

Vancouver's Evolving Integration of Renewable District Energy Systems and Green Building Approaches



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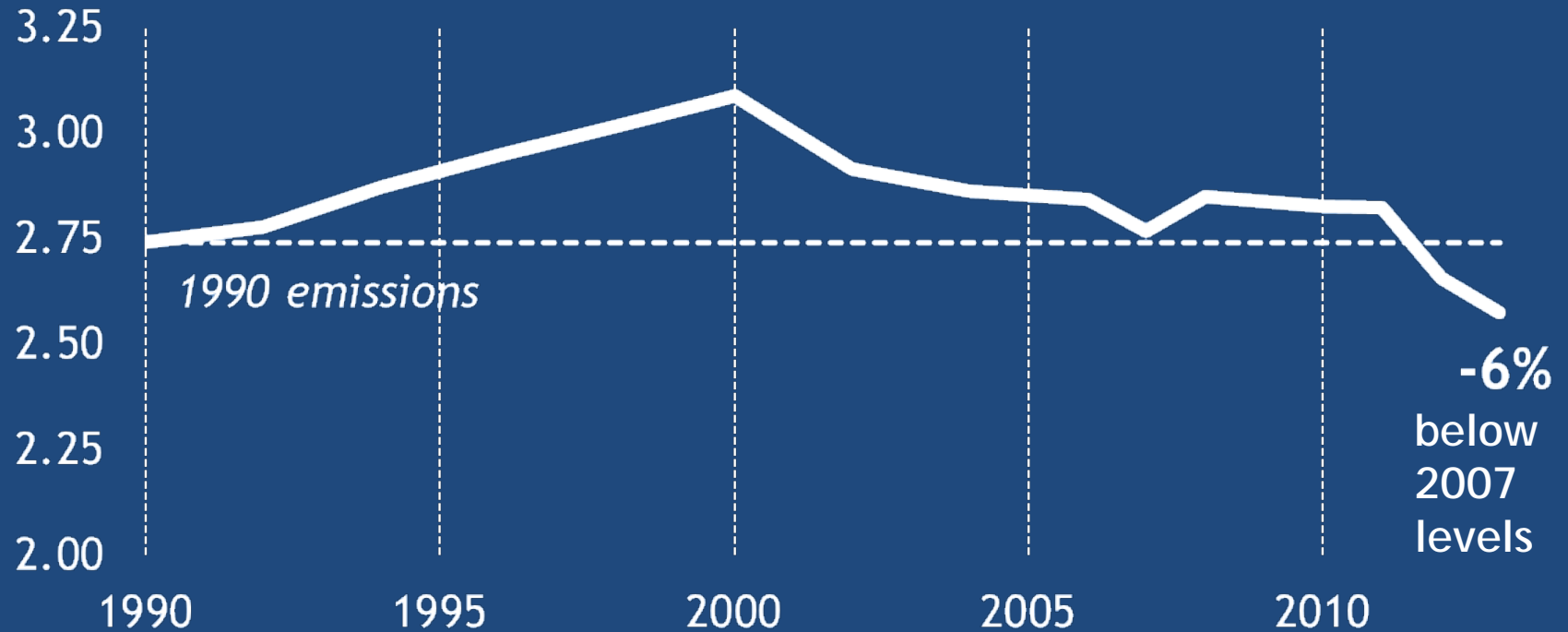
ZERO CARBON 	Climate Leadership	Lighter Footprint	Green Economy
	Green Transportation		
	Green Building		
ZERO WASTE 	Zero Waste		
HEALTHY ECOSYSTEMS 	Access to Nature		
	Clean Water		
	Local Food		
	Clean Air		

GREENEST CITY FRAMEWORK

3 HIGH-LEVEL OBJECTIVES

10 GOAL AREAS

Vancouver Community GHG Emissions (MtCO₂e per year)

