



Existing + New Low-Rise Renovation & Construction



Image Courtesy Clay Construction

climate emergency 6 big moves

1

WALKABLE,
COMPLETE
NEIGHBOUR-
HOODS

Vancouver
Plan

2

ACTIVE
TRANSPORTATION
+ TRANSIT

Climate Emergency Action Plan (CEAP)

3

ZERO EMISSIONS
VEHICLES

4

ZERO EMISSIONS
SPACE + WATER
HEATING

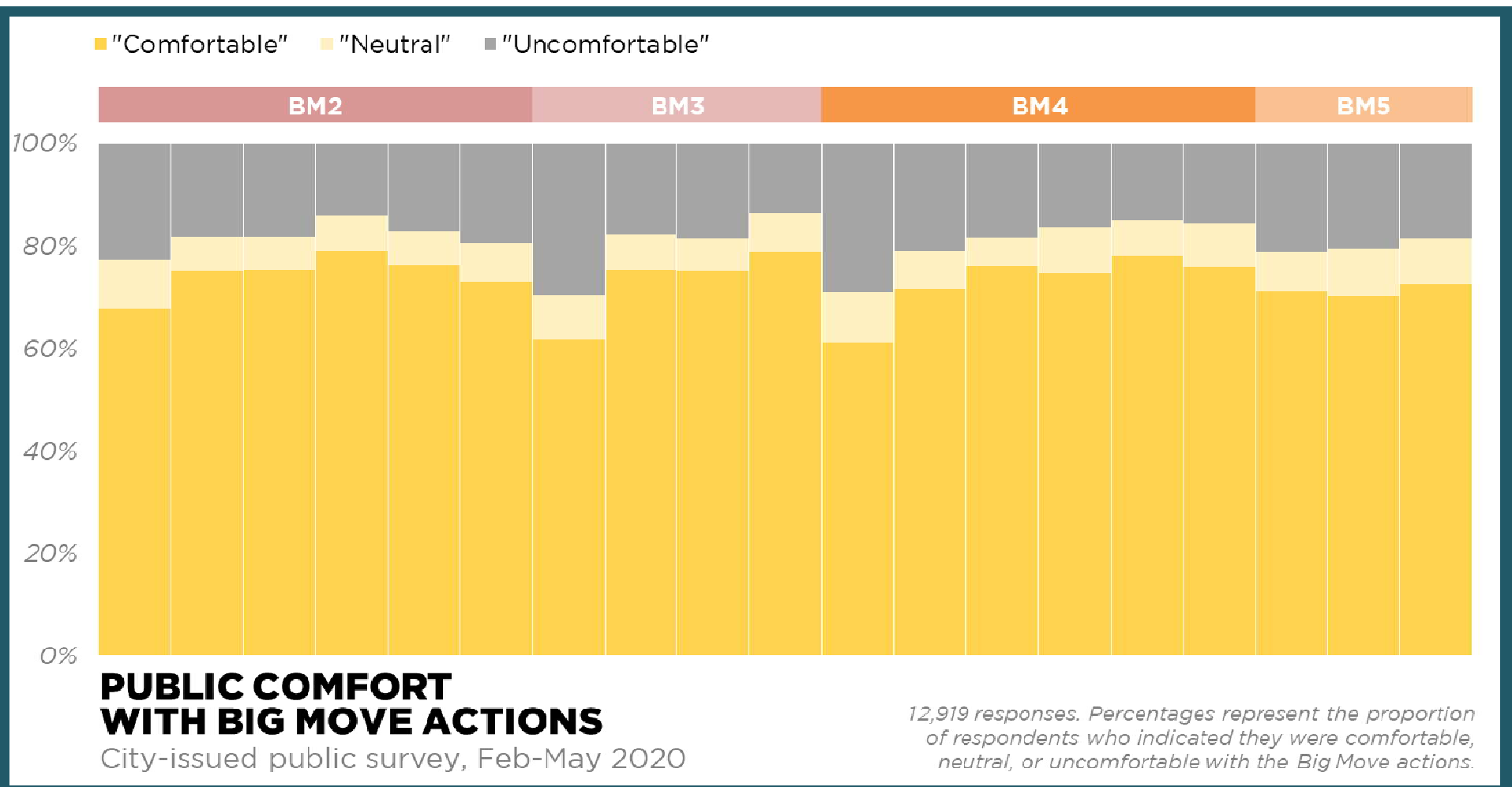
5

LOW CARBON
MATERIALS +
CONSTRUCTION
PRACTICES

6

RESTORED
COASTS +
FORESTS

reporting
In 2021



Climate Emergency

BIG MOVE

4



ZERO EMISSIONS SPACE AND WATER HEATING

By 2025, all new and replacement heating and hot water systems will be zero emissions.

the biggest emissions source
in Vancouver
is **burning natural gas**
for heat and hot water.

