



CLINTON
CLIMATE
INITIATIVE

A GREEN CITIES AGENDA

Green Buildings and Greenhouse Gas Mitigation



Rob Bennett, Clinton Climate Initiative



A GREEN BUILDING STRATEGY FOR CITIES

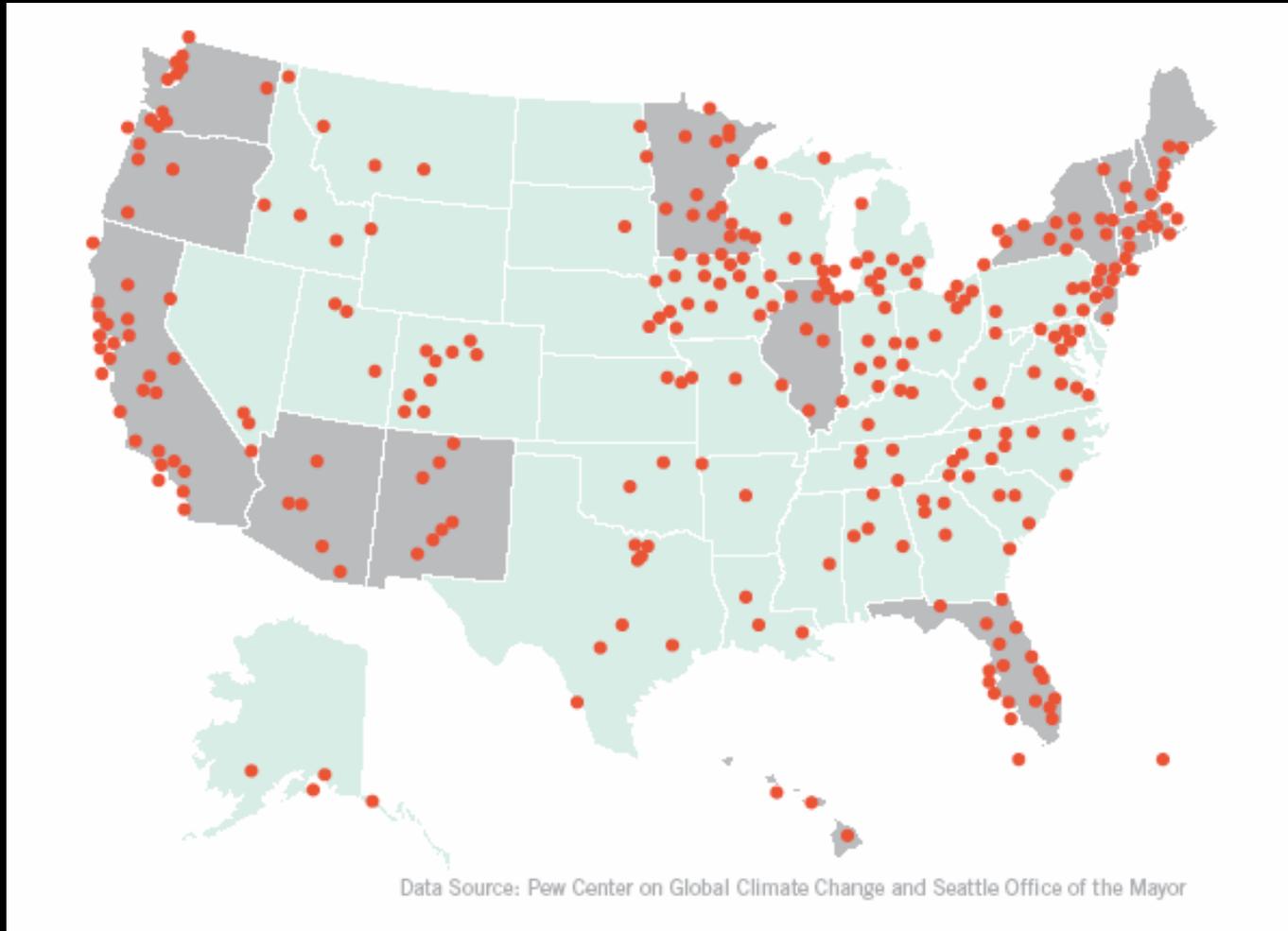
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CLIMATE INITIATIVES