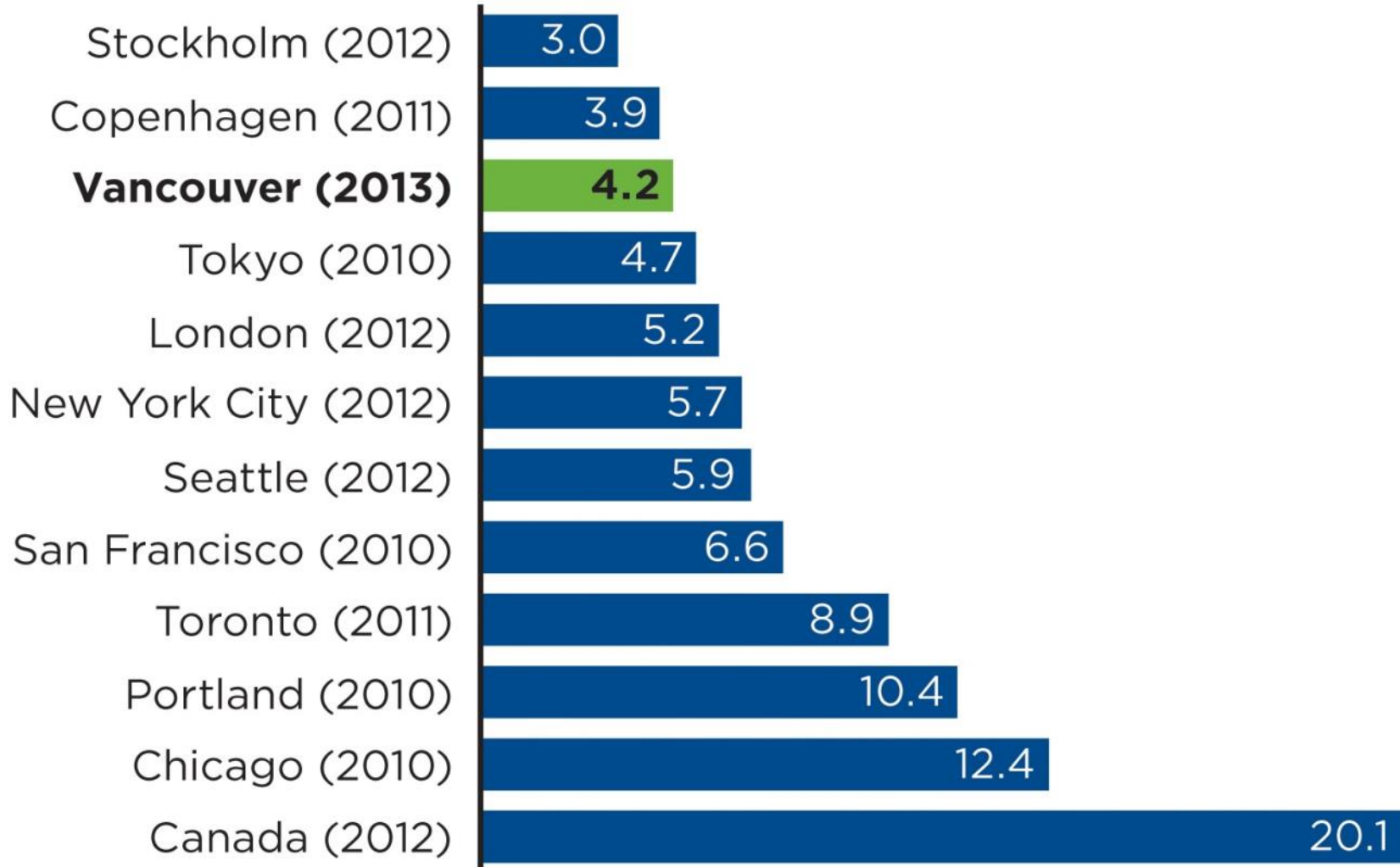


VANCOUVER'S EMISSIONS CONTINUE TO DECREASE:

Since 1990 population has increased 32% and number of jobs is up 28%

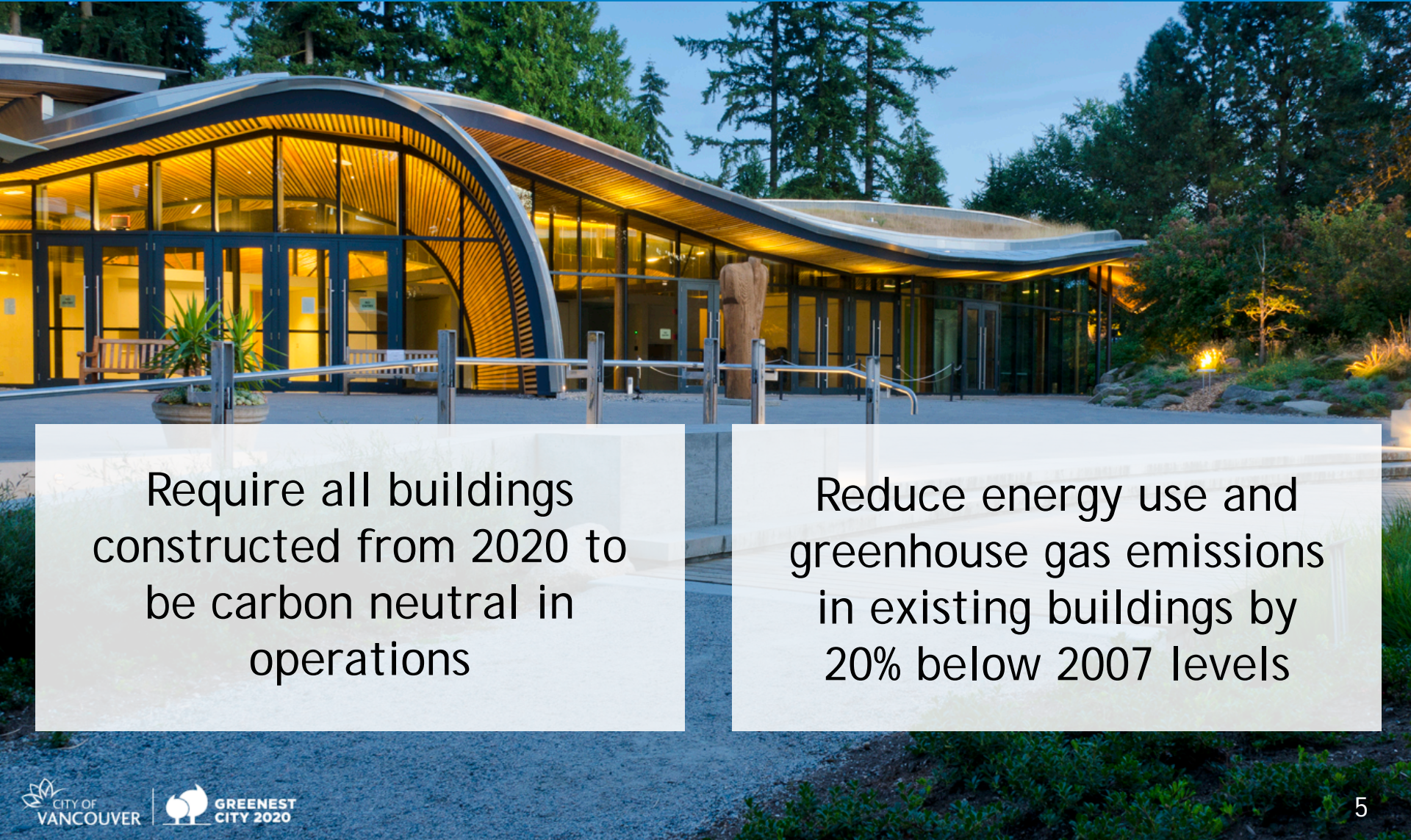
Greenhouse Gas (GHG) Emissions per capita

Metric tonnes CO₂e per capita



GREEN BUILDINGS

Lead the world in green building design and construction



Require all buildings constructed from 2020 to be carbon neutral in operations

Reduce energy use and greenhouse gas emissions in existing buildings by 20% below 2007 levels