56% 

38%



then comes
burning gas and
diesel in
vehicles

56%



38%



and finally
electricity
and waste.

2%



4%



56%



~\$500M
REQUIRED SPEND
*over five years
to meet targets*

~\$270M **BASELINE SPEND**
*assumes maintenance
of 2020 funding*

REMAINING FUNDING GAP

3.0M tonnes CO₂e / year

2.5M - 2007

2.0M -

2020

No new policies

1.5M -

2025

CEAP (range)

CEAP + CleanBC (range)

2030 TARGET FOR 1.5°C

2030

1.0M -

0.5M -

VANCOUVER'S CARBON POLLUTION

Modelled scenarios

0.0M -



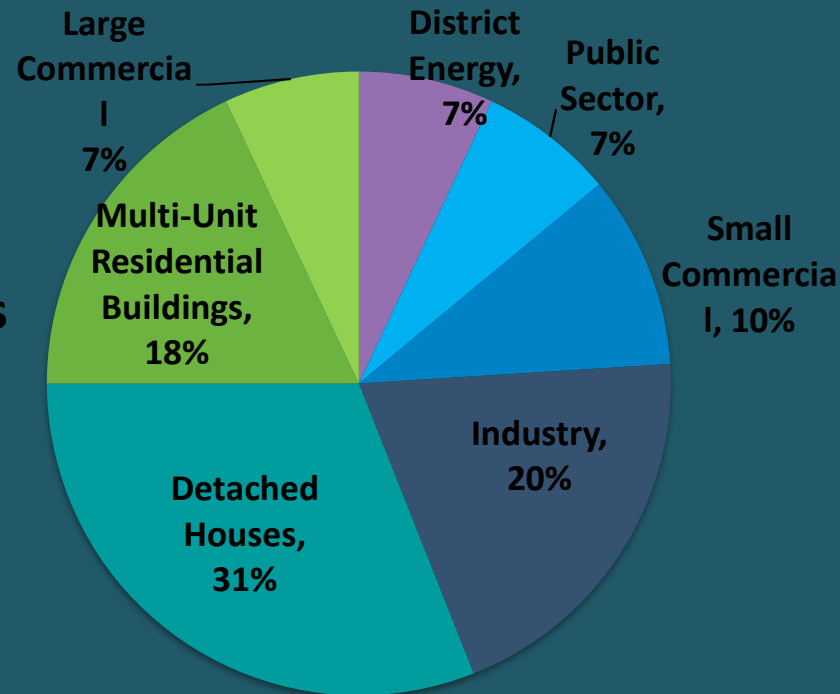
Existing Homes

GHG EMISSIONS FROM EXISTING BUILDINGS

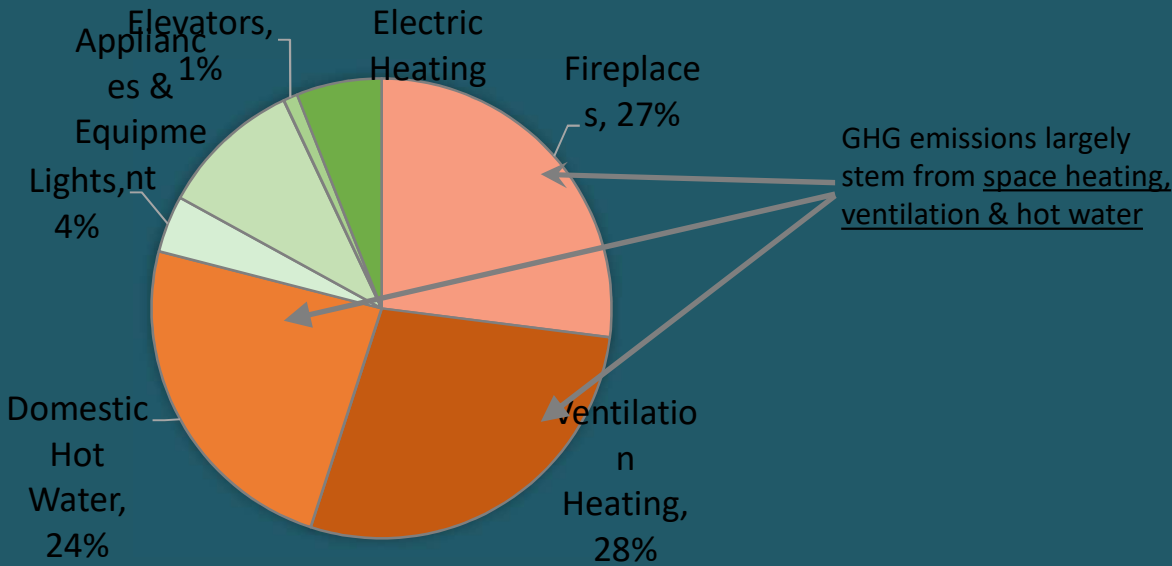
59% of total emissions

1.4 M tCO₂e

90% of building emissions are from methane gas



EMISSIONS BREAKDOWN



Source: Energy Study, RDH Building Science 2012

2007

2017

-7%

CARBON POLLUTION
IN VANCOUVER

-1.2M
TONNES CO₂e

2030
TARGET
-50%

CLIMATE EMERGENCY CONTEXT

Archetype E

05



Large multi-storey homes, built pre-1950. These homes are natural gas heated with natural gas hot water systems. They have low levels of insulation in the ceiling, walls and foundation and do not contain energy star rated windows and doors.

Average annual energy costs: \$2,831

Client Implications:

These homes are very energy intensive and produce **9.6 tCO₂e** on average. They represent 8% of dwellings that have been audited and 27% of the housing stock in the City of Vancouver.



Variable	Archetype E
Decade Built	pre-1950
Floor Area (m2)	226
Primary Heat Source	Furnace Continuous Pilot
Primary Fuel Type	Natural Gas
Primary Efficiency (%)	80
Heat Pump	No
Hot Water System	Conventional (pilot)
Hot Water Fuel Type	Natural Gas
Hot Water Efficiency (%)	0.554
Ventilation Type	None
Ceiling Insulation (RSI)	2.17
Wall Insulation (RSI)	1.22
Foundation Insulation (RSI)	0.92
Windows	24
Doors	3
Windows (RSI)	0.39
Doors (RSI)	0.59
Electricity Consumption (kWh)	9325.20
Natural Gas Consumption (GJ)	183.39
Energy Score (GJ)	216.96
Carbon Score (tCO ₂ e)	9.64 Lightspark

WHAT'S THE GOAL?

All homes to use 100%
renewable energy by 2050



New!

New Construction Focus

Aimed at new
low rise
residential
construction
and new work

Image Courtesy dlp Architecture

CITY OF
VANCOUVER

GREENEST
CITY

Effective Dates

January 1 2022
Most VBBL changes

June 1 2021
2 Ton limit for
homes 325m²+

LOW-RISE
IS NEARLY

70%

6%
MIXED-USE

26%
MID-/HIGH-RISE
(>4 STOREYS)

CITY-WIDE
BUILT RESIDENTIAL
FLOOR AREA
(2014-18)

