflow
- Upgrade windows

Interim
- Load shed (add elec. capacity)
- Interim cooling

Mech Cooling
- Choose based on building needs
- Worst suites first

Ask the right questions

Identify the problem	What are building's constraints	Explore potential solutions
• How is the building overheating? • What is causing the overheating? • Who is being affected?	• Budget? • Ownership structure? • Other planned upgrades?	• Passive measures? • Active measures? • Electrical capacity study • Other/ interim measures?



Example: Kitsilano Low-Rise

- 4-storey, 8-unit, built in 1989
- Electric baseboards, gas fireplace, in-suite electric DHW
- No planned upgrades (envelope redone in 2006)
- Long & narrow units, no east/ west windows; top floors overheating
- Strata, limited budget

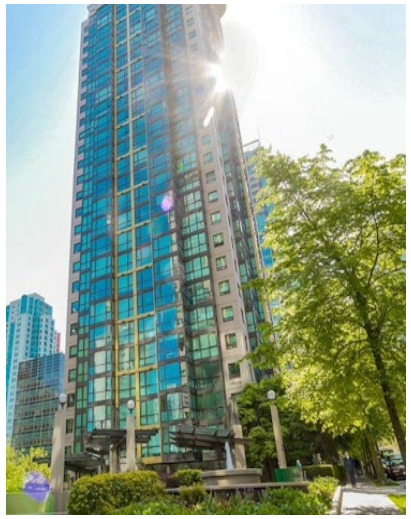
Plan
- Overheating isn't too extreme
- Budget for upgrades in 5-10 years

Passive
- Exterior shades ($24k) & exhaust fans
- Upper then lower floors (1-4 years)

Interim
- Load shed as possible (LEDs, appliances, explore DHW HP)

Mech Cooling
- Mini splits ($96k)
- Upper then lower floors (5-8 years)

Example: Coal Harbour High-Rise



- 25-storey, 175-unit, built in 1990s
- Central boiler for heating & DHW, hydronic baseboards
- No balconies, window wall, severe overheating, even smaller units that only face north
- Strata, varied occupants with many owners renting to tenants, limited budget

Plan

- Plan for major upgrades
- Ensure bylaws allow cooling
- Elec. capacity study

Interim

- Add MUA & amenity cooling
- Teach night cooling, load shedding & portable units

Mech Cooling

- Prioritize most severe areas
- Allow owners to add cooling if capable

Envelope

- Improve glazing, add opaque panels, ventilation, cooling ports, consider shading

A Policy Toolkit

For Local and Regional Governments in BC

Eight Priority Actions

Awareness and Capacity

Actions to address low owner and tenant understanding of needs and options

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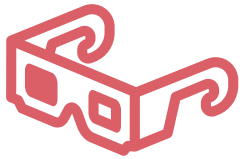


Industry and Technology

Actions to address low industry expertise and availability, and improve market availability of key products

