

A scenic view of the Phoenix skyline at sunset. The city's skyscrapers are silhouetted against a vibrant orange and yellow sky. In the background, the rugged, reddish-brown peaks of the Phoenix Mountains are visible. The foreground shows a lush green golf course with winding paths and trees.

# City of Phoenix Transformative Policy

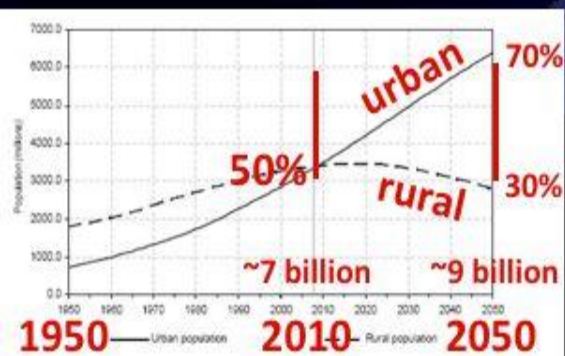
**Mark Hartman**  
Chief Sustainability Officer

# Where did everybody go ? . . . .



**MOST - settled in cities**

And within cities, since about 1950 . . .  
mostly 'at the edges'



global urbanization tipping point ~2010



# THE PATH TO A GREEN CITY

## A Large Network of Greenest Cities:

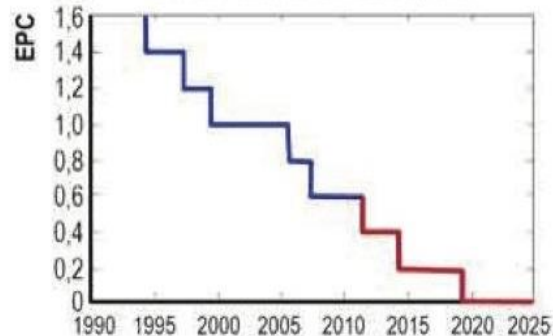
- New York
- San Francisco
- Portland
- Seattle
- Toronto
- Austin
- Boston
- Chicago
- Copenhagen
- Stockholm
- Oslo
- Madrid
- London
- Zurich
- Stuttgart
- Curitiba

130 USDN MEMBER CITIES

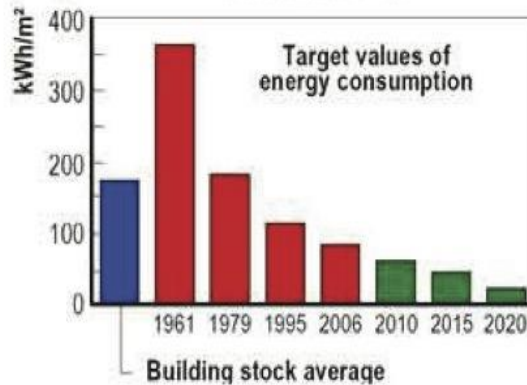


# European Energy Code Trends

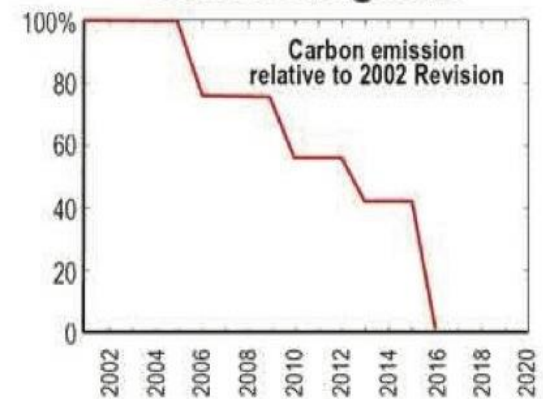
## The Netherlands



## Denmark

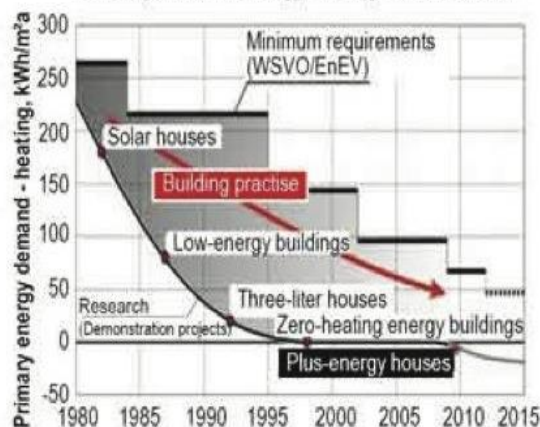


## United Kingdom

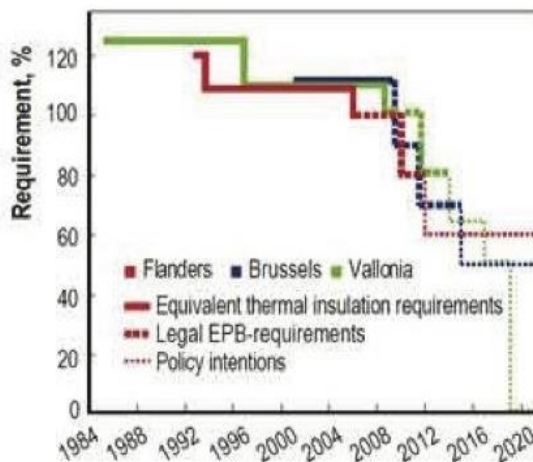


## Germany

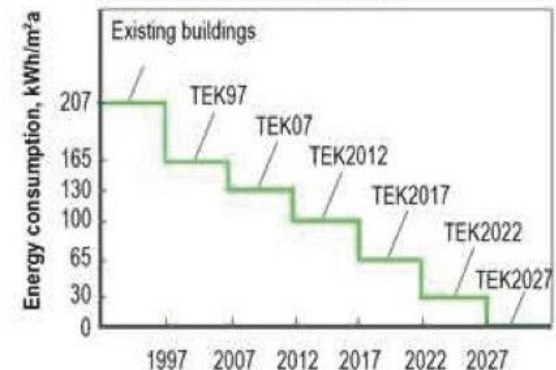
### Development of Energy-saving Construction