- Kyoto Protocol
- US Mayor's Climate Protection Agreement
- California AB 32
- Western Region Climate Action Initiative
- Regional Greenhouse Gas Initiative (RGGI)
- California Climate Action Registry / Climate Registry
- 2030 Challenge: Adopted by US Conference of Mayors, USGBC and AIA
- US Climate Action Partnership
- The American College & University Presidents Climate Commitment
- BOMA's Energy Challenge

The Backdrop

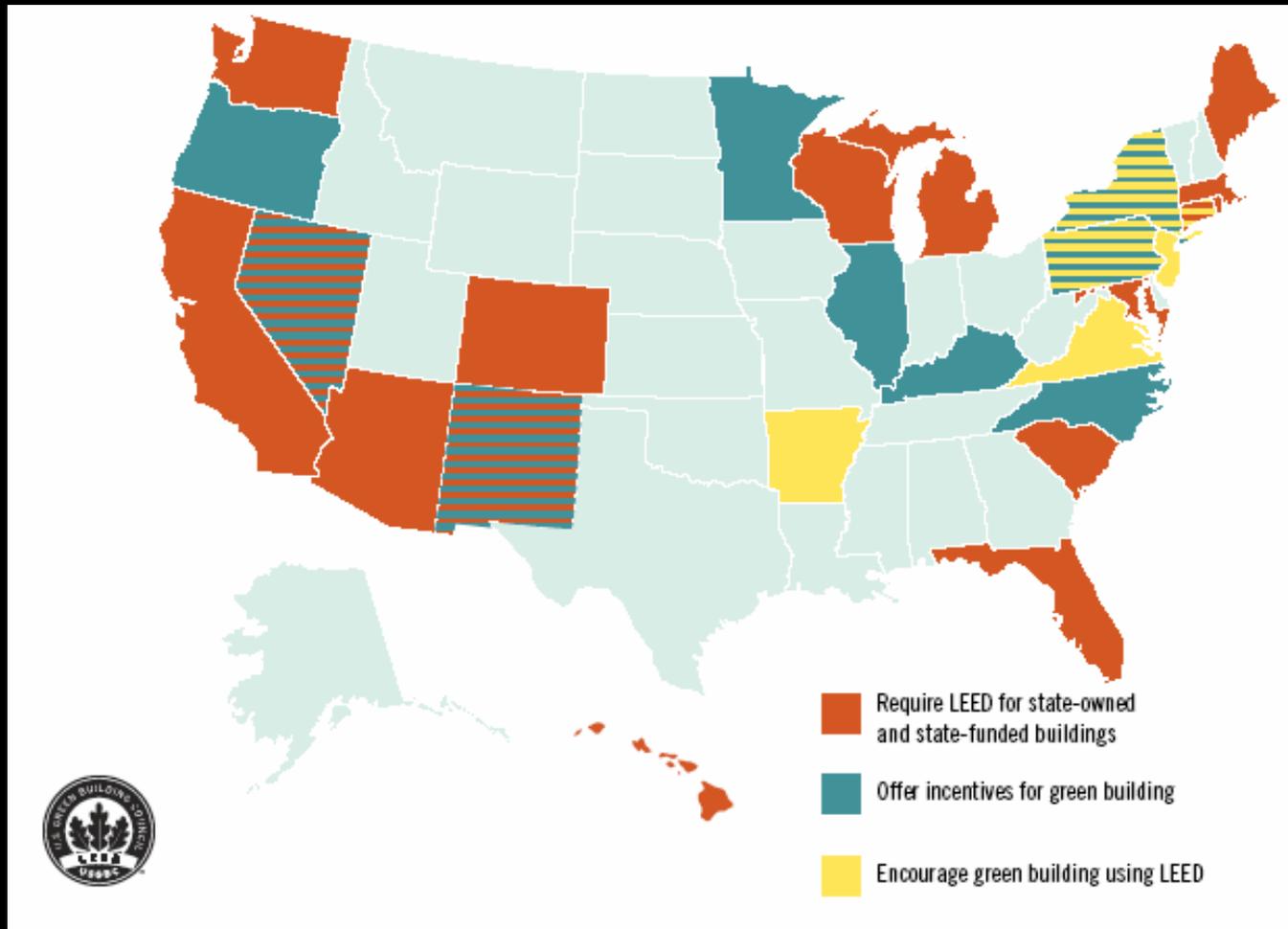
U.S. LOCAL AND STATE EMISSION REDUCTION STRATEGIES