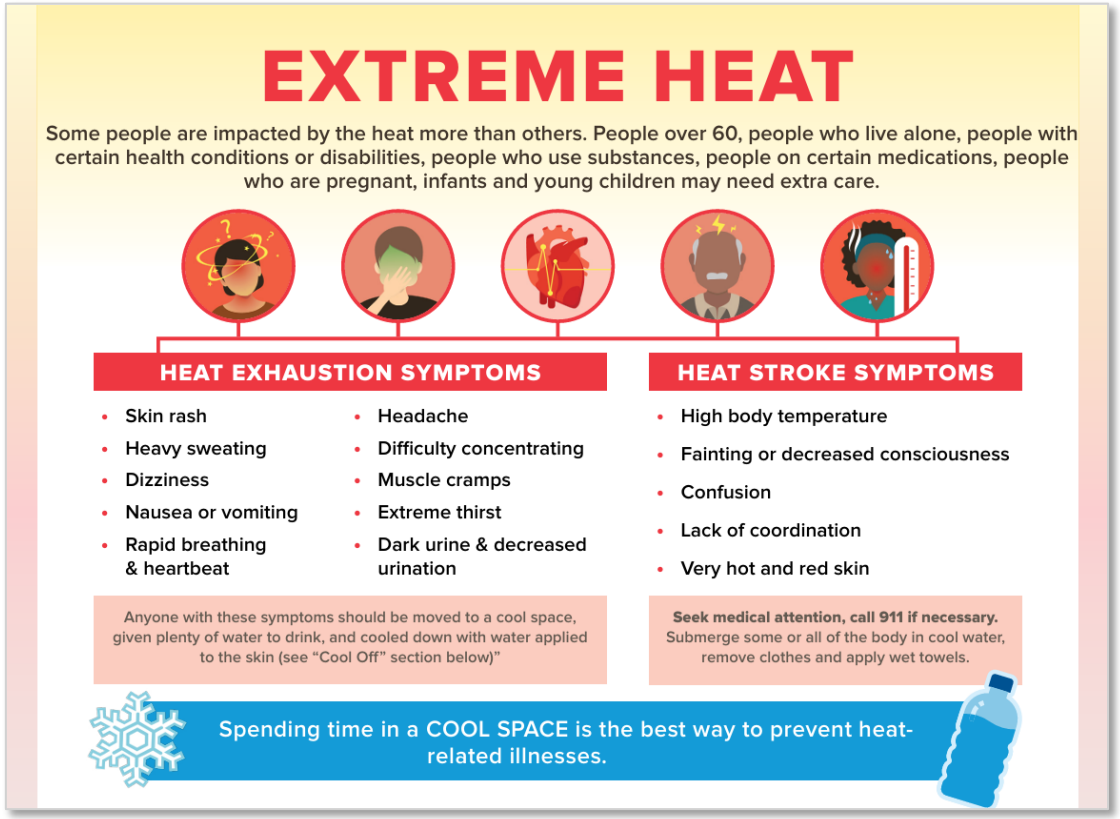
Education For Owners

- **Definition of thermal safety** and the thermal safety risks associated with high indoor temperatures
- **Current regulatory landscape** on thermal safety, including any incoming requirement(s)
- **Co-benefits and risks** of thermal safety upgrades
- **Temporary measures** to reduce risks of overheating during health emergencies
- **Types of upgrades**, including ranges of potential costs, guidance on proper installation, and technologies to avoid
- **How to plan** for upgrades to meet a building's cooling needs in the long term, and integrate cooling into other upgrades

Source: ZEIC

Education For Tenants

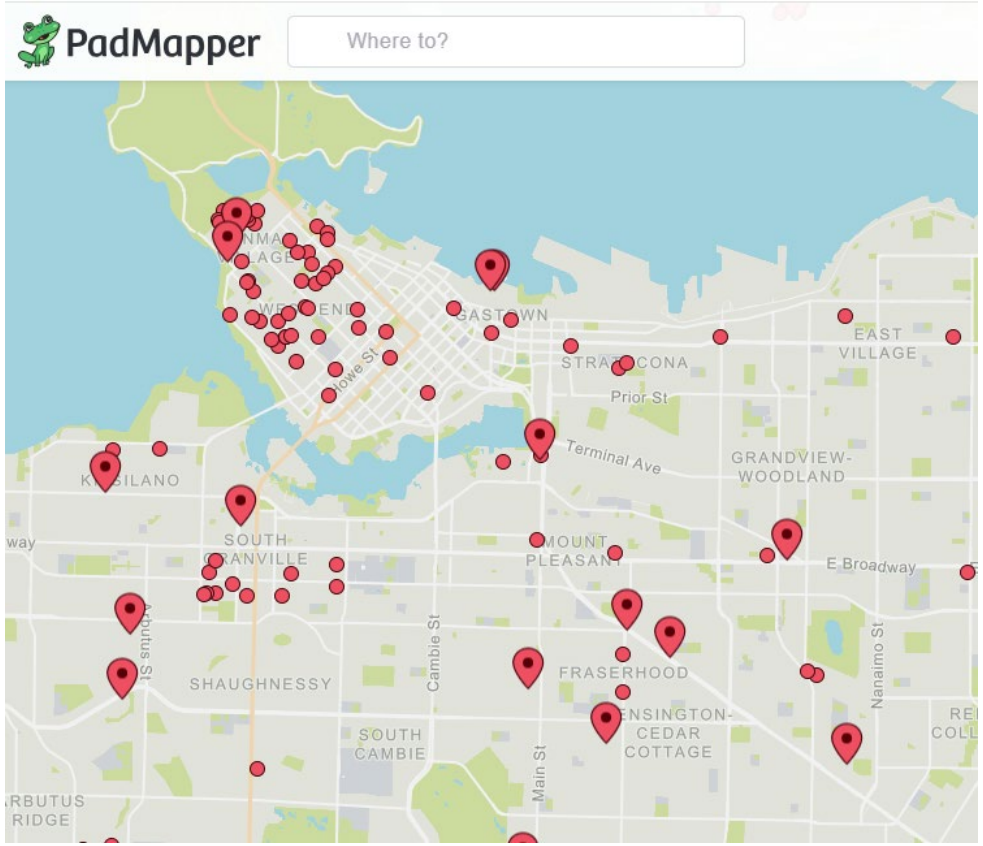
- **How to stay safe** under extreme heat, including cost-effective, low/no cost cooling and ventilation, as well as any appropriate temporary measures
- **Guidance on proper installation** of measures (e.g. window films), and what technologies to avoid
- **Clarity on roles and responsibilities** of landlords and rights of tenants
- **How to ask for and hold landlords accountable** for thermal safety measures