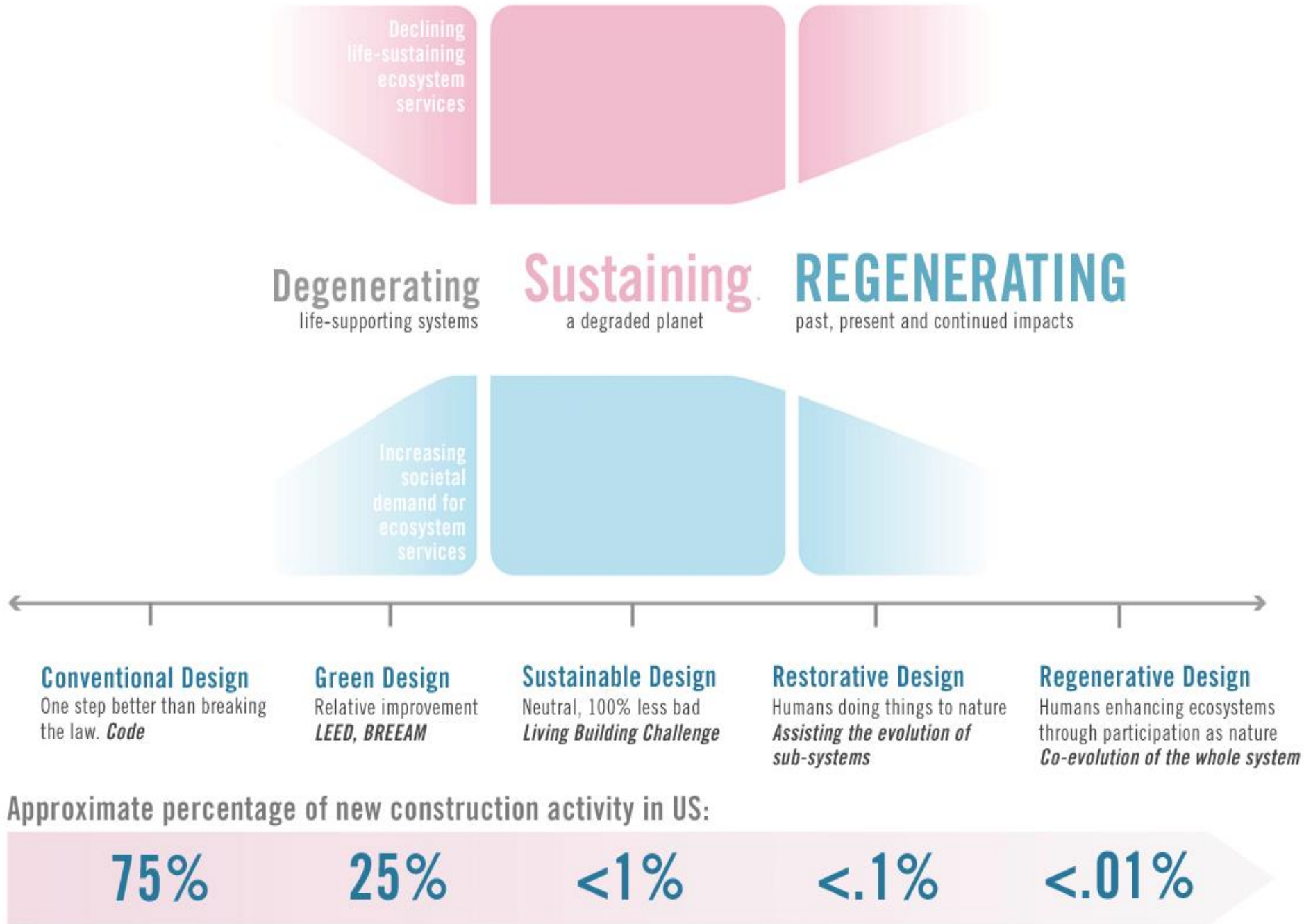


## Belgium



## Norway







# ***Public Realm***





***Beauty***



# Required Future State







# The Greenest City Action Team

Their task: Determine what Vancouver needs to do to become the greenest city in the world by 2020

# VANCOUVER 2020 A BRIGHT GREEN FUTURE

AN ACTION PLAN FOR BECOMING THE WORLD'S GREENEST CITY BY 2020

- Report created by GCAT, containing:
  - 10 broad long-term goals
  - 10 targets for 2020
  - Suggested action items
- 44 “Quick Start” actions to undertake in short term



VANCOUVER 2020 A BRIGHT GREEN FUTURE  
AN ACTION PLAN FOR BECOMING THE WORLD'S GREENEST CITY BY 2020





# Greenest City Process

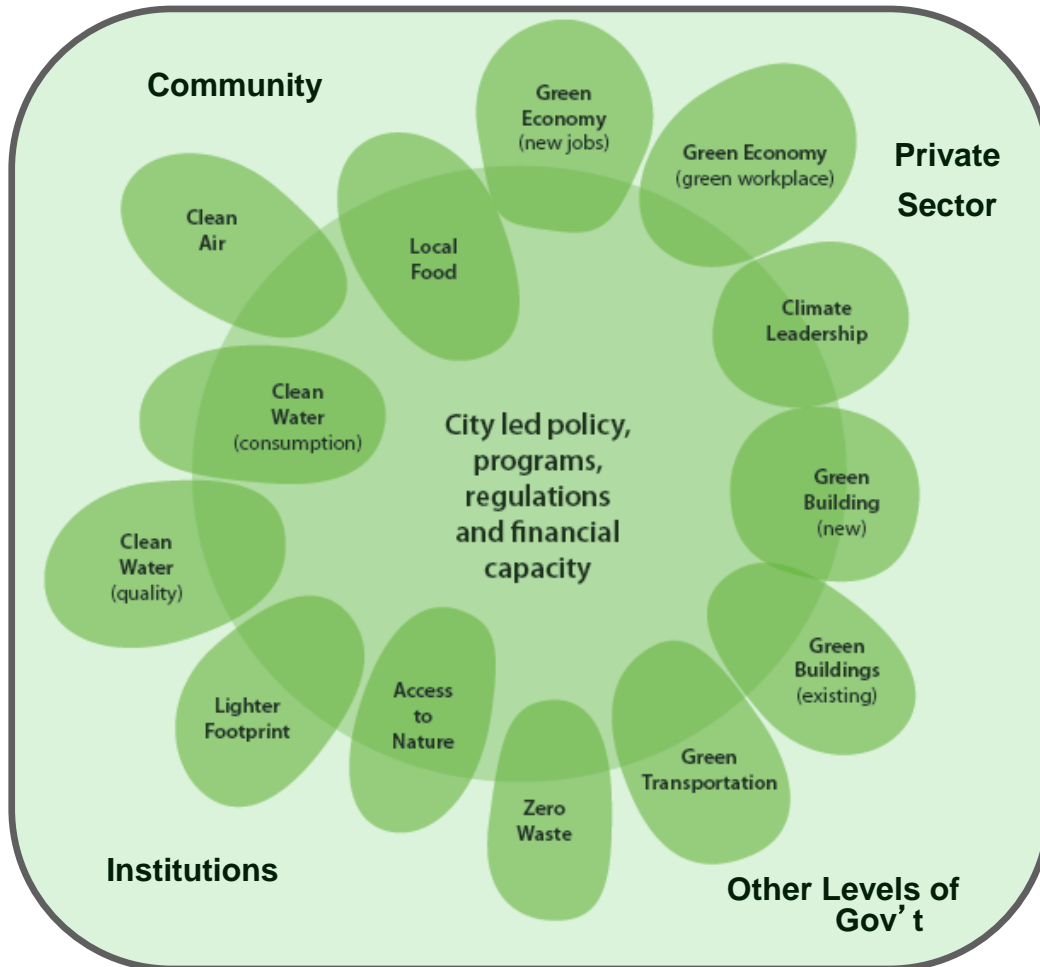








# City jurisdiction over Greenest City goals



The Greenest City goals cannot be achieved by City-led action alone



# ONE GREEN ECONOMY

**GOAL:** Secure Vancouver's international reputation as a mecca of green enterprise

**2020 targets:**

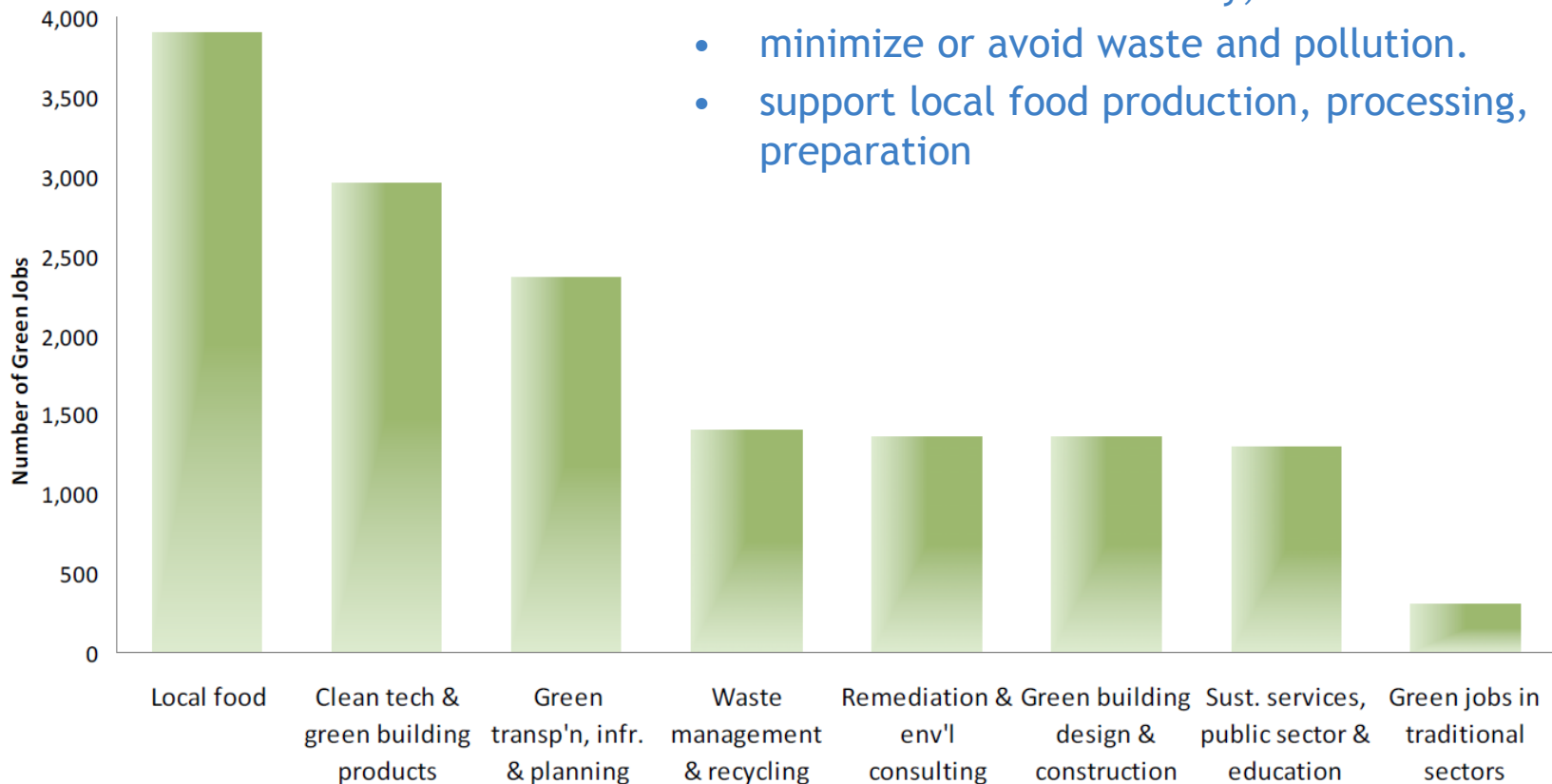
- 1) Double the number of green jobs in the City by 2020, over 2010 levels
- 2) Double the number of companies that are actively engaged in greening their operations over 2011 levels by 2020



