Energy Retrofit Strategy for Existing Buildings

(Retrofit Strategy)

June 25, 2014

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- STRATEGY
- FOCUS ON OPPORTUNITY SECTORS
- SUPPORT VOLUNTARY ACTION
- OTHER TOOLS
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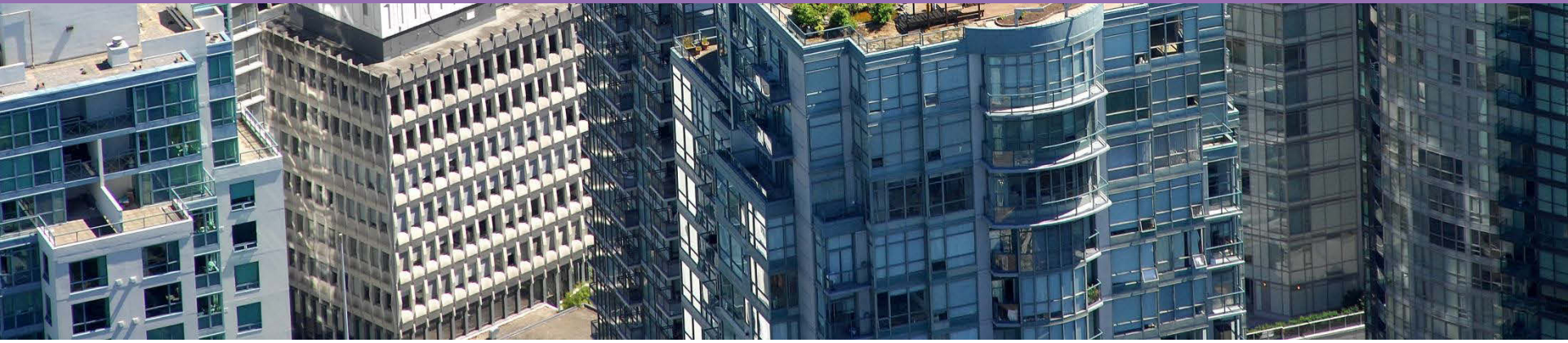
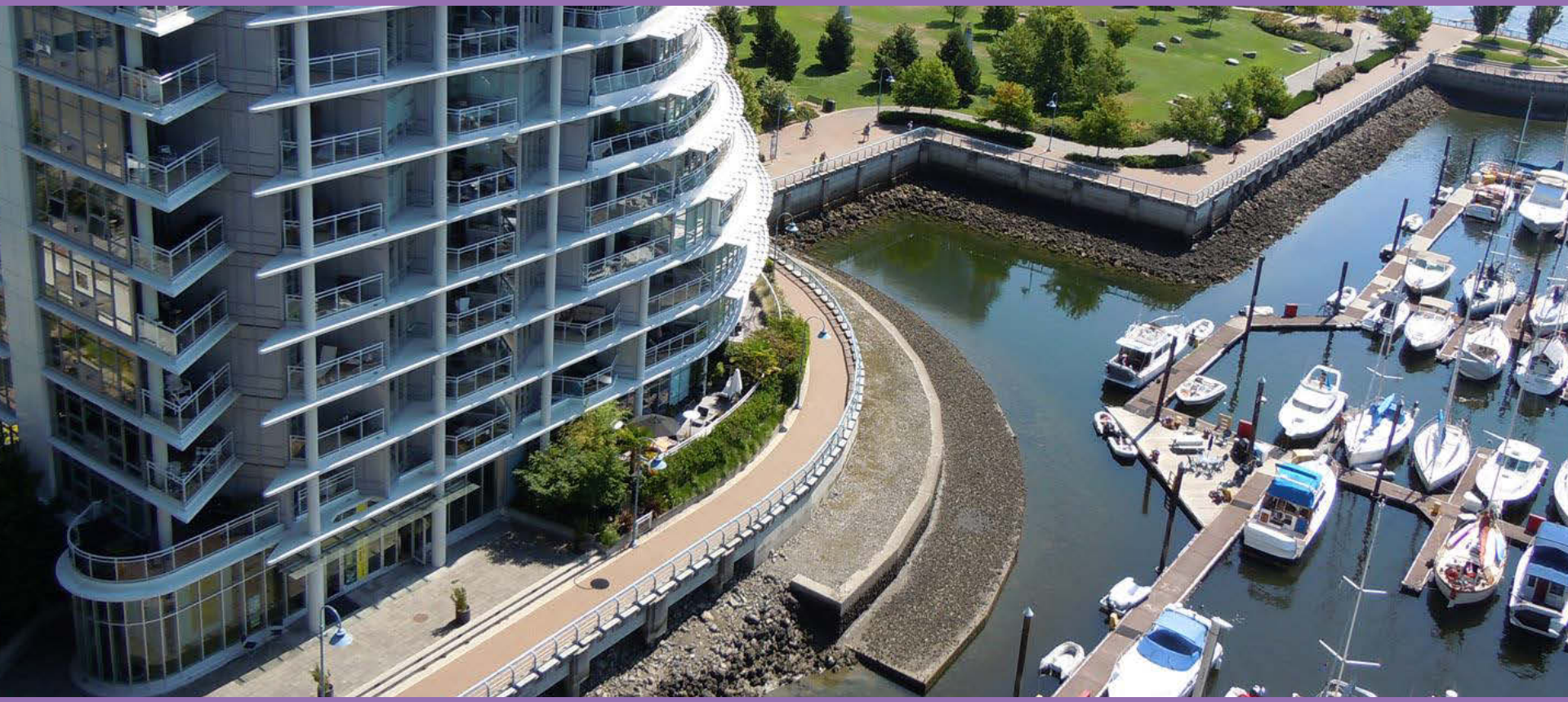
BACKGROUND ON RETROFITS



