City of Phoenix
Transformative Policy

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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

Belgium

Norway
Degenerating: life-supporting systems

Sustaining: a degraded planet

Regenerating: past, present and continued impacts

Increasing societal demand for ecosystem services

Conventional Design: One step better than breaking the law. *Code*

Green Design: Relative improvement *LEED, BREEAM*

Sustainable Design: Neutral, 100% less bad *Living Building Challenge*

Restorative Design: Humans doing things to nature *Assisting the evolution of sub-systems*

Regenerative Design: Humans enhancing ecosystems through participation as nature *Co-evolution of the whole system*

Approximate percentage of new construction activity in US:

- 75%
- 25%
- <1%
- <.1%
- <.01%

Public Realm
Beauty
Required Future State

- Zero Carbon
- Zero Waste
- Healthy Ecosystems
The Greenest City Action Team

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

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.
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
2020 Walk & Bike Mode Share Target
Journey to Work Major Cities Comparison

Inventory & Targets

30% Walk & Bike Mode Share Target – less transit gains
25% Walk & Bike Mode Share Target – more transit gains

Source: x
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 or call 311.
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*
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.
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
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
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. Reduce energy demands of building envelopes & equipment
2. Accelerate the shift to low carbon energy supply
3. Foster innovation and build capacity
1. Stepwise improvements to code to reduce energy demand (5% improvement per year)

2008 VBBL

- 2013 Building Code: 15% less energy than 2008
- 2016 Building Code: 30% less energy than 2008
- 2018 Building Code: 40% less energy
- 2020 Code: 50% less energy

1. Reduce energy demands of building envelopes & equipment
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 CO2e per m² per year*

- **2008 Projection (30% less CO2)**: 25 KG
- **2016 Projection (65% less CO2)**: 15 KG
- **2018 Projection (80% less CO2)**: 10 KG
- **2020 Projection**: 5 KG
- **2020 if zero carbon district energy**: 2 KG
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
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.