# What is a “Green Job”?

Jobs that:

- contribute towards restoring or preserving environmental quality
- de-carbonize the economy;
- minimize or avoid waste and pollution.
- support local food production, processing, preparation



A photograph of two men standing in front of a large array of solar panels. The man on the left is wearing a grey suit and a blue tie, and is gesturing towards the panels with his right hand. The man on the right is wearing a light-colored shirt and glasses, and is looking at the panels. The solar panels are mounted on a metal structure and are tilted towards the sun. In the background, there are green trees and a clear sky.

## Green Technology Showcase Strategy

Invite new technology developers to showcase technology in Civic Facilities. Seeking funding opportunities with Sr. Gov'ts

Opportunities for private sector involvement?



Community-led initiatives helping to  
create green jobs:

# Green Social Enterprises





# TWO CLIMATE LEADERSHIP



**GOAL:** Eliminate Vancouver's dependence on fossil fuels

**2020 target:**  
Reduce community based greenhouse gas emissions 33 per cent from 2007 levels



# Landfill Gas Beneficial Use





# GOAL THREE

## GREEN BUILDINGS

**GOAL:** Lead the world in green building design and construction

**2020 targets:**

- 1) Require all buildings constructed from 2020 onward to be carbon neutral in operations.
- 2) Reduce energy use and greenhouse gas emissions in existing buildings by 20% over 2007 levels.





# FOUR GREEN TRANSPORTATION



**GOAL:** Make walking, cycling, and public transit preferred transportation options

**2020 targets:**

- 1) Make the majority of trips (over 50%) on foot, bicycle, and public transit
- 2) Reduce distance driven per resident by 20% from 2007 levels