We have a variety of building types in Vancouver. There are…

77,000 houses and duplexes with 106,000 units…

5,700 apartment and condominium buildings with 174,000 units…



5,200 commercial and institutional buildings

with over 114 million square feet…

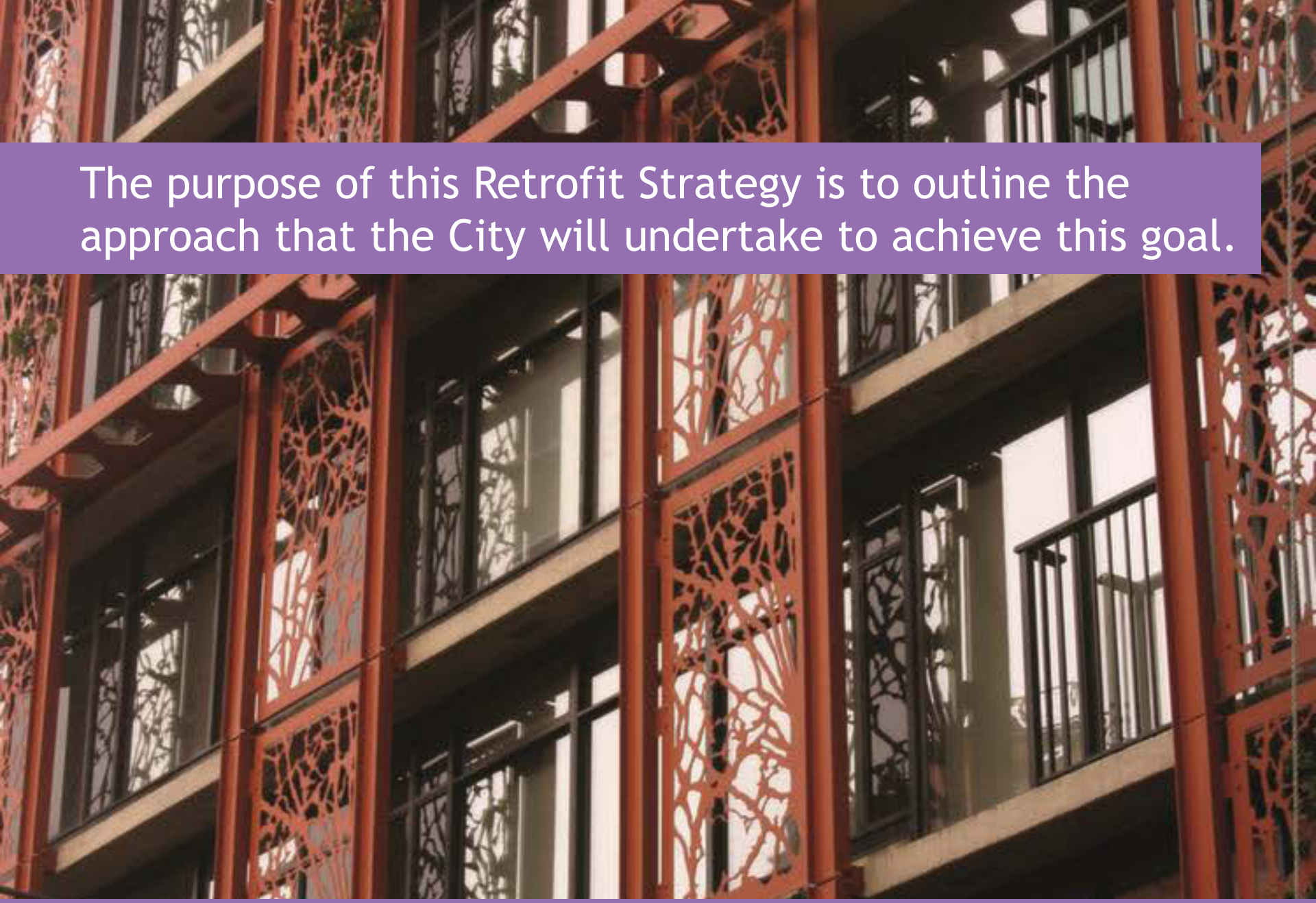
And 250 industrial facilities.

Collectively these buildings cost **$550 million** to heat and power each year ...

producing **1.6 million** tonnes of GHGs per year, which is just over 55% of the Vancouver community GHGs.

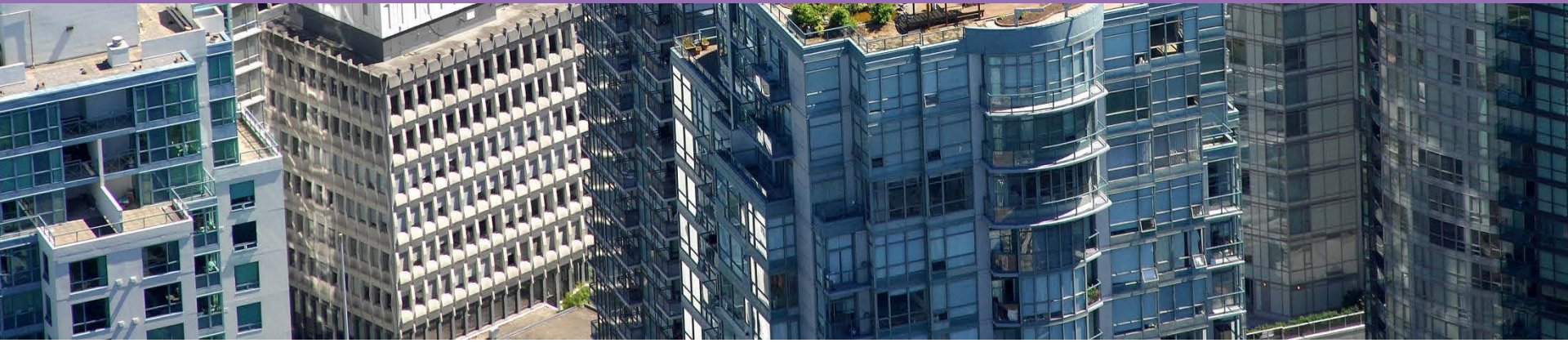
The Green Building target in the Greenest City Action Plan calls for reducing these emissions by 20% by 2020; which if we succeed …

… Vancouver residents and businesses could save over $90 million and 160,000 tonnes of GHGs per year by 2020.



The purpose of this Retrofit Strategy is to outline the approach that the City will undertake to achieve this goal.

STRATEGY PURPOSE



The City is aiming to reduce city-wide GHG emissions by 33%

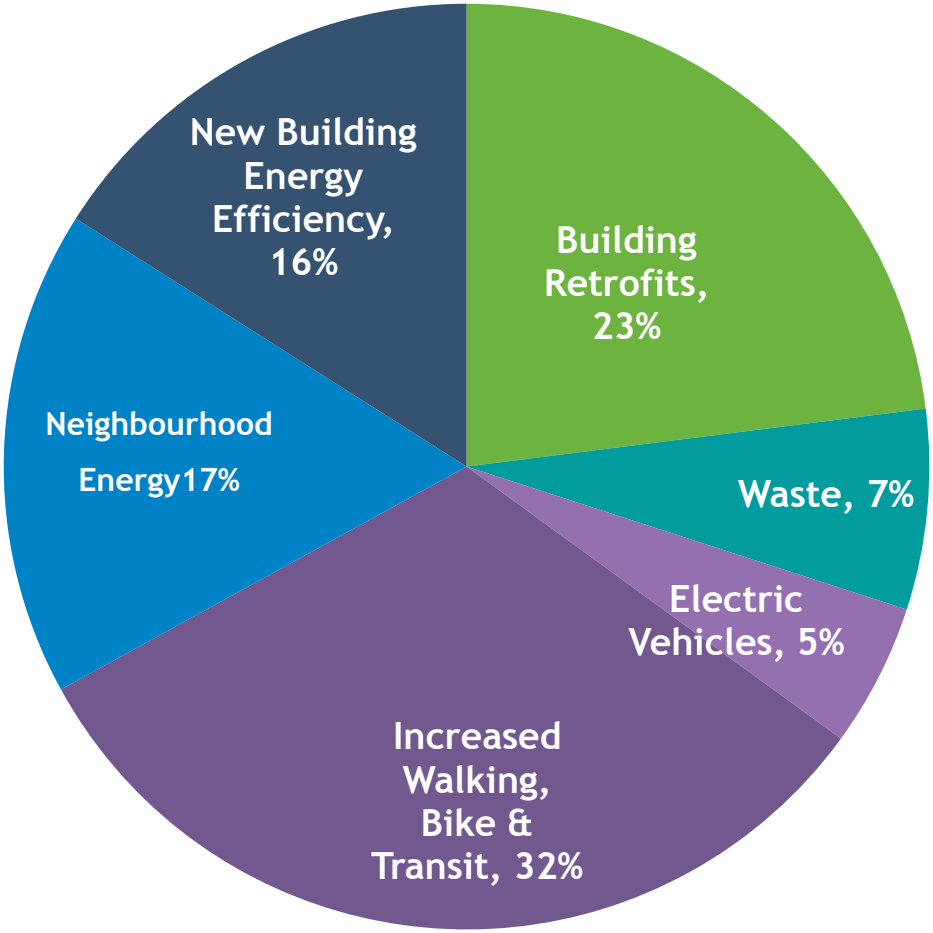
and reduce GHG emissions in existing buildings by 20% by 2020.

Greenest City Action Plan

ZERO CARBON	Climate Leadership	Lighter Footprint	Green Economy
	Green Transportation		
	Green Building		
ZERO WASTE	Zero Waste		
HEALTHY ECOSYSTEMS	Access to Nature		
	Clean Water		
	Local Food		
	Clean Air		

55% of total GHG emissions are from buildings:

Nearly a quarter of planned GHG reductions* from building retrofits.



The Greenest City Action Plan targets 160,000t of GHG reductions from existing building retrofits

* Excluding targeted reductions from Provincial legislation on vehicle fuel standards, vehicle efficiency and clean power.