RENEWABLE DISTRICT ENERGY SYSTEM FOR 2010 OLYMPIC VILLAGE = PARADIGM SHIFT

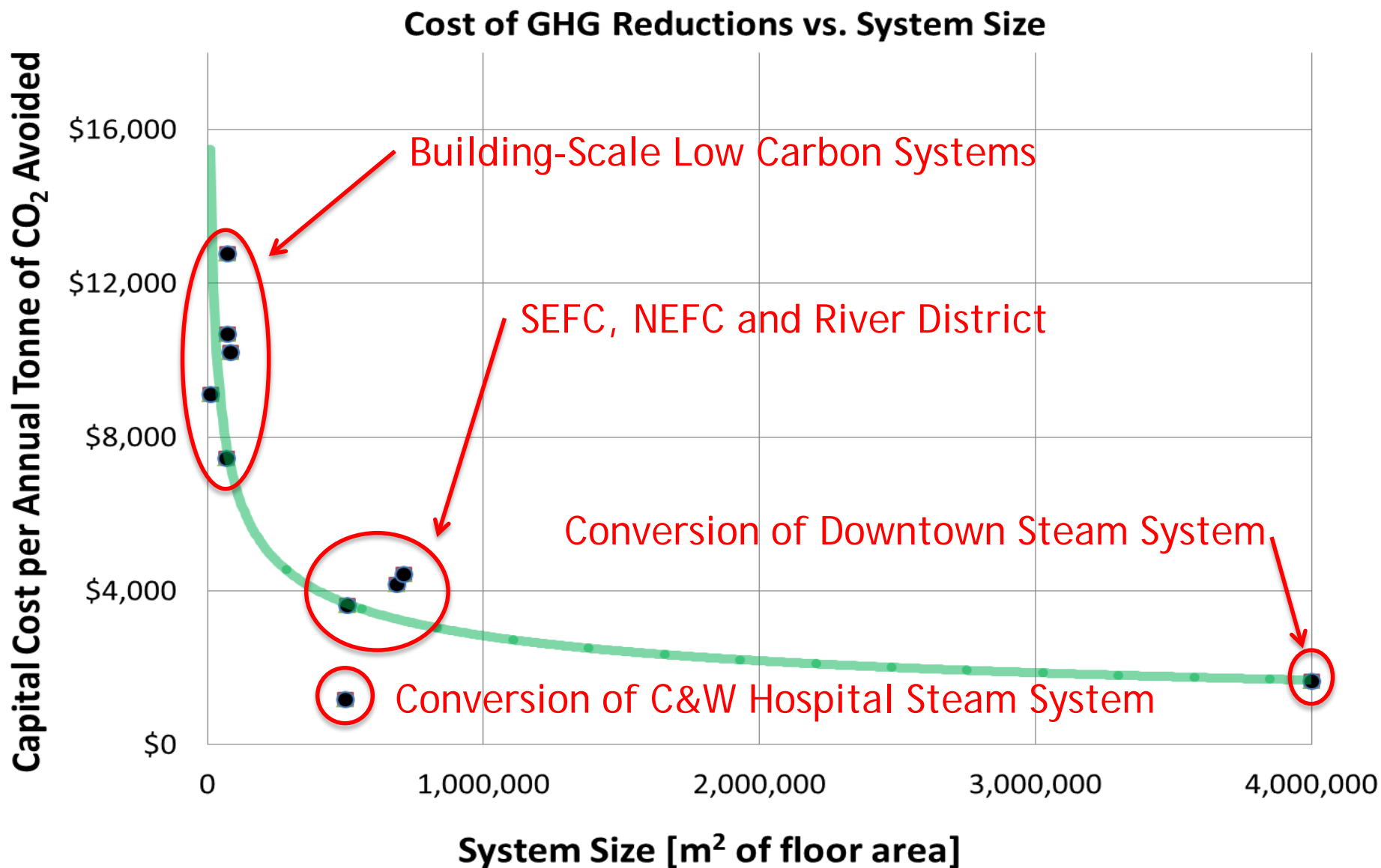
- 75% of demand from renewable sources (waste heat from sewer system) and 60% reduction in GHGs
- Village DE System has grown 260% since 2010; competitive customer rates