# Dedicated Bike Lanes

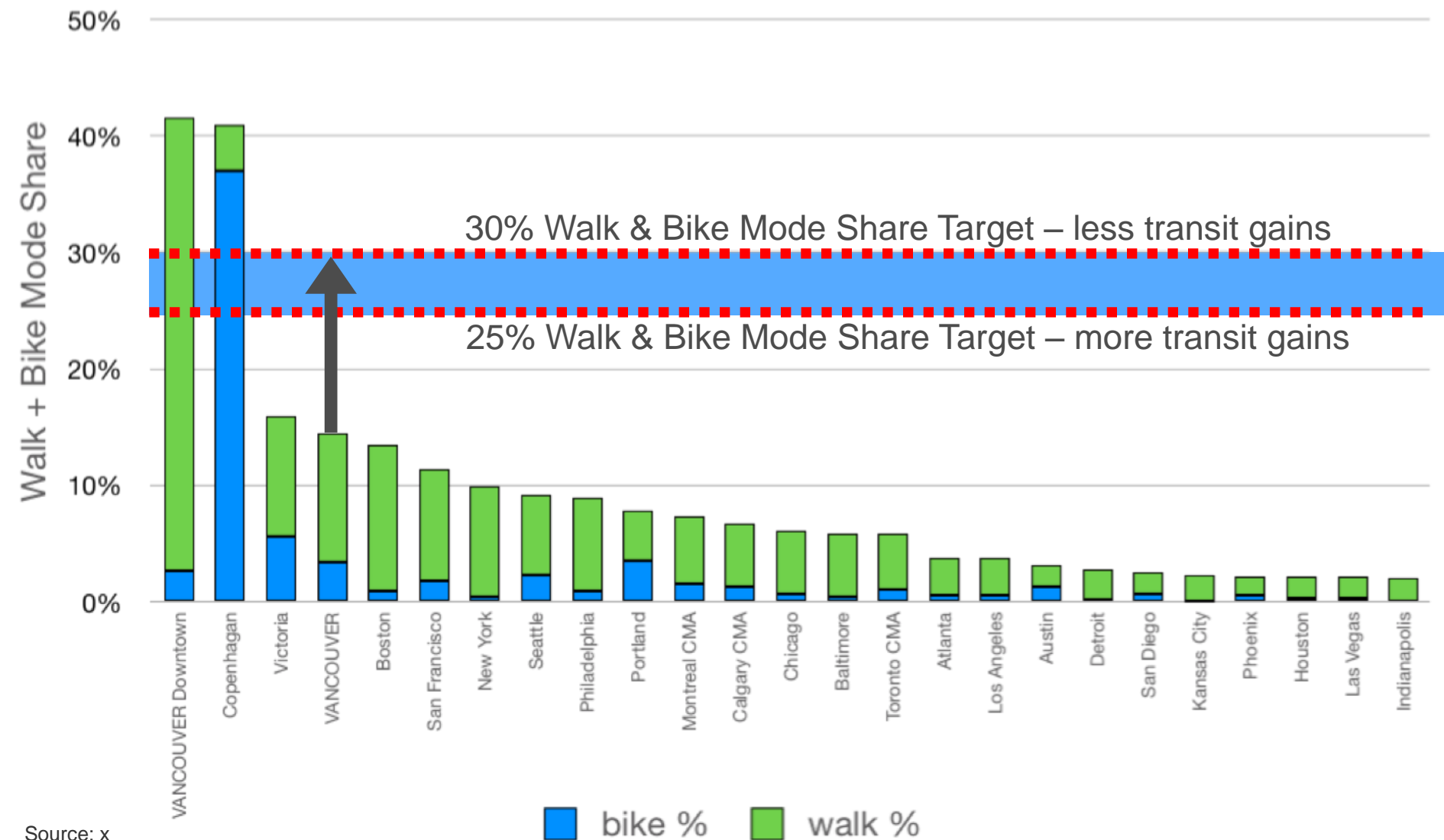


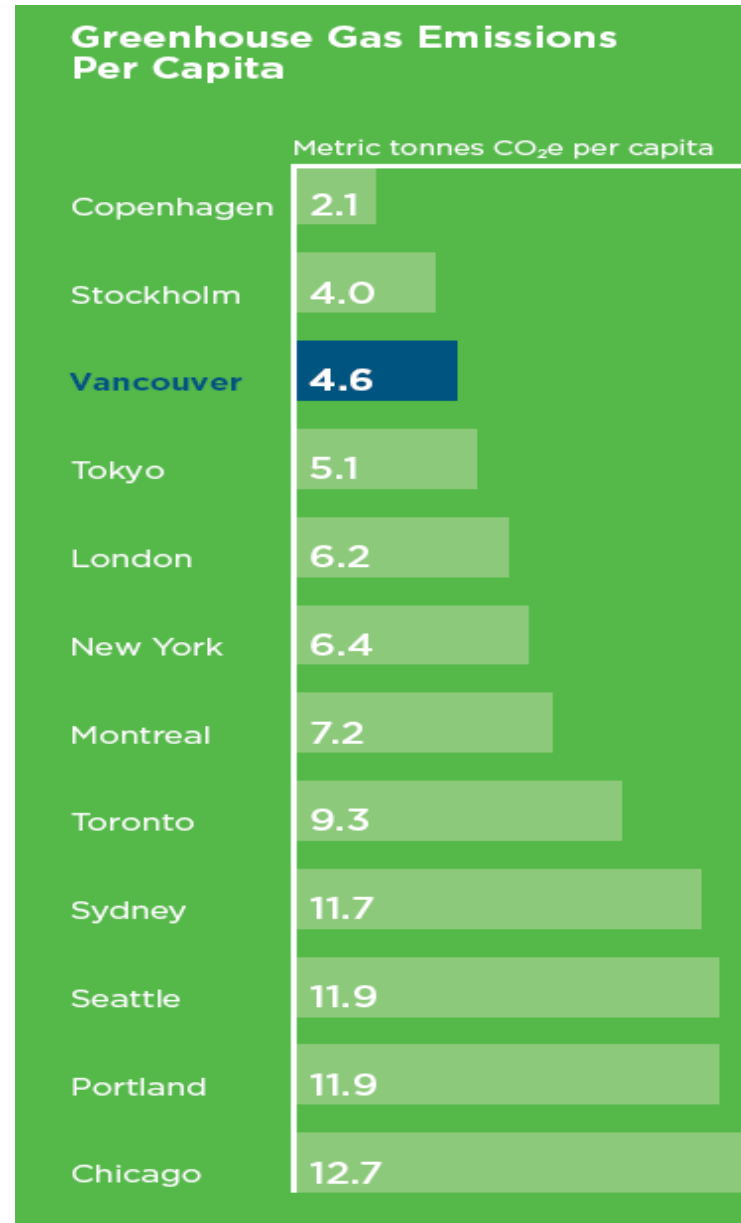
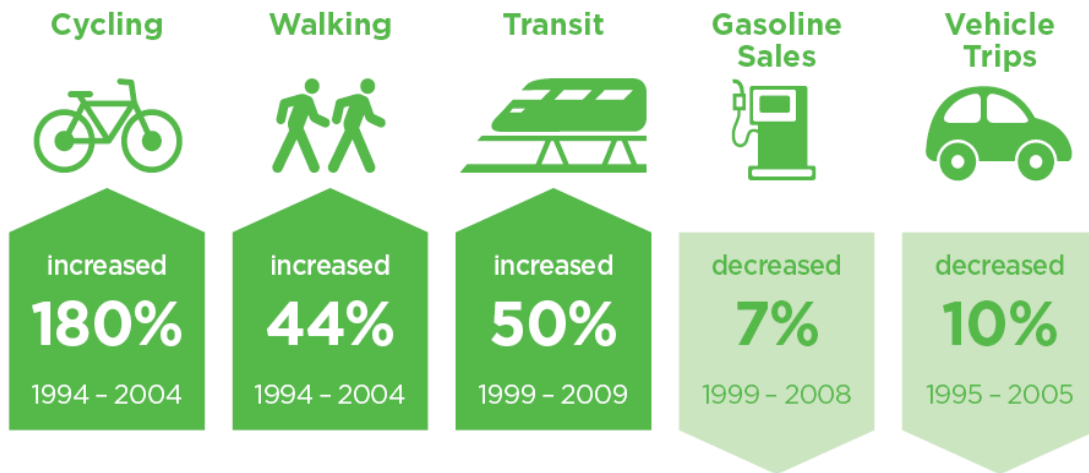


## Inventory & Targets

# 2020 Walk & Bike Mode Share Target

### Journey to Work Major Cities Comparison







# FIVE

# Zero Waste

HALF  
OF  
GARBAGE IS  
COMPOST

**GOAL: Create zero waste**

**2020 target:**

**Reduce total solid waste going to  
landfill or incinerator by 50% from  
2008 levels**





## City-led High Priority Actions:

1. Collect food scraps from single family homes
2. Pilot food scraps collection from multi-family and commercial properties
3. Work with the Province to expand take back (EPR) programs
4. Develop zero waste education and enforcement strategies
5. Develop a policy and incentives to encourage building deconstruction projects

*Implementation led by Waste Reduction and Recovery Management division*



# Food Scraps Diversion

## DON'T TRASH YOUR FOOD

TURN YOUR VALUABLE FOOD SCRAPS INTO COMPOST ♻️



You can add the following to your City of Vancouver yard trimmings cart:

• uncooked fruit & vegetable scraps • eggshells • tea bags, coffee grounds & filters

Continue to dispose of cooked foods, plastics and animal waste in your garbage or recycling

For more information about composting or the food scraps program, visit [vancouver.ca](http://vancouver.ca) or call 311



# **SIX** Access to Nature

**GOAL:** Provide incomparable access to green spaces

**2020 targets:**

- 1) Ensure that every Vancouver resident lives within a five- minute walk of a park, beach, greenway or other natural space**
- 2) Plant 150,000 additional trees in the city between 2010 and 2020**





## City-led High Priority Actions:

1. Build 4-6 mini-parks on City streets
2. Build new parks in priority neighbourhoods
3. Plant 15,000 new trees on City and other public property
4. Green Hastings Park