Barriers to Retrofitting Our Buildings:

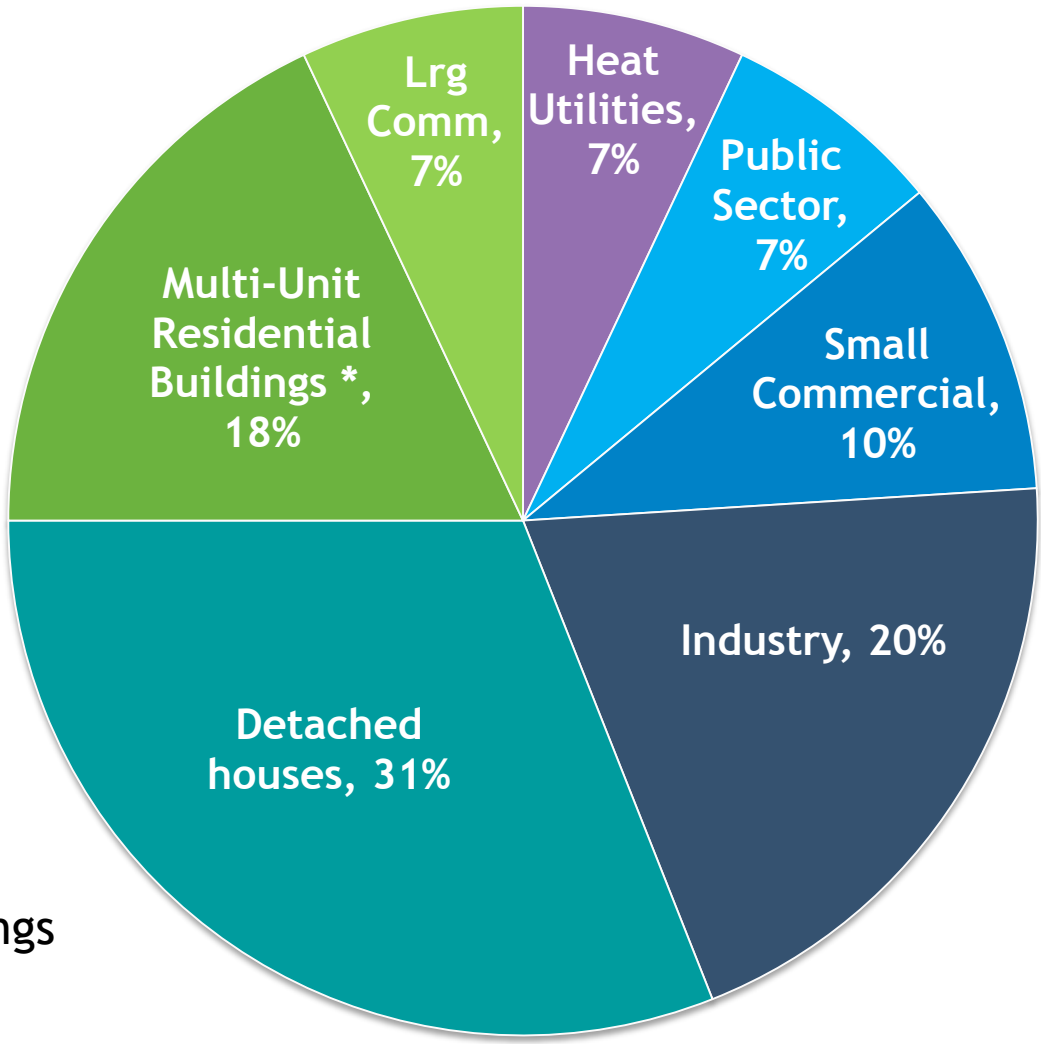
- Hard to access and compare energy use data
- Low owner awareness of cost saving opportunities
- Competing demands and lack of owner expertise
- Low natural gas prices

Opportunities:

- Improve housing affordability by reducing energy costs
- Support green jobs
- Pilot new approaches
- Leverage and enhance existing incentives through partnerships with BC Hydro, Fortis BC, and strong industry associations

STRATEGY

Building-related GHG emissions by building sector:



* Multi-unit Residential Buildings (MURBs) include both rental apartment and strata condominium type buildings