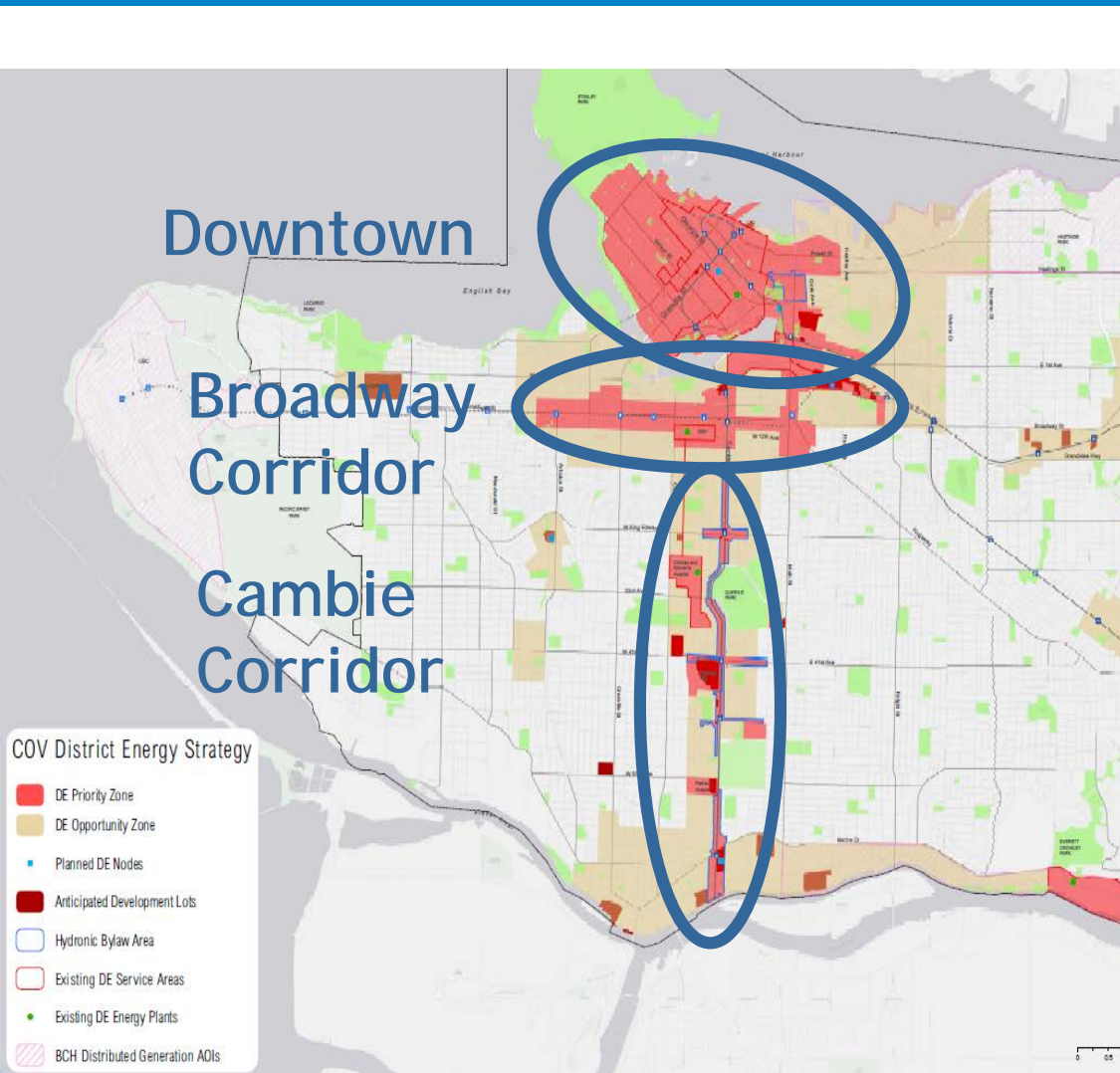
FUNDAMENTALS

- Neighbourhood scale makes renewable technologies more cost effective and overcomes split-incentive barrier
- Higher upfront capital costs for renewable energy amortized over 25 years and repaid via operating cost savings
- New technologies can be adopted at district scale instead of building by building; instant low-carbon retrofits!