Source: Pew Center on Global Climate Change

The Backdrop

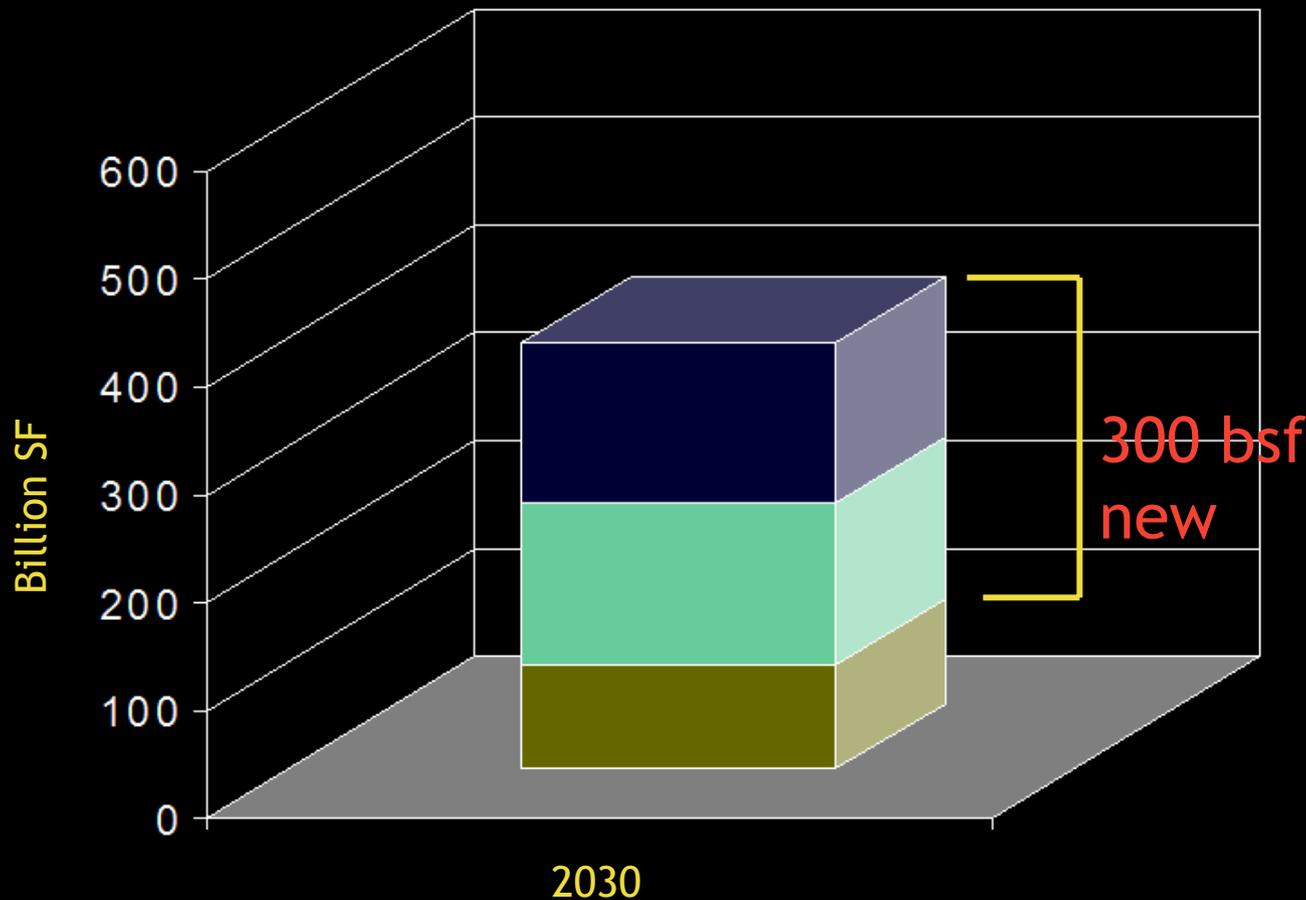
U.S. GREEN BUILDING POLICY INITIATIVES



Source: US Green Building Council

The Backdrop

BUILDING CONVERSION OVER TIME



Source: Architecture 2030

Annual Construction



Demolition: 1.75 bsf



Retrofit: 5 bsf

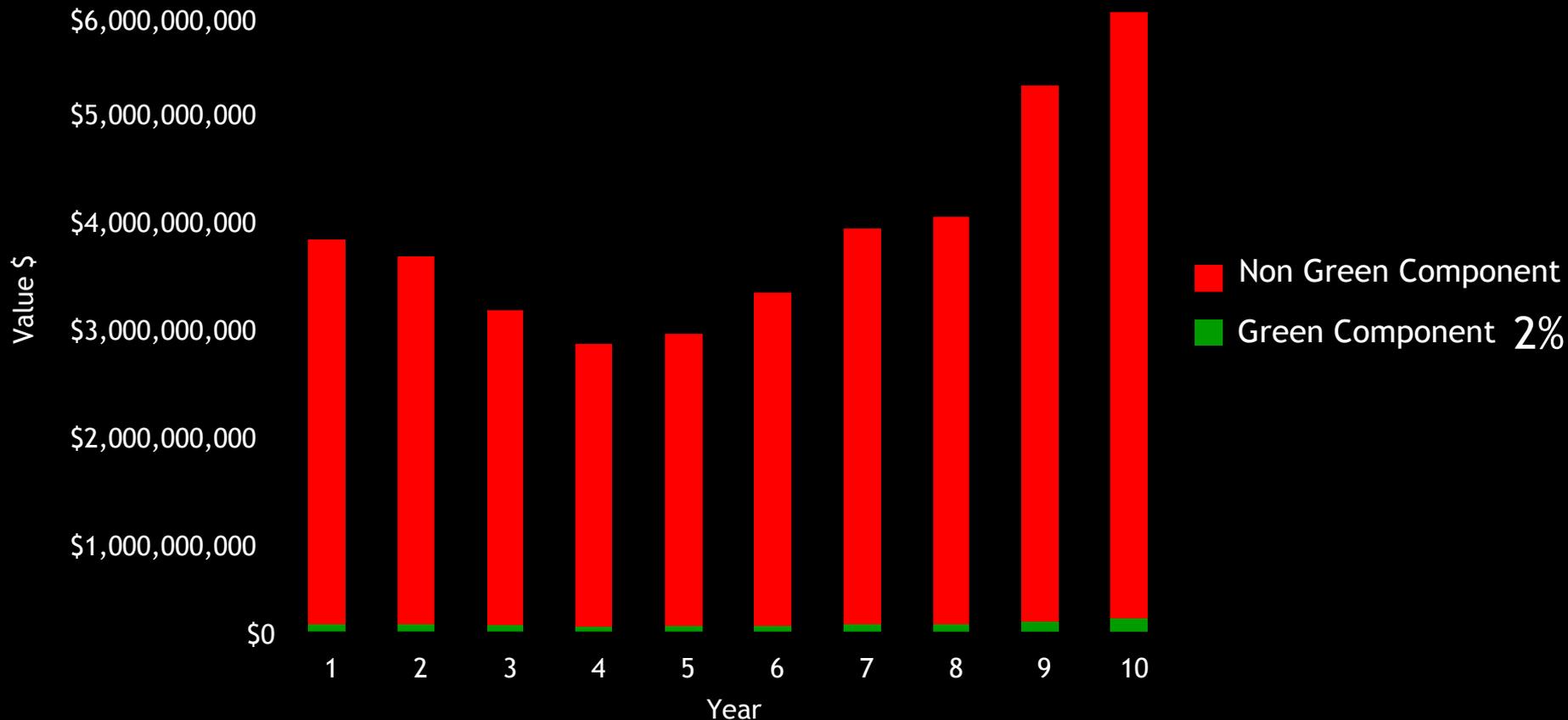


New: 5 bsf

The Regional Landscape

VANCOUVER'S BUILDING INDUSTRY PROFILE

GVRD Building Permit Values 1996-2005



Green Building estimates range from 2-4% = \$114 - \$228 M in 2005