Source: Vancouver Coastal Health

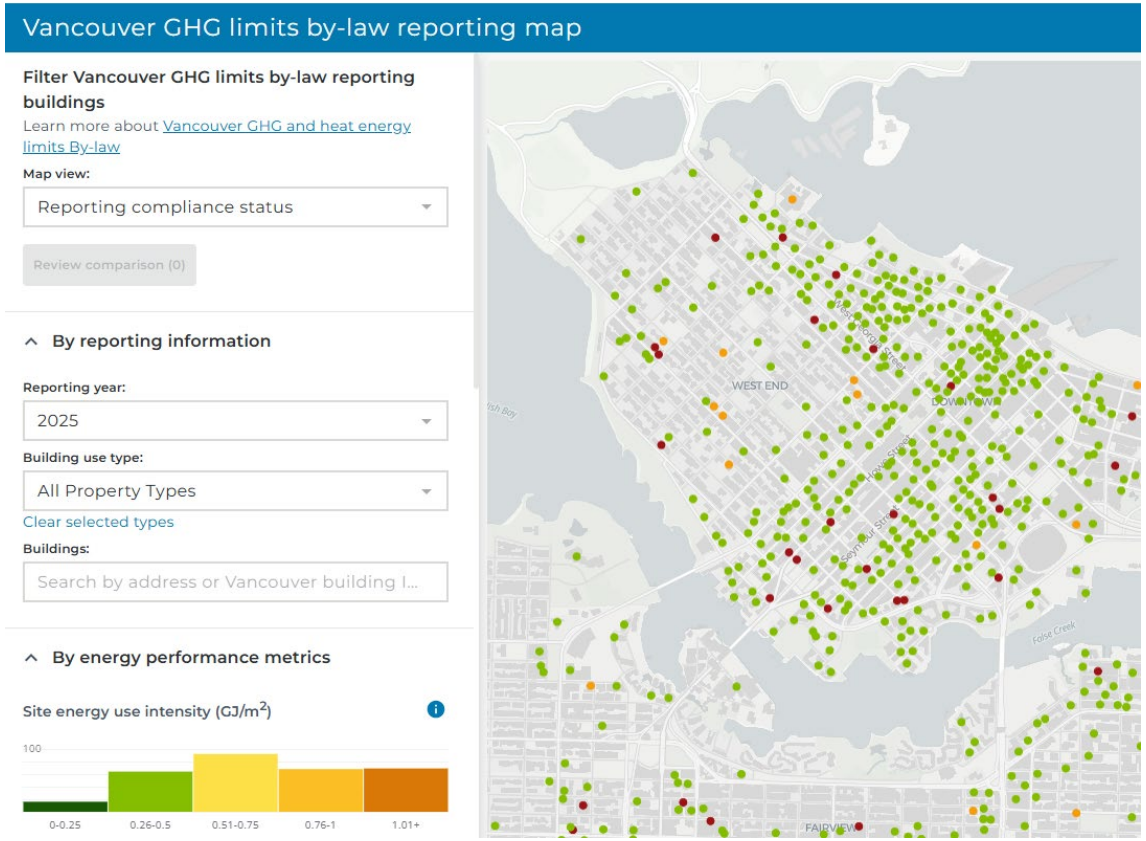
Getting the Word Out

Develop a means of signalling which rental buildings have active cooling systems to prospective tenants