Vancouver's Strategic Retrofit Approach

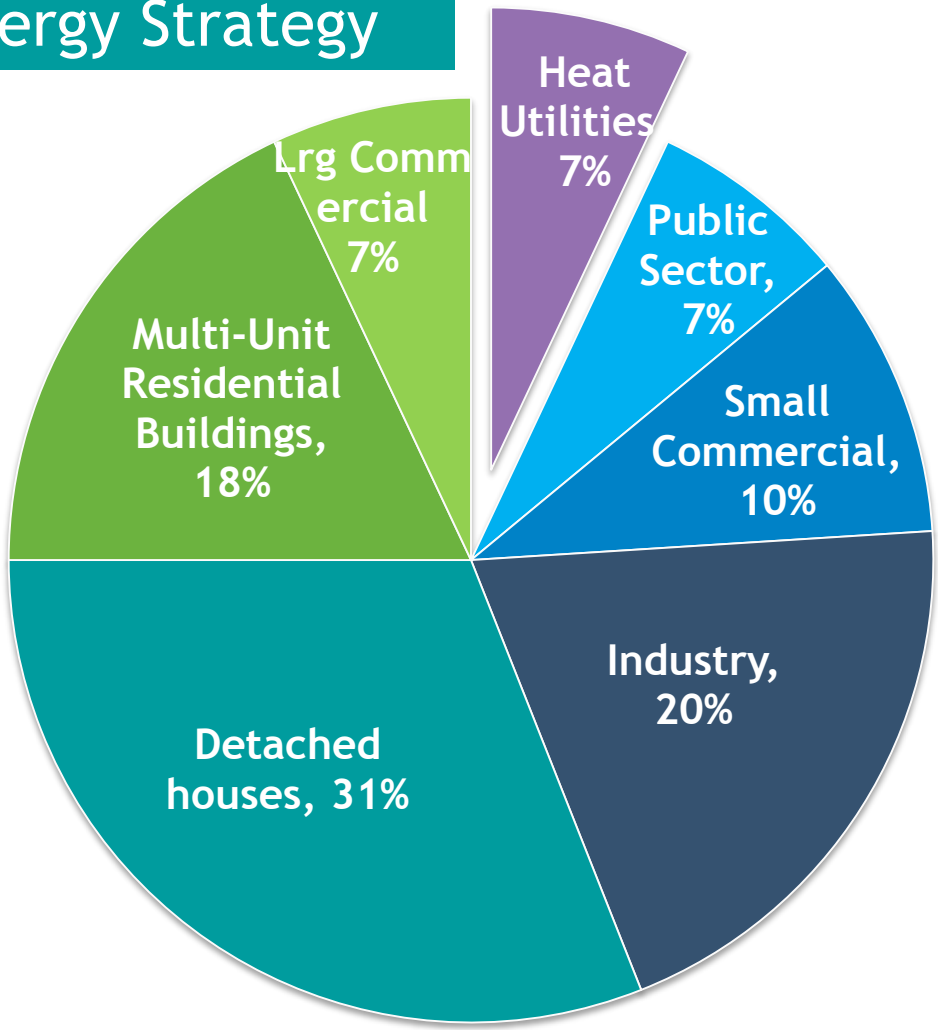
1. Focus on Highest Opportunity Sectors

2. Apply Sector Specific Approaches to Support Voluntary Action

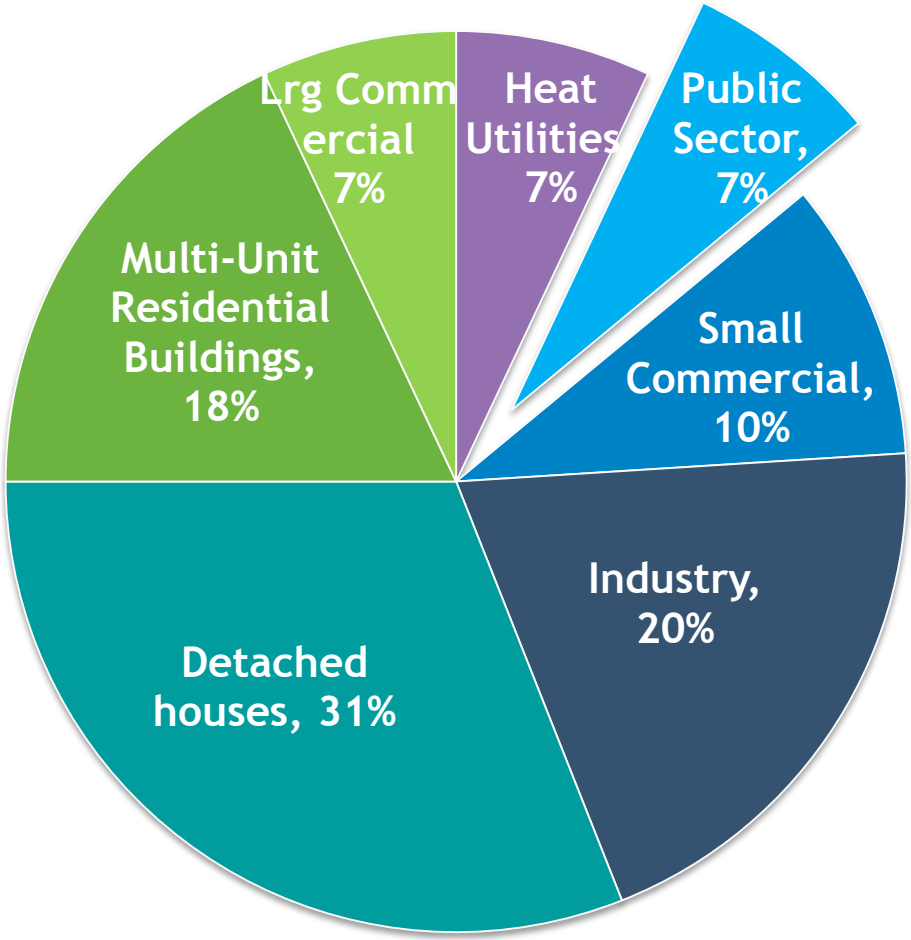
3. Utilize the Vancouver Building Bylaw

1. FOCUS ON LARGEST OPPORTUNITIES

We are already working to reduce emissions as part of the Neighbourhood Energy Strategy

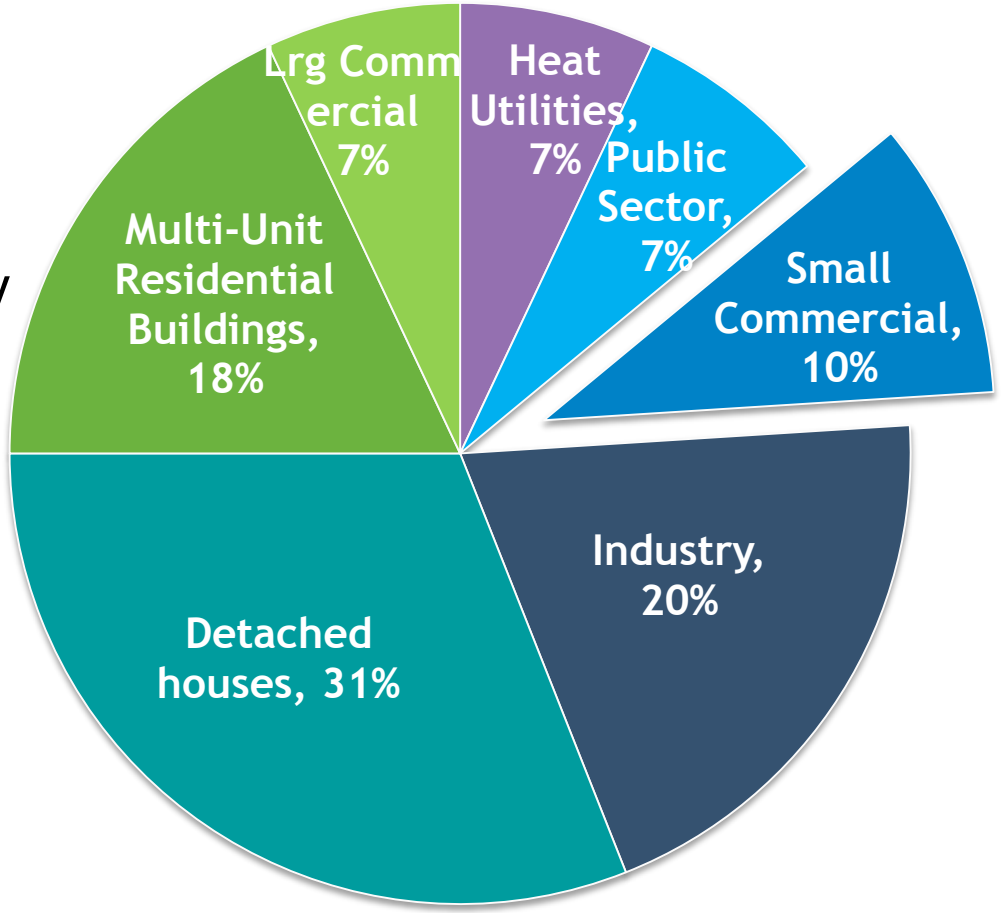


Local, provincial and federal governments are already taking action on public sector buildings



Small commercial, small industrial, and small multi-unit residential (MURBs) are ***NOT an initial focus*** for new City action

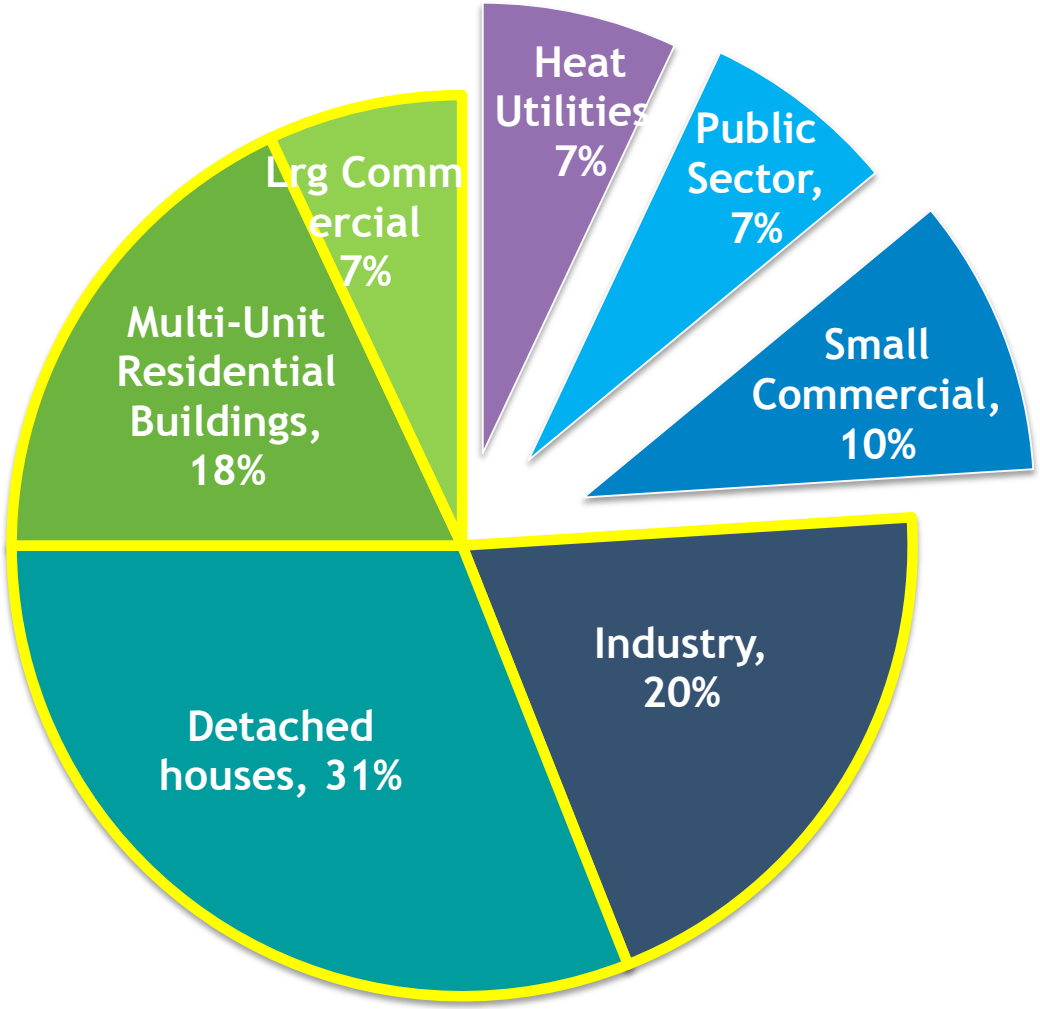
- Building stock, ownership models and equipment are very diverse.
- Large number of small owners and operators, each with small GHG emissions.
- Difficult to engage