Economies of Scale Make a Difference



STRATEGY AND TOOLS FOR SUCCESS



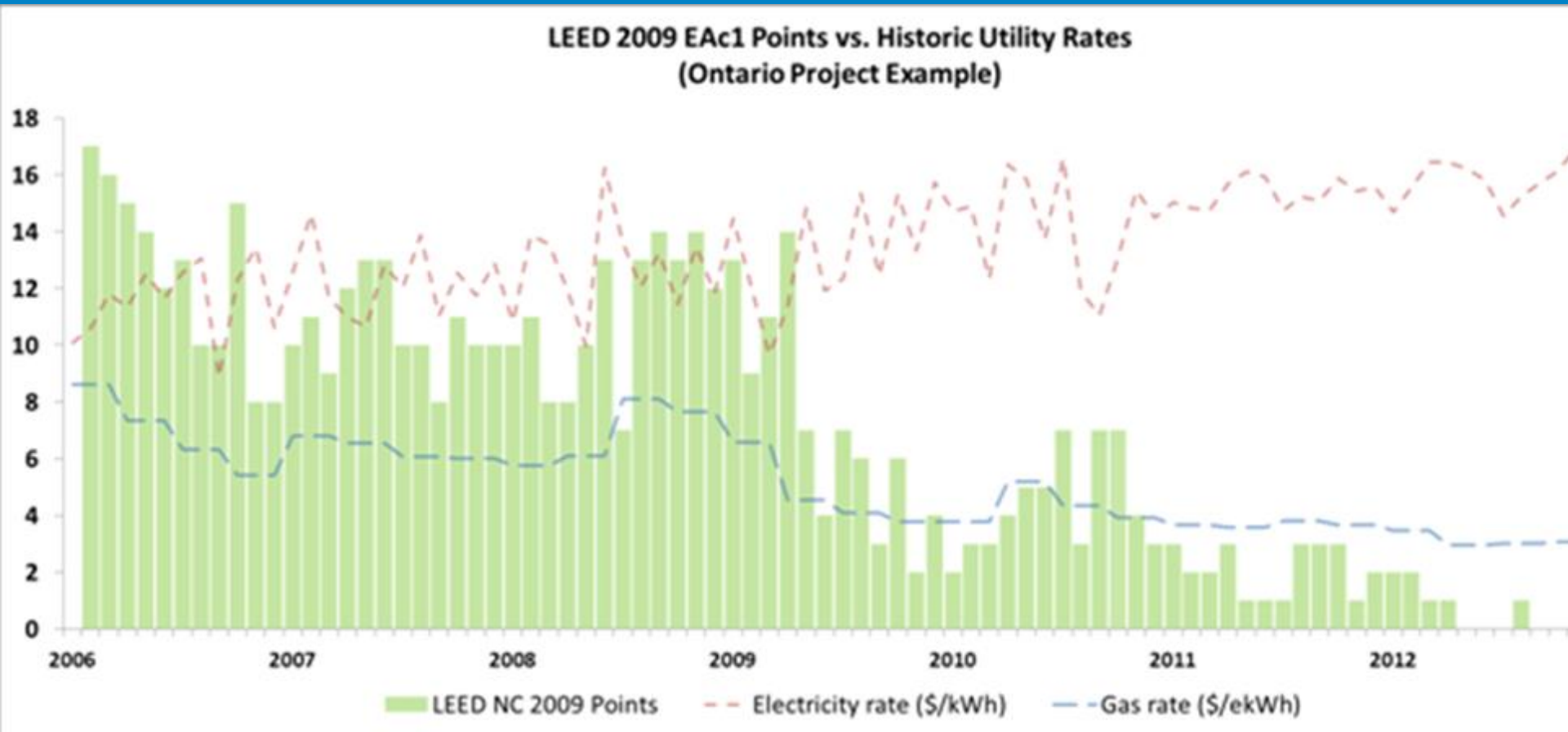
- Establish new systems at large, high density development sites
- Convert legacy steam systems (hospitals, universities, downtown) to renewable energy
- **LOAD DENSITY AND TIMING ARE KEY TO ECONOMICS**
- Franchise agreements to ensure renewable energy
- Connectivity requirements to secure loads



GREEN BUILDINGS: LEVERAGING INCREASED DENSITY

- Require LEED Gold rating with minimum 6 energy efficiency points
- Foster innovation and industry capacity for better than code development
- LEED has transformed North American building market, provides a third party verification, but as a policy tool for low-carbon buildings ...

1. LEED = Cost Efficiency NOT Use Efficiency



2. LEED has few credits for renewable energy

3. LEED cannot credit buildings that connect to a FUTURE renewable district energy systems



ALIGNING GREEN BUILDINGS WITH RENEWABLE DISTRICT ENERGY

- Establishing GHG intensity and thermal energy demand limits
- In-building solutions focus on passive design approaches (minimize demand; simplify building systems)
- Zero Emissions New Buildings: as energy use approaches Passive House standard, the paradigm shifts again

Final Thought...

**“We overestimate what we can achieve in one year
and underestimate what can be done in ten ...”**

1980s



2000s



Questions?