*Implementation led by Parks and the Streets division*



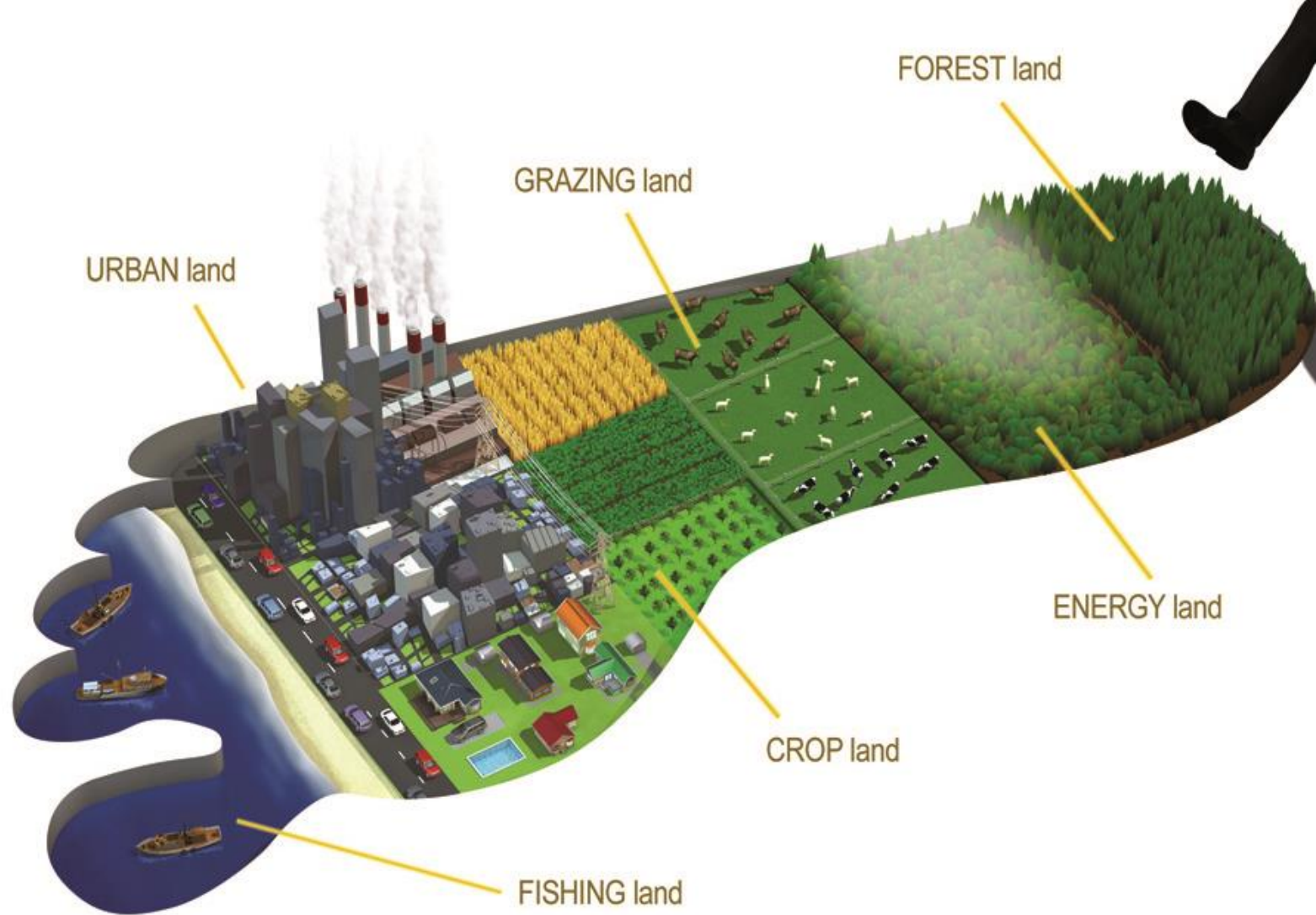
# SEVEN LIGHTER FOOTPRINT



**GOAL:** Achieve a one-planet ecological footprint

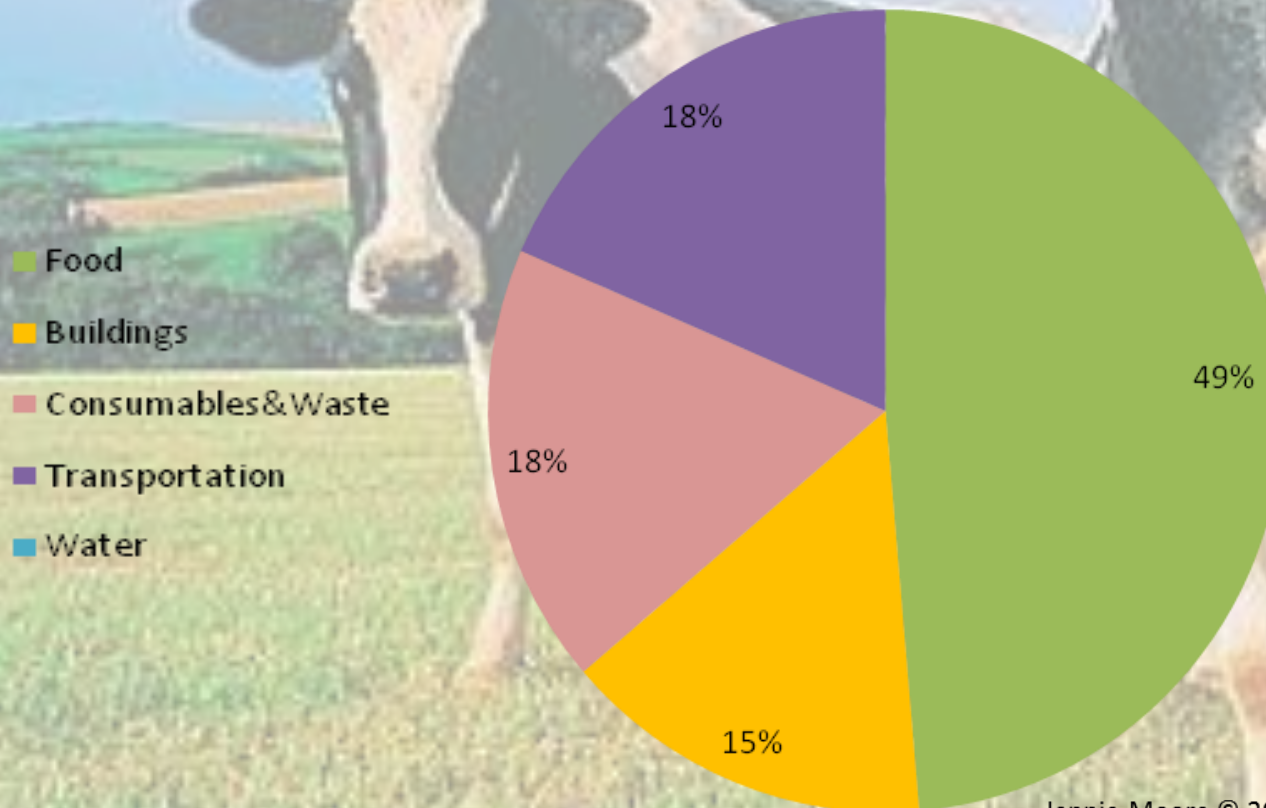
2020 target:  
Reduce Vancouver's per capita ecological footprint by 33% over 2006 levels





Ecological Footprint: The amount of land and water needed to produce the resources we consume and absorb our wastes in one year

**Ecological Footprint: The amount of land and water needed to produce the resources we consume and absorb our wastes in one year**



Jennie Moore © 2011



# EIGHT CLEAN WATER

**GOAL:** Enjoy the best drinking water of any major city in the world

**2020 targets:**

- 1) Meet or beat the strongest of BC, Canadian and international drinking water quality standards and guidelines
- 2) Reduce per capita water consumption by 33% over 2006 levels

# NINE CLEAN AIR

A background image showing a series of prayer flags (yellow, orange, and green) strung along a black metal pole against a clear blue sky. The flags are slightly out of focus, creating a sense of depth.

**GOAL:** Breathe the cleanest air of any major city in the world

**2020 target:**  
Meet or beat the most stringent of BC,  
Canadian and international air quality  
standards and guidelines



## City-led High Priority Actions:

1. Encourage electric vehicles
2. Regulate wood burning fireplaces
3. Establish a framework for new air quality planning at the City
4. Collaborate with the Port, BC Hydro and Metro Vancouver on joint air quality issues

*Implementation led by Sustainability*







# **TEN LOCAL FOOD**

**GOAL:** Become a global leader in  
urban food systems

**2020 target:**  
Increase city and neighbourhood  
food assets by a minimum of 50%  
over 2010 levels





## City-led High Priority Actions:

1. Support urban agriculture by creating: ~15 new community gardens, ~3 new urban farms, 2 new farmers markets, planting fruit trees and developing a food hub
2. Provide local food in City facilities
3. Develop a Vancouver Food Strategy