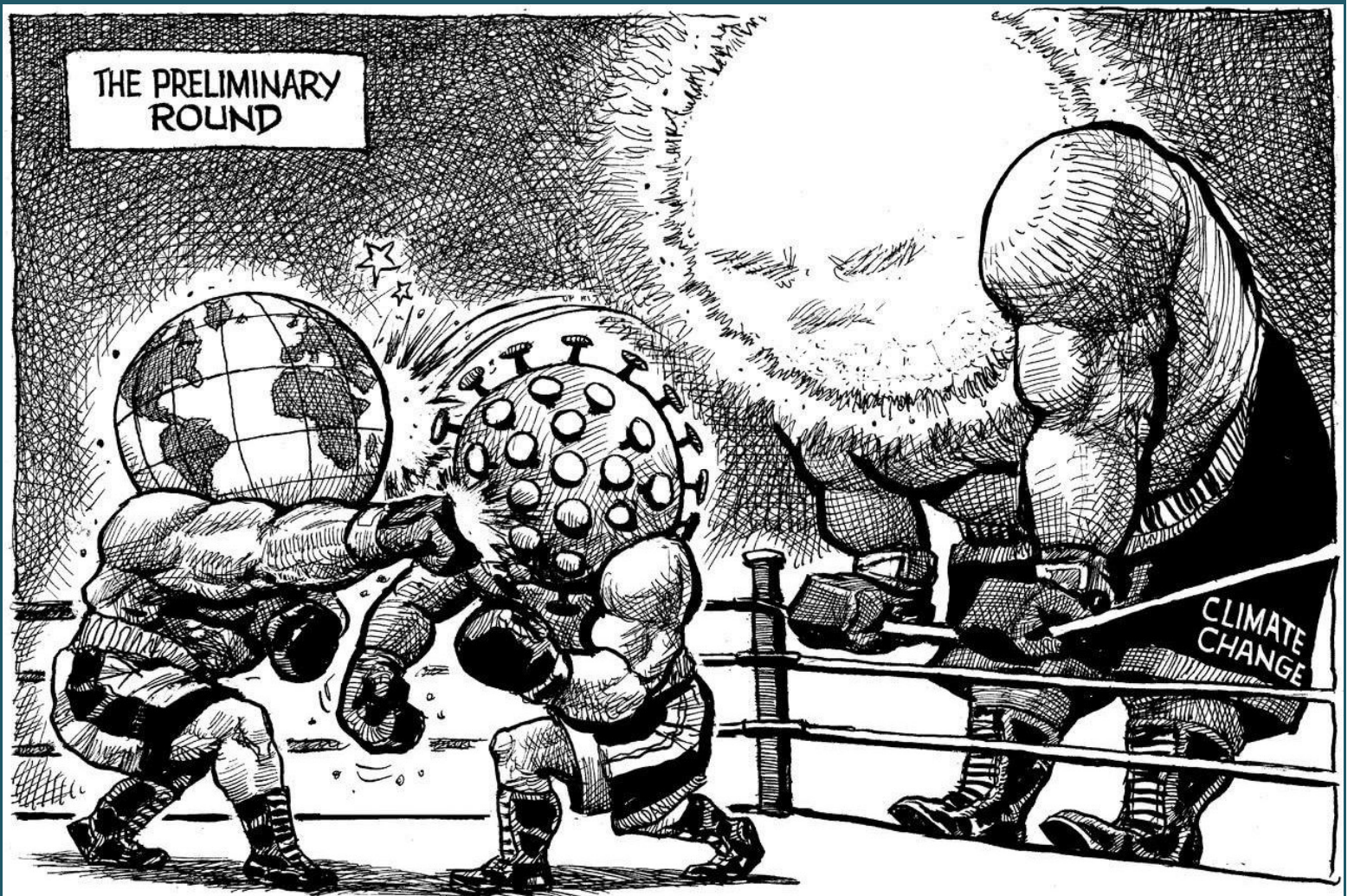
BC ASSESSMENT (2019)

55%
SINGLE-
FAMILY

5%
LOW-RISE
(≤4 STOREYS)

9%
DUPLEX, TH,
RH, MCD

Why Now?