Focus on building sectors where additional City action

Would have the biggest GHG reduction impact:

1. Large commercial
2. Multi-unit residential buildings (MURBs)
3. Detached houses
4. Industry

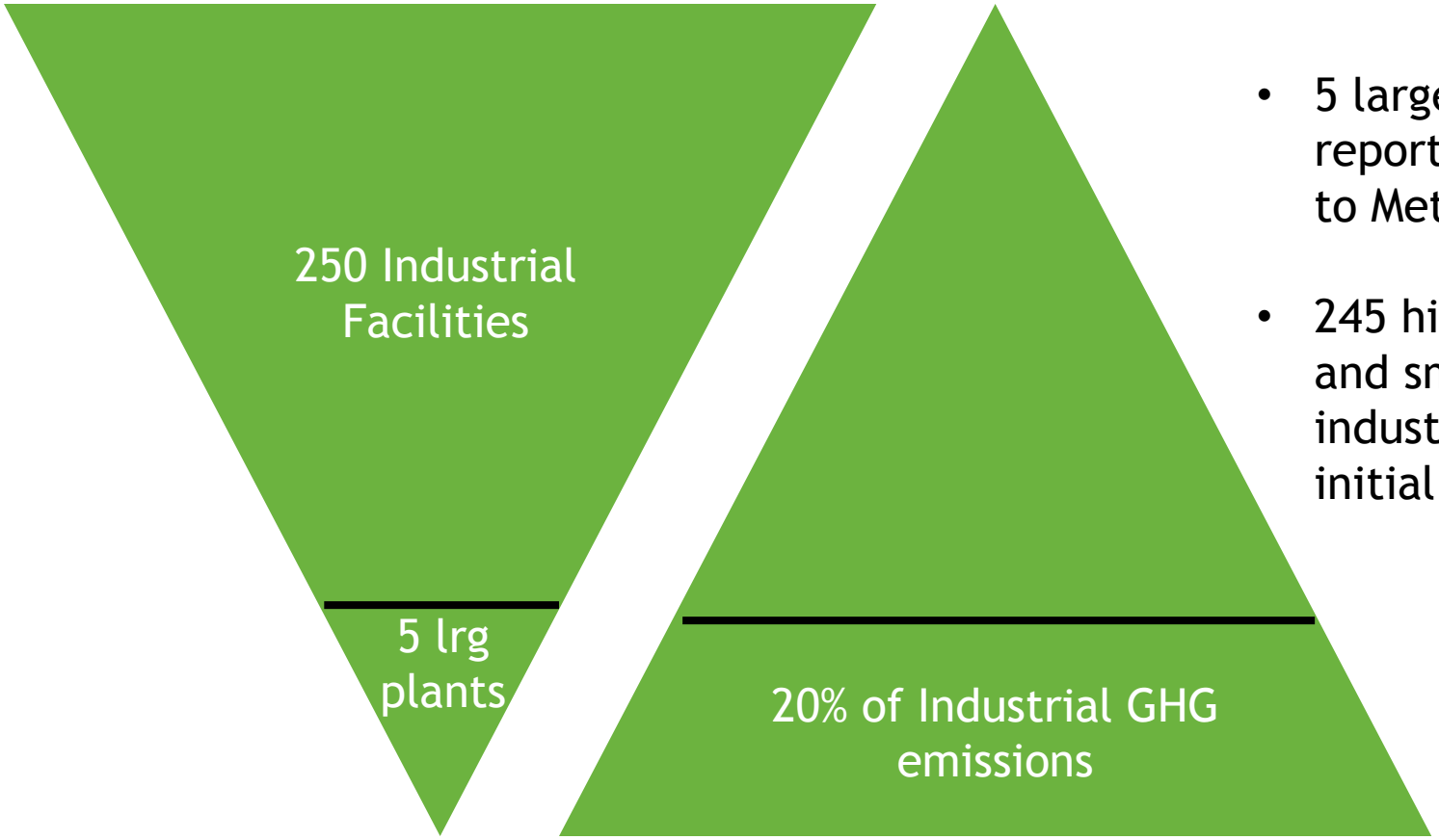


2. SECTOR SPECIFIC APPROACHES

Sector specific strategies:

- Focus on biggest industrial emitters
- Support uptake of existing programs

1. Focus on largest industrial emitters



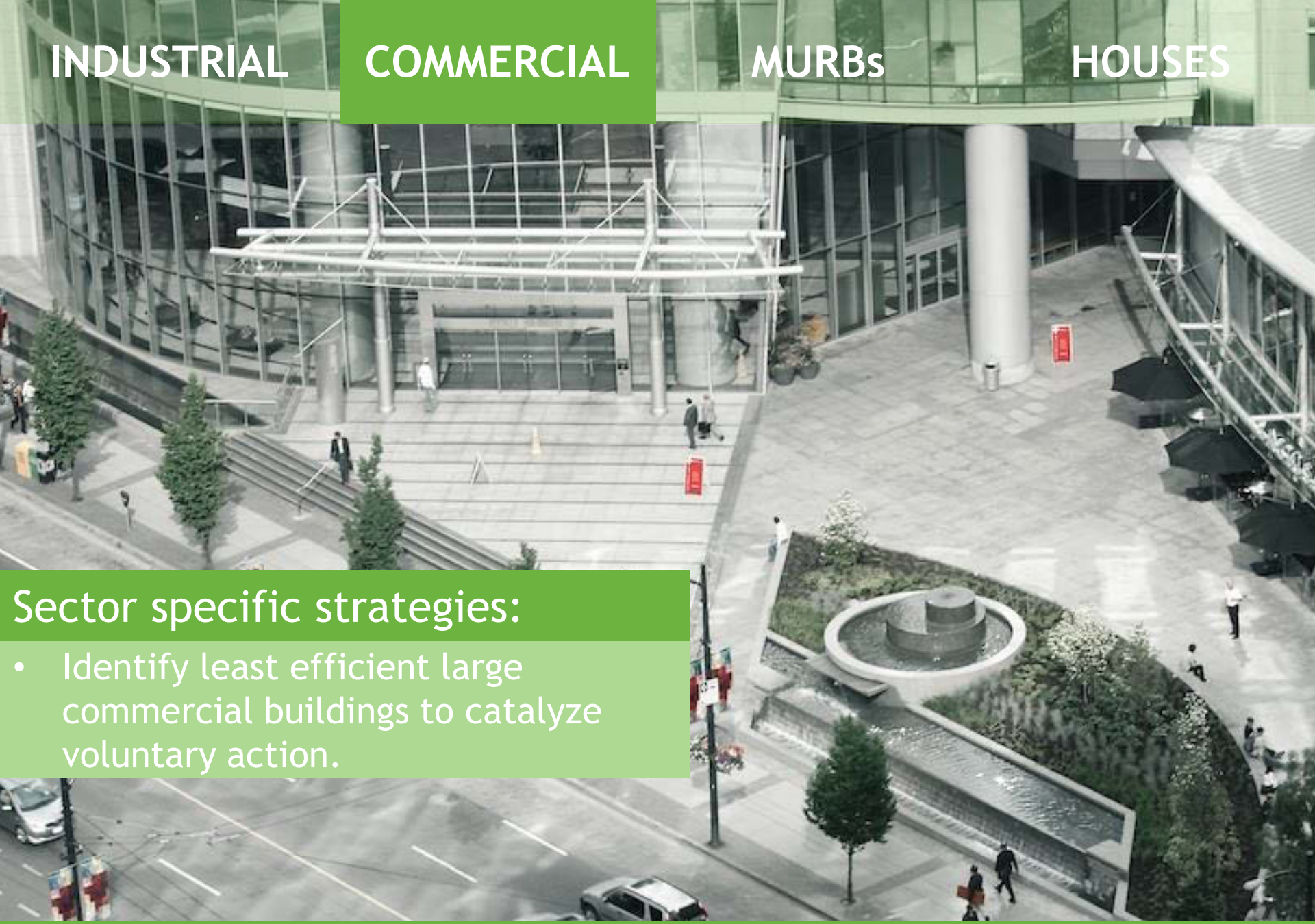
- 5 large industries report GHG emissions to Metro
- 245 highly diverse and small impact industries not part of initial focus