*Implementation led by Social Policy*



# GOAL THREE

## GREEN BUILDINGS

**GOAL:** Lead the world in green building design and construction

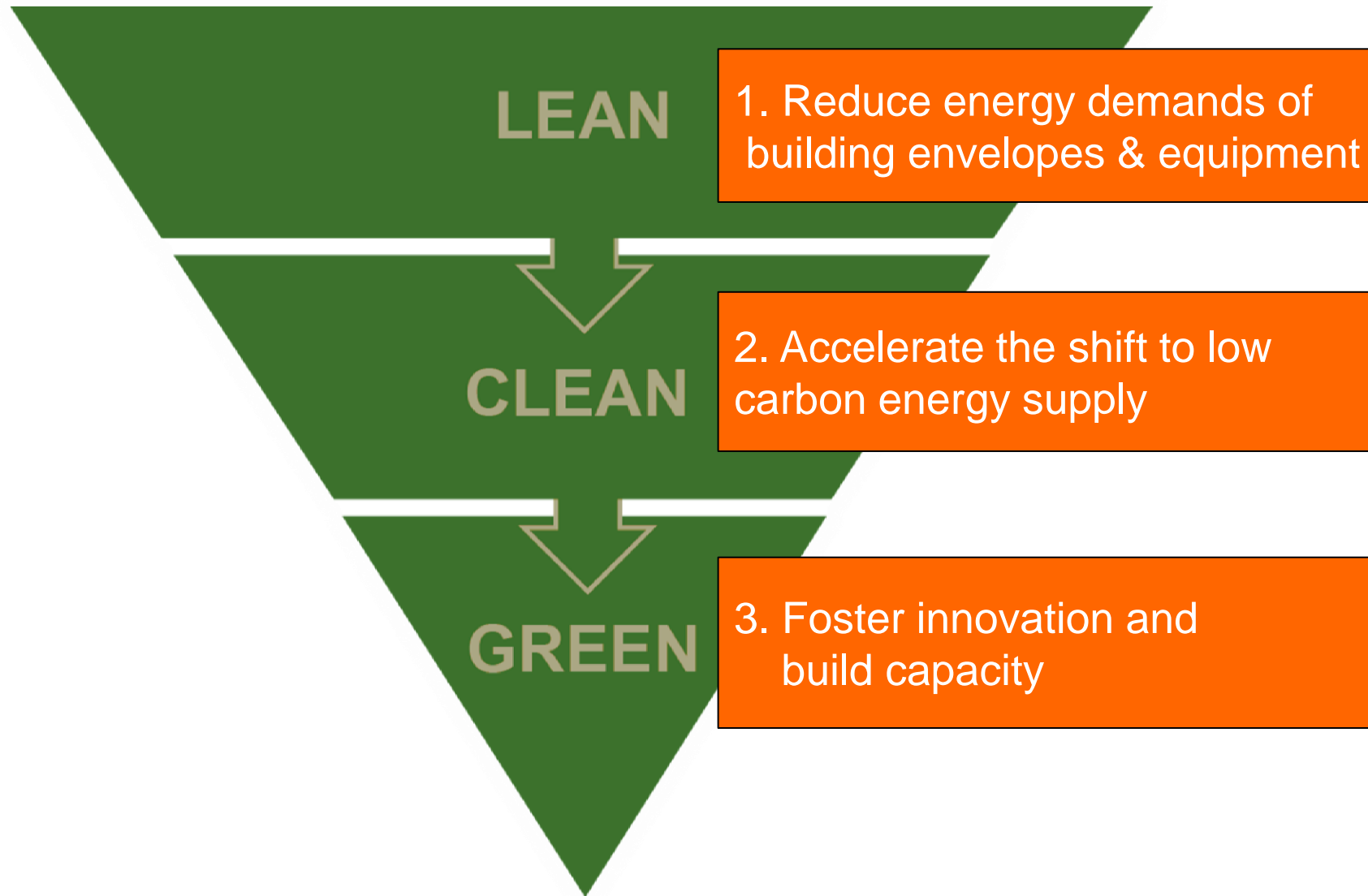
**2020 targets:**

- 1) Require all buildings constructed from 2020 onward to be carbon neutral in operations.
- 2) Reduce energy use and greenhouse gas emissions in existing buildings by 20% over 2007 levels.

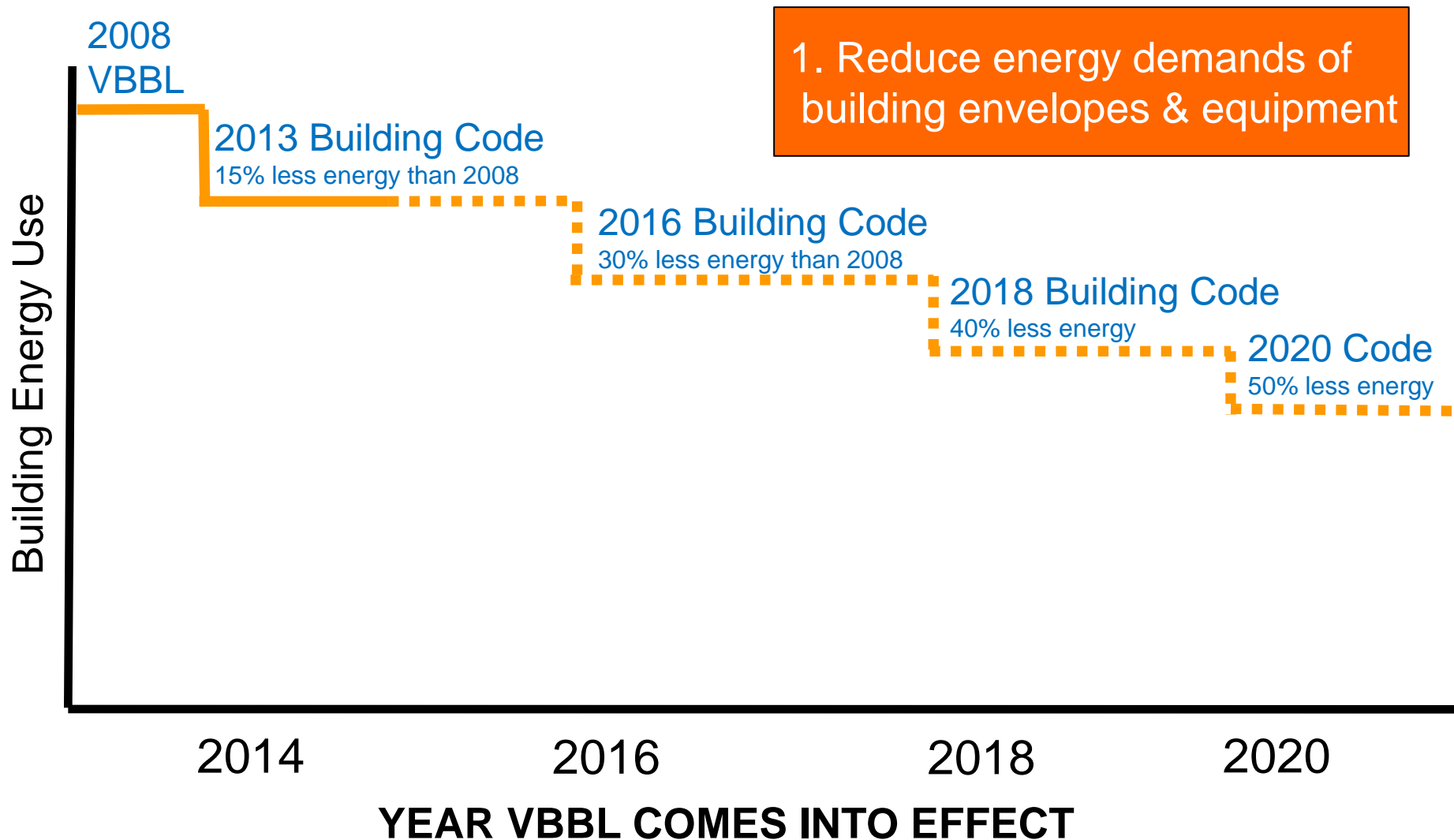




# Context: Reducing energy use and carbon in new buildings



# 1. Stepwise improvements to code to reduce energy demand (5% improvement per year)



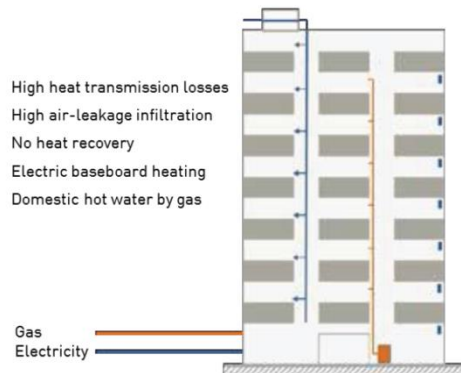


# Background: Current practice vs “carbon neutral”

## CURRENT PRACTICE 2013

Cost: **\$X**

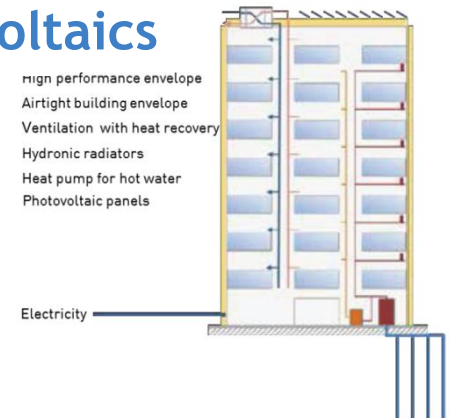
- High heat loss
- High air leakage
- No heat recovery
- Electric Baseboards
- Natural Gas hot water