Economist.com

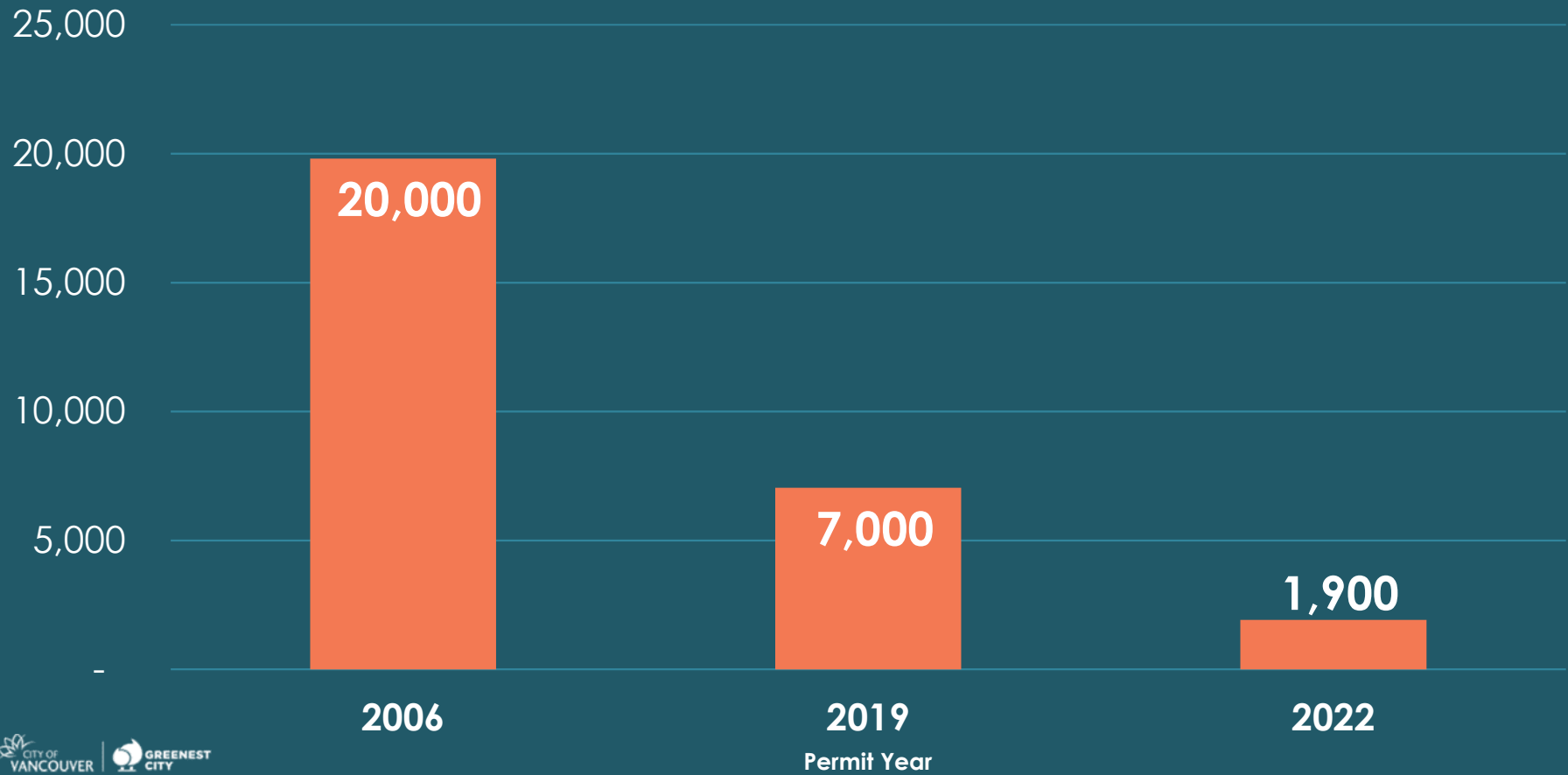
Kal



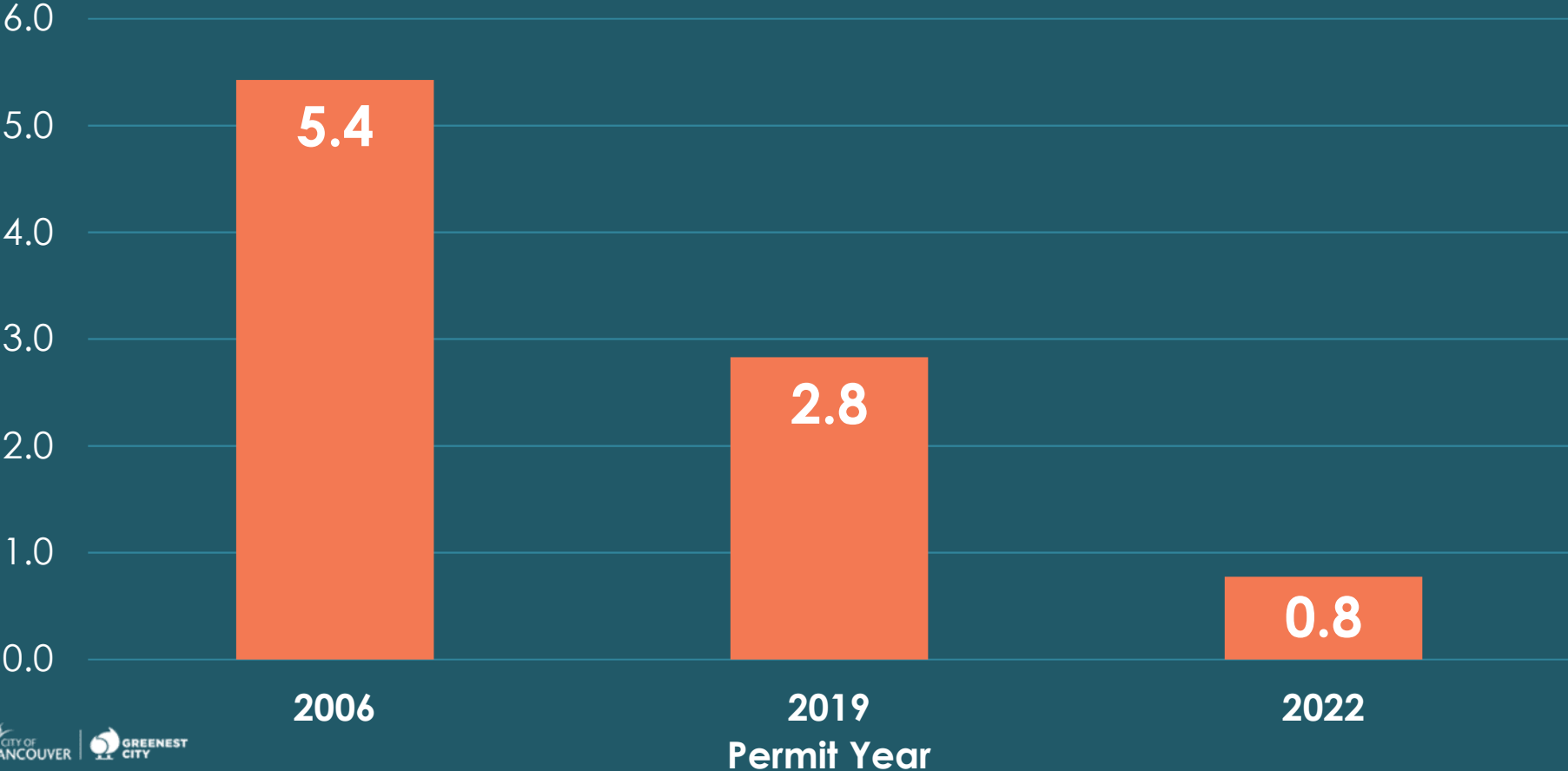
Goals & Approach

Image Courtesy: SMALLWORKS

Single Family Home Space Heating Needs (kWh annual, rounded)



Single Family Home Carbon Pollution (Tonnes Annually)



Alignment

Higher Buildings

3kg/m²
annual carbon
pollution limit
since 2018

West Vancouver

3kg/m²
annual carbon
pollution limit
since March 9,
2020

BC Energy Step Code

Vancouver
requiring metrics
of Step 4 and
3kg/m²
annual

3

tonne limit
at present

Large Homes 325m²+

2

tonne limit
recommended

Three Paths

Performance Path
Metrics of Step 4 of
the BC Step Code

+ GHGI 3kg/m²/yr

+ Prescriptive
Minimum

Or
Prescriptive Path
Or
Passive House

Prescriptive Highlights

Component	All Homes	Homes with 30%+ Glazing
HRV Performance	75% SRE at 0C	
Window Performance	U 1.22	U 1.00
Air Tightness	2.5ACH or 1.7 NLA	
Space Heating	Electric (Heat Pump, etc)	
Water Heating	Electric	
Gas Fireplaces	60,000 BTU limit (2 typical)	
Flat/Cathedral Roofs	RSI 4.2 (R40)	
Energy Model (Hot 2000)	Yes	
Heating Permit	Yes	

Air to Water Heat Pump Training

CIPH-BC

Canadian
Institute of
Plumbing and
Heating

TECA

Thermal Energy
Comfort
Association

BCIT

British Columbia
Institute of
Technology



Outcomes

Image Courtesy ONE SEED Architecture

Outcomes

Significant

A carbon pollution reduction of **63%** compared to 2019 and **86%** compared to our 2007 baseline

Aligned

Aligning with the BC Step code and Energy Star (national) opens business opportunities

Responsible

A responsible transition developed with our local industry and improved home resilience



Image Courtesy dlp Architecture

Thank You

 CITY OF VANCOUVER

 GREENEST CITY