Source: Padmapper

Require building owners to report and disclose existence of unit-level cooling



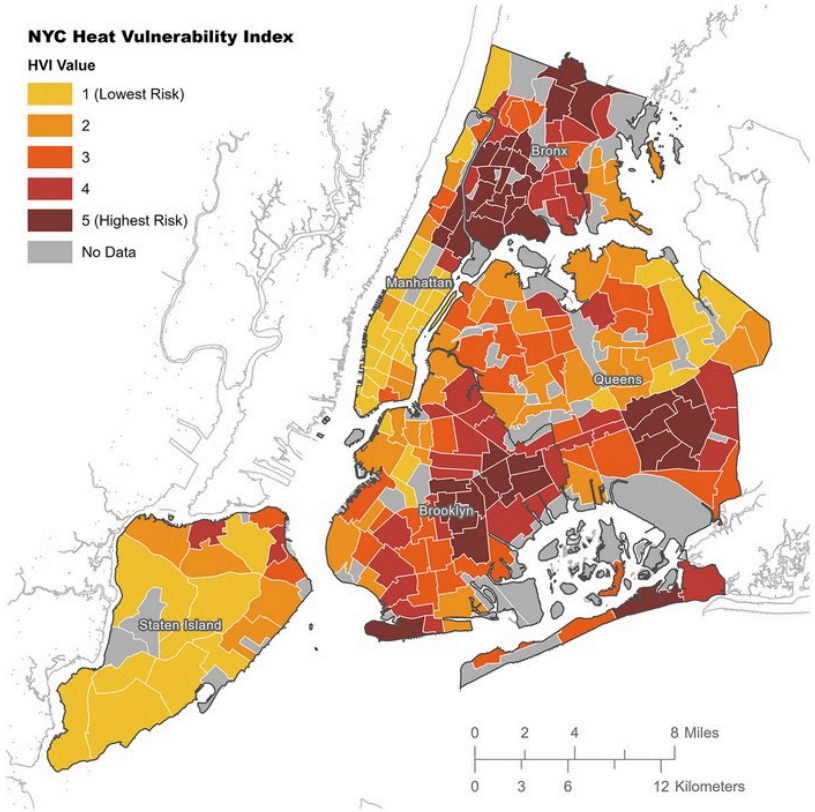
Source: Energize Vancouver

Figuring Out Where to Focus

Conduct or commission a set of studies designed to identify where cooling efforts should be directed

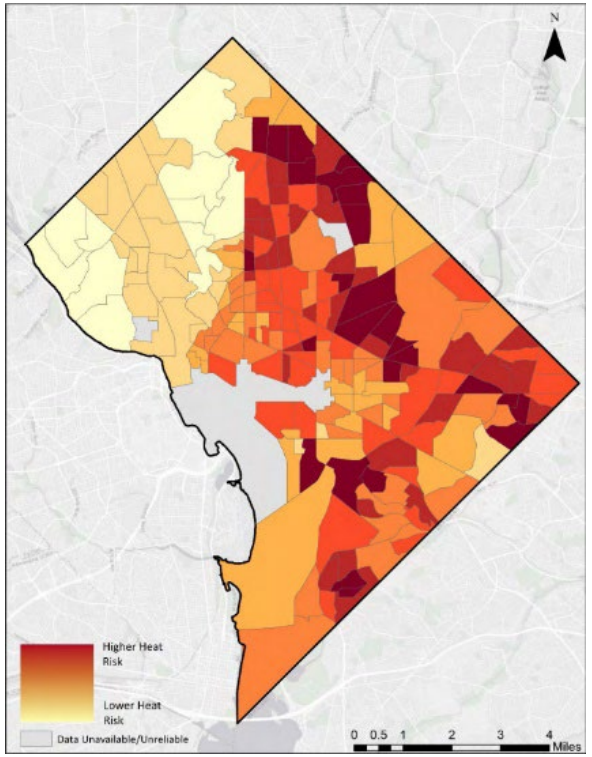
New York City

The interactive Heat Vulnerability Index map identifies neighbourhoods most at risk from extreme heat



Washington DC

The Heat Sensitivity Exposure Index highlights areas with high heat exposure and a concentration of heat-sensitive residents



A Range of Regulatory Options

Greater stringency/ impact

Lower stringency/ impact

- Require installation of active cooling
- **Establish a maximum indoor temperature limit**
- Require maintenance of existing air conditioning units or operable windows
- Require tenant access to cooling rooms
- **Remove policy barriers to cooling measures** (e.g. form and character, property standards bylaws, design covenants)

Things for local governments to consider:

- ❑ Legal authority
- ❑ Cost burden to owners/ tenants
- ❑ Equity and accessibility
- ❑ Intersection with other requirements

Jurisdictions who have adopted or are considering some form of maximum indoor temperature or cooling requirement:

Austin

City of Dallas

MONTGOMERY COUNTY

CITY OF PORTLAND, OREGON 1851

TORONTO

CA

Tempe

MISSISSAUGA

CHICAGO

City of Phoenix

COUNTY OF LOS ANGELES

KINGSTON

NYC

Finding the Money

Explore and leverage the financial tools within the municipal sphere of control to help support cooling retrofits

- Leverage, expand on and promote existing support programs
  - E.g. utility rebates, low-income assistance programs, financing options
- Explore:
  - New sources of funding tied to public health and safety
  - Support for cooling audits, electrical system/panel upgrades

Costs to consider:

- ❑ Upfront (including unexpected) costs to owners
- ❑ Downstream costs to tenants and risks to housing affordability
- ❑ Operating costs (including risks that active cooling won't be used)

Thank you!

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