CITY ACTION

Promote participation in FortisBC facility audit, support retrofit business case development, and foster uptake of existing incentives

CITY ACTION

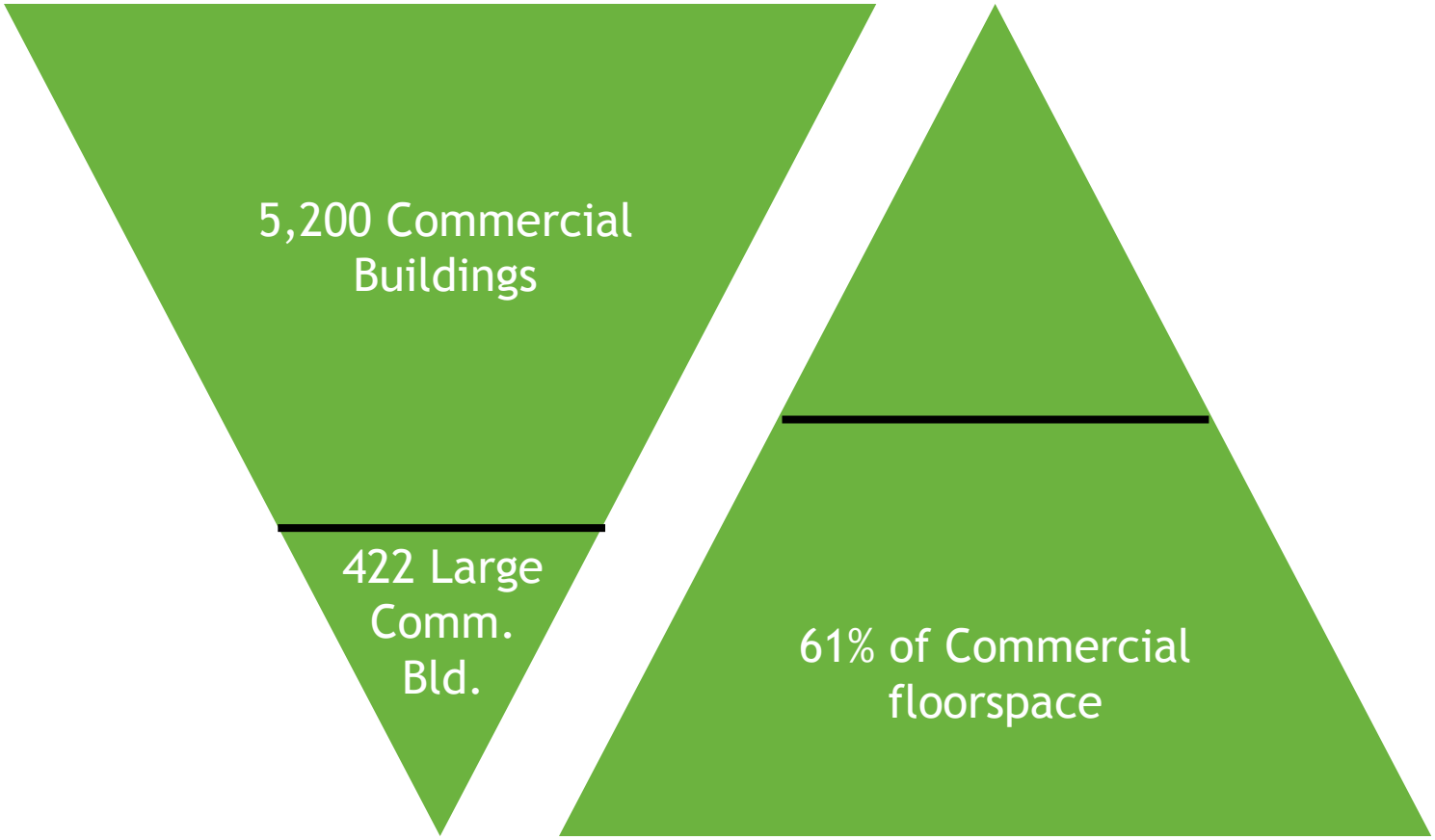
Assess need for supplementary incentives and make recommendations to FortisBC and/or Council as required.



Sector specific strategies:

- Identify least efficient large commercial buildings to catalyze voluntary action.

1. Focus on the largest commercial buildings



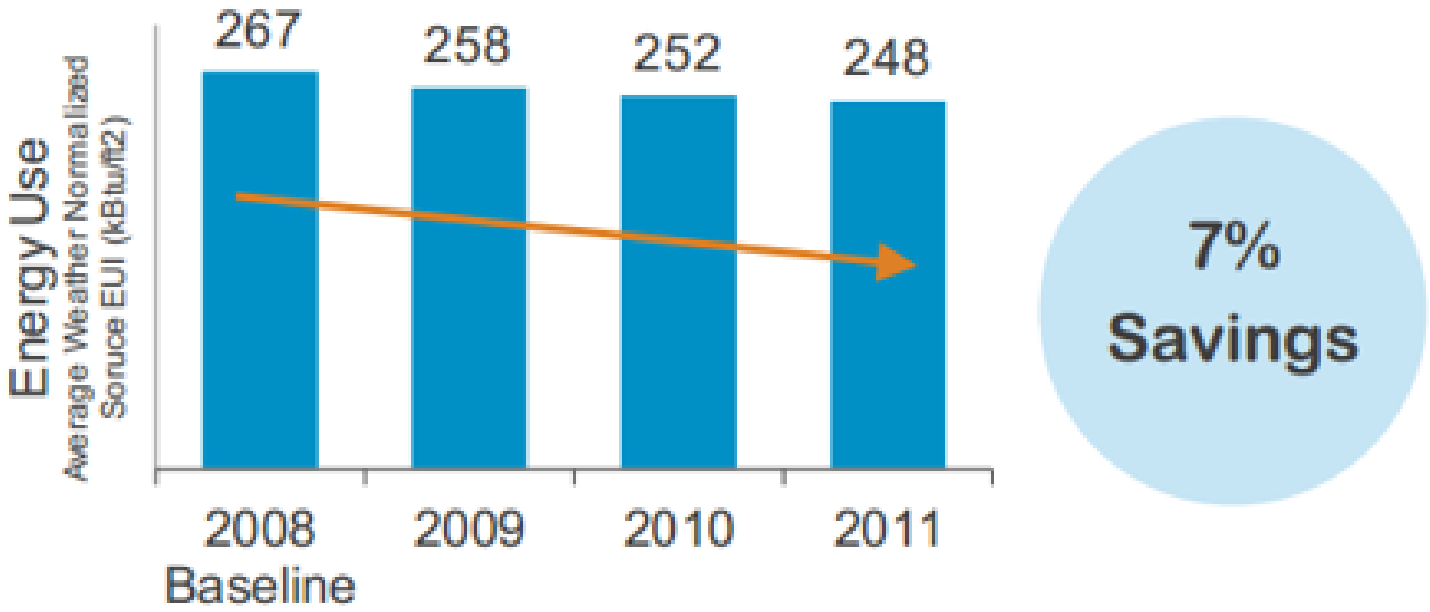
1. Focus on the largest commercial buildings