## NEAR-CARBON NEUTRAL 2020

Cost\* = **\$X + 10.5%**

- High performance envelope
- Airtight envelope
- Ventilation heat recovery
- District energy heat/cool
- Heat Pump water heater
- Photovoltaics

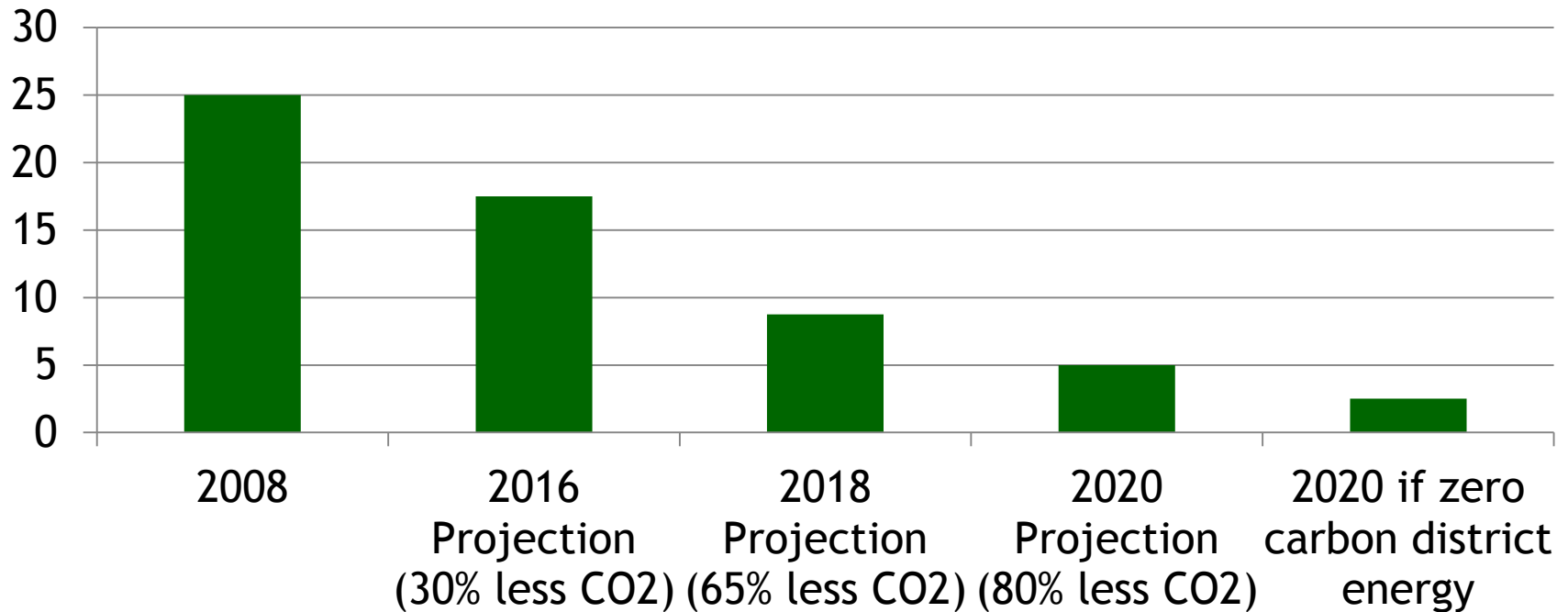


**\*10.5% incremental cost for High-Rise Residential**

**Source:** Intep: *Toward Carbon Neutral in B.C.* 2012 study

# Impact by 2020 of carbon neutral actions

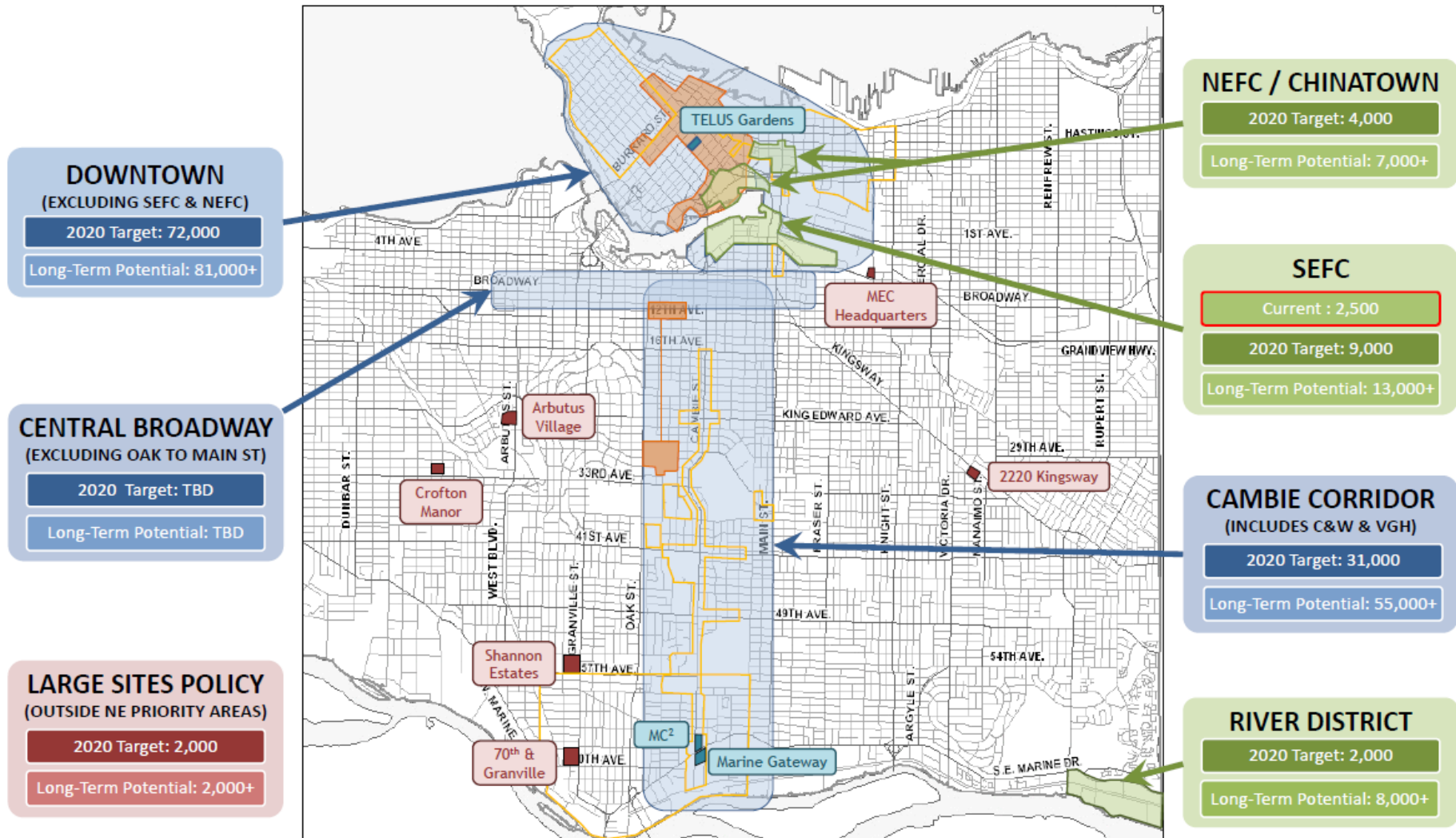
**Projected Residual Carbon Emissions  
from New Buildings**  
*KG of CO<sub>2</sub>e per m<sup>2</sup> per year*





# Require connection to low-carbon neighbourhood energy systems based on studies required by rezoning policy triggers

## 80-90% of large developments targeted for district energy



# ***LEED GOLD Rezoning Policy***

*Most recent 10 projects averaged 10 LEED 2009 Energy Points*



**46% increase in LEED developments  
in Vancouver since 2008.**



# ***Large Development Policy***

*All projects over 500,000 sq ft*





# *Higher Buildings Policy*

**Must Perform 50% better and show  
Architectural Excellence**



# *Net Zero Homes by 2020*





# EXISTING BUILDINGS



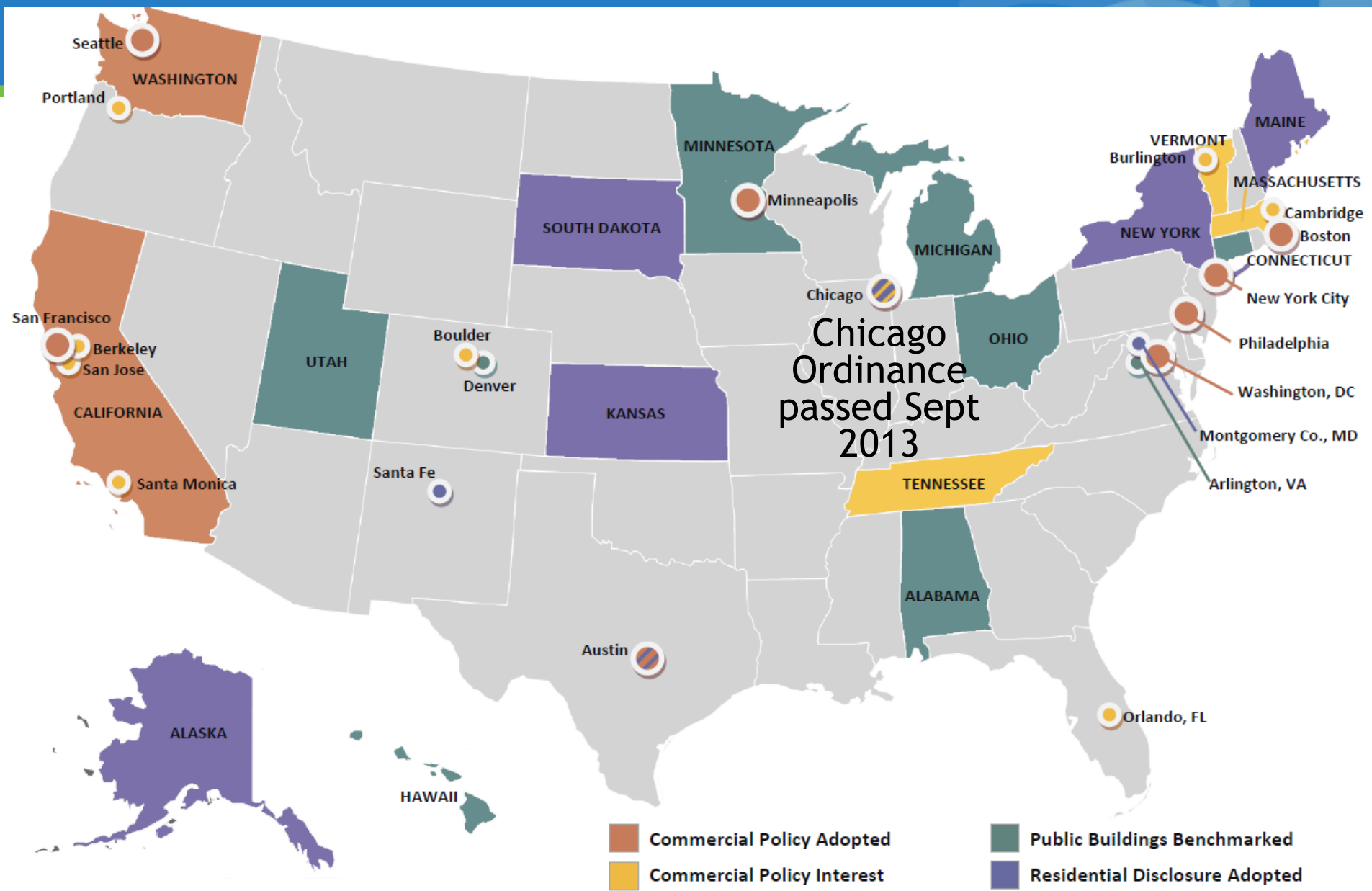


# Existing Buildings 2014

- Energy Audits
- 1&2 Family - modest prescriptive with Renovation Permit
- Other - Based on scale from minor upgrades to whole building audit & commissioning and energy upgrades

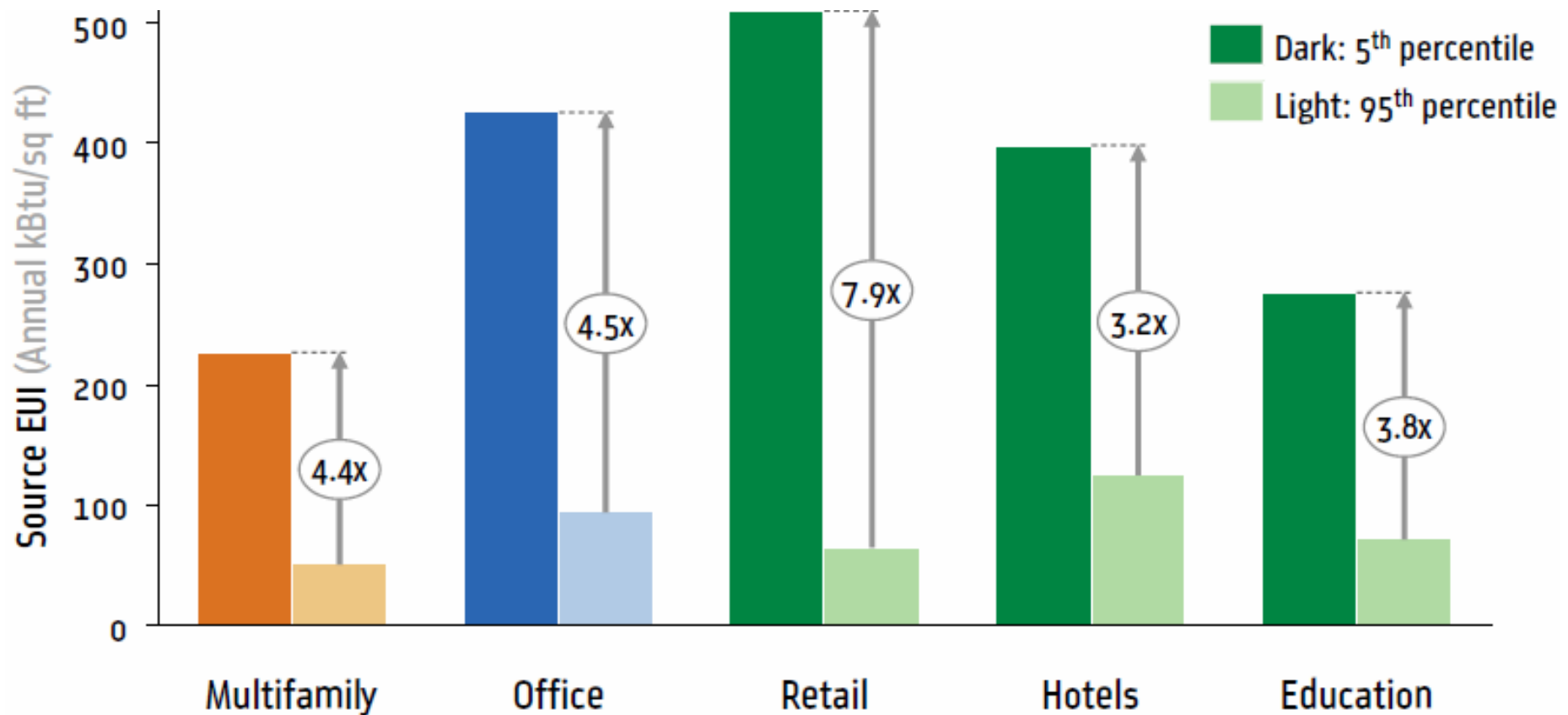


# U.S. Benchmarking Policy Landscape





# NYC 2012 Benchmark Report Main Results: variation in energy use



Note: Building age not a significant factor

Source: NYC Mayor's Office of Long-Term Planning and Sustainability

# Summary

- Policy Intent based on the long term
- Need goals to set direction
- Aggressive goals inspire innovation
- Follow Policy with Enforcement Strategy



# Phoenix Actions

- Bike Share
- Benchmarking
- Star Community
- Building Code
- Waste Diversion
- LED Streetlights
- Carrot Mobs



We over-estimate what can be done in 1 year but underestimate what can be done in 10.

**1980s**



**2000s**