- Strong leadership by BOMA
- Well managed buildings within a competitive industry with capacity to implement retrofits
- Good existing incentive and support programs from BC Hydro and Fortis
- Primary gap in this sector is mechanism to easily identify least efficient buildings to catalyze voluntary efficiency improvements

2. Identify the least efficient of the large commercial buildings by energy benchmarking

Energy benchmarking for buildings:
the collection, comparison, and sharing of building energy use data and ratings.

Buildings that participated in energy benchmarking realized energy savings of 7% over 3 years (US EPA).



Sample of U.S. cities that require energy benchmarking:

City	Commercial	MURB	Disclosure			Rating System
			To Gov't	Via Website	At time of Transaction	
Austin	10,000+ SF		Y		Buyer	Energy Star
Boston	35,000+ SF	35+ units 35,000+ SF	Y	Y		Energy Star
Chicago	50,000+ SF	50,000+ SF	Y	Y		Energy Star
New York	50,000+ SF	50,000+ SF	Y	Y		Energy Star
San Francisco	10,000+ SF		Y	Y	Buyer Lessee	Energy Star
Seattle	20,000+ SF	20,000+ SF	Y		Buyer Lessee	Energy Star

Additional important benefits of energy benchmarking:

- provides data to inform development of programs and policies
- enables evaluation of programs and policies
- Publicly available benchmark ratings support market demand for improved energy performance

CITY ACTION

Support voluntary benchmarking by large commercial and MURB portfolio owners by providing training, call centre guidance, etc.

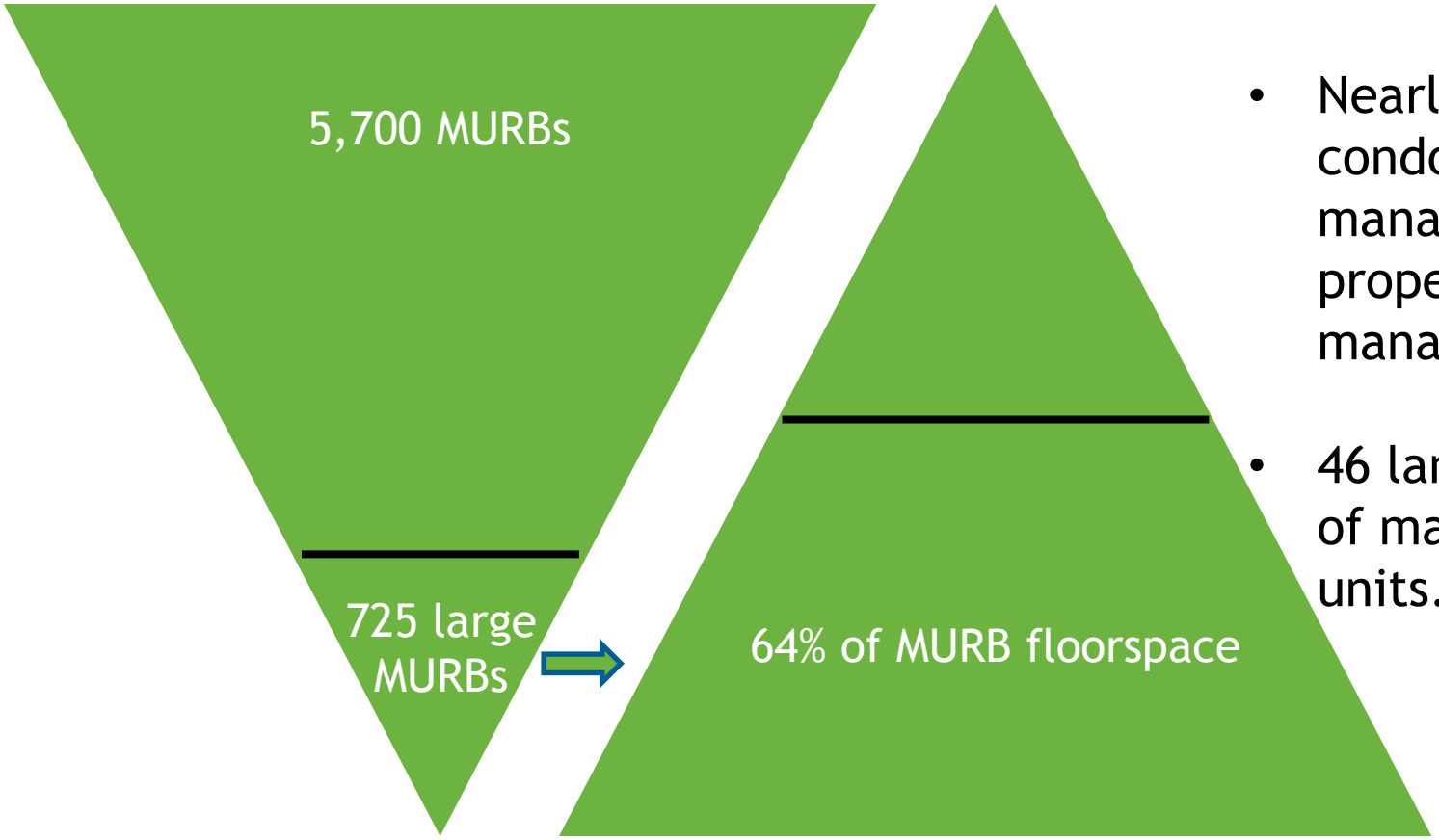
CITY ACTION

Consult with stakeholders and develop an approach to data sharing and ensuring benchmarking for all commercial buildings >50,000 ft^2 .

Sector specific strategies:

- Focus on largest and least efficient Multi-unit Residential Buildings (MURBs).
- Provide targeted support.

1. Focus on the largest MURBs



- Nearly all large condo buildings are managed by 8 property management firms.
- 46 landlords own 60% of market rental units.

2. Identify the least efficient MURBs using Energy Benchmarking

3. Additional City support for voluntary energy efficiency action is required for MURBs

- MURBs include both rental apartment and condominium strata type buildings
- Limited owner investment in building improvements and limited capacity/expertise to implement energy improvements
- Limited awareness of energy efficiency opportunities and incentives
- Current City "Green Landlord" pilot is proving to be successful

Green Landlord pilot:

City support for **21** Vancouver rental apartment buildings included:

- energy and water efficiency **audits**
- retrofit **business cases** that leverage Hydro/Fortis incentives
- Average GHG reduction of 16% and payback on owner investments of 2.5 years
- low-flow toilet incentives (will reduce 23 million litres water use/year)
- LandlordBC emerged as a strong partner

Participating buildings have committed to undertaking identified energy efficiency improvements

BC Hydro and FortisBC have now launched Green Landlord Programs

CITY ACTIONS

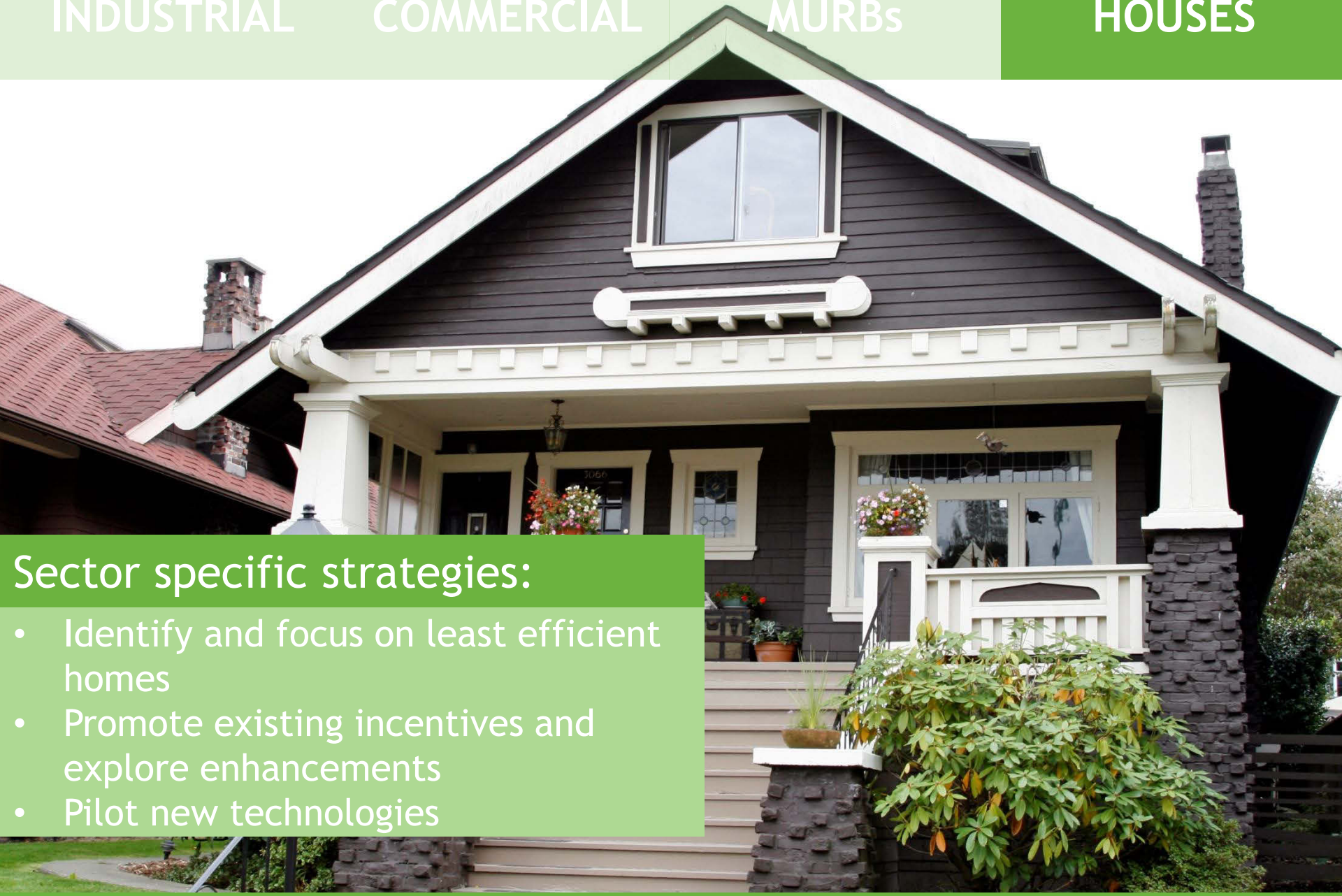
Support voluntary MURB energy benchmarking and seek changes to Vancouver Charter to enable benchmarking regulation

CITY ACTION

Partner with BC Hydro, FortisBC, and LandlordBC to expand the Green Landlord program and evaluate its effectiveness; make recommendations for enhancement (including additional incentives) as required

CITY ACTIONS

Undertake additional research and program design for Condominium and Non-market Rental Housing retrofits



Sector specific strategies:

- Identify and focus on least efficient homes
- Promote existing incentives and explore enhancements
- Pilot new technologies

1. Identify the least efficient houses and duplexes

- Data from the recently terminated Provincial LiveSmart and Federal ecoEnergy programs indicate that older houses are typically least efficient
- Additional tools, such as thermal imaging, need to be developed to better identify least efficient homes and to help catalyze incentive uptake

2. City support for voluntary energy efficiency action is required for houses

- Federal and Provincial incentives: terminated
- BC Hydro and FortisBC recently launched Home Energy Rebate Offer (HERO) program includes incentives (25% lower than peak historic levels)
- BC Hydro and FortisBC programs not fully taking advantage of emerging “smart” technologies (e.g. learning thermostats) for energy conservation in houses

City marketing of provincial and federal incentives resulted in over double the provincial uptake rate in Vancouver and significant GHG reductions.

Year	Van Audits	Van Renovations	% of buildings retrofit after the audit
2007	396	285	72%
2008	1286	937	73%
2009	2852	2276	80% (COV promotion begins)
2010	3221	2601	81%
2011	2989	2360	79%
2012	1842	1380	75% (end of federal incentives)
2013	495	212	43%
TOTAL	12,586	10,051	Program = 13,000t GHG reduction

CITY ACTION

Develop new tools to identify least efficient homes

CITY ACTION

Work with BC Hydro, FortisBC, and Heritage Vancouver to promote HERO incentives and pilot additional incentive approaches if required.

CITY ACTION

Pilot programs that leverage “smart” technologies such as learning thermostats to catalyze new utility incentive offerings

3. Other Tools

In 2014, energy retrofit requirements were included in the Vancouver Building By-Law (VBBL).

2014 VBBL Requirements for 1 and 2 Family Houses

Value of Permit	Action	Typical Cost	HERO Incentive	Typcial Annual Savings
> $5,000	EnerGuide assessment	$300	$0	$0
>$25,000	Assessment & weather sealing	$300 + $800 $1,100	$500	$300
> $50,000	Assessment, weather sealing, & attic insulation	$300 + $800 + $1400 $2,500	$500 + $600 $1,100	$600

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2014 VBBL Requirements for 1 and 2 Family Houses

Value of Permit	Requirement
> $5,000	EnerGuide assessment
>$25,000	Assessment & weather sealing
> $50,000	Assessment, weather sealing, & attic insulation

Regular updates to the VBBL energy retrofit requirements could reduce GHG emissions from existing buildings by 50,000 tonnes by 2020.

2014 VBBL Requirements for MURBs and Commercial Buildings

- Complex diversity in types of buildings and potential improvements
- Tables of energy efficiency options enable applicants to align required efficiency improvements with planned work

CITY ACTION

Research, consult industry, and propose improved energy efficiency requirements to incorporate into the VBBL in 2016 and for subsequent updates

CITY ACTION

Monitor the impact of VBBL requirements and propose additional regulatory approaches if necessary.

SUMMARY

Key strategies and impacts by sector

	Inst.	Houses	MURBs	Comm.	Industry	TARGET REDUCTION (tonnes GHG per year by 2020)
Government Commitments	✓					11,000
Benchmarking			✓	✓		19,000
Support Voluntary Improvements		✓	✓	✓	✓	80,000
Regulations	✓	✓	✓	✓	✓	50,000
TARGET REDUCTION (tonnes GHG per year by 2020)	27,000	31,000	29,000	40,000	33,000	= 160,000

Summary

- Targeted reduction of 160,000 t of GHG emissions/year by 2020 is challenging and important
- Residents and businesses could save over $90 million/year by 2020 if target is achieved
- Focus support for voluntary action on highest opportunity building sectors
- Leverage existing incentives
- Pilot new approaches and incentives as required
- Partner with utility and industry associations
- Continue to evolve the Vancouver Building Bylaw