Source: Sustainable Building Centre, 2006

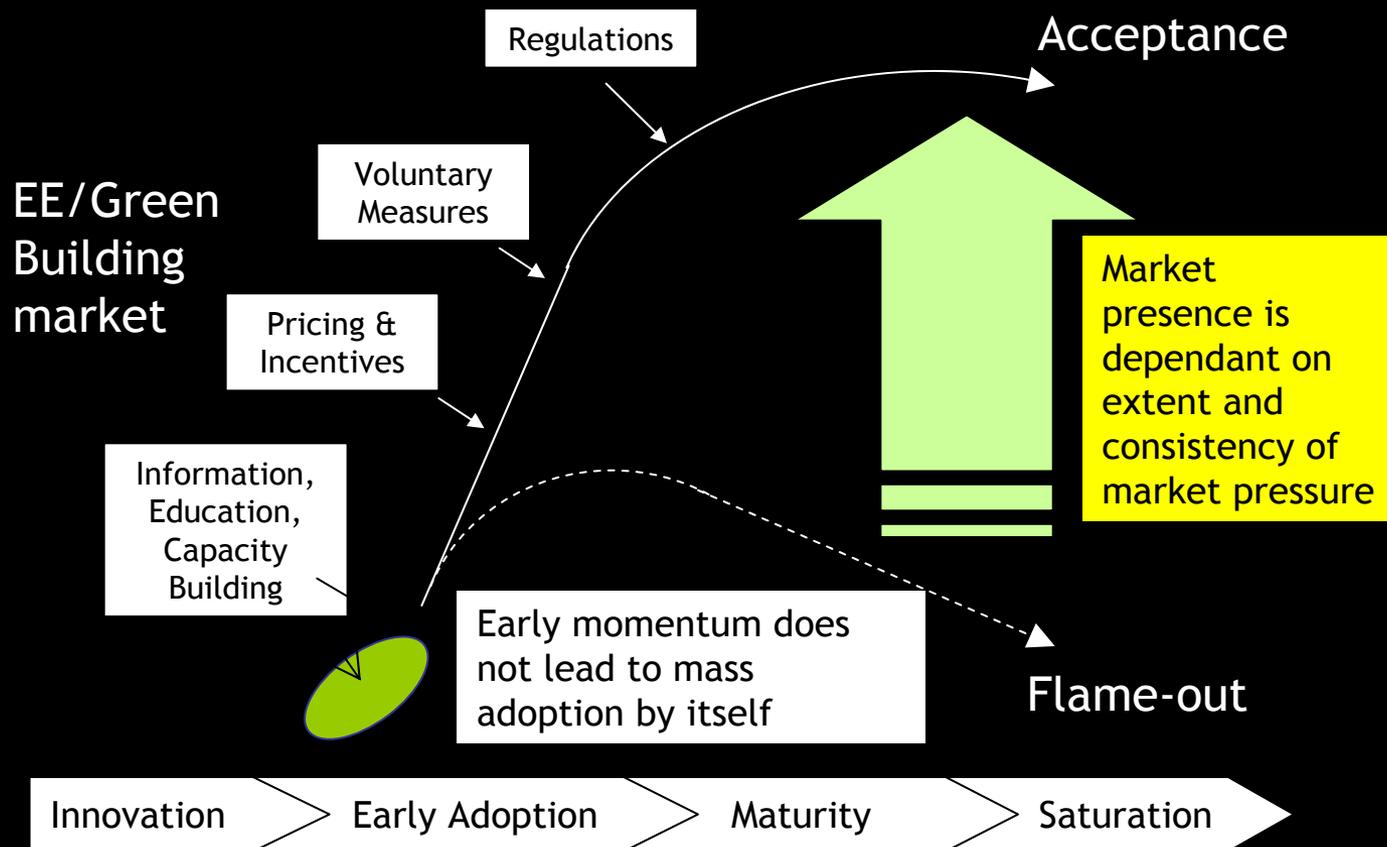
Mapping a Climate Strategy

US CONFERENCE OF MAYORS SURVEY

- 9 out of 10 cities anticipated requiring in the next year that new city buildings be energy efficient, healthy and environmentally sustainable.
- 87% of cities require, or anticipate requiring in the next year, that city government buildings undergoing major rehabilitation be energy efficient, healthy and environmentally sustainable.
- 56% have a policy in place
- 31% anticipate they will adopt such a policy in the next year
- 3 in 4 cities have changed, or are in the process of changing building codes with emphasis on energy efficiency and sustainability
- 2 in 3 cities have change, or are in the process of changing, their building codes to encourage that buildings undergoing major rehabilitation be energy efficient and green
- 78% of cities are undertaking efforts to encourage green building in the private sector
- 88% of cities are undertaking efforts to educate the public about the importance of green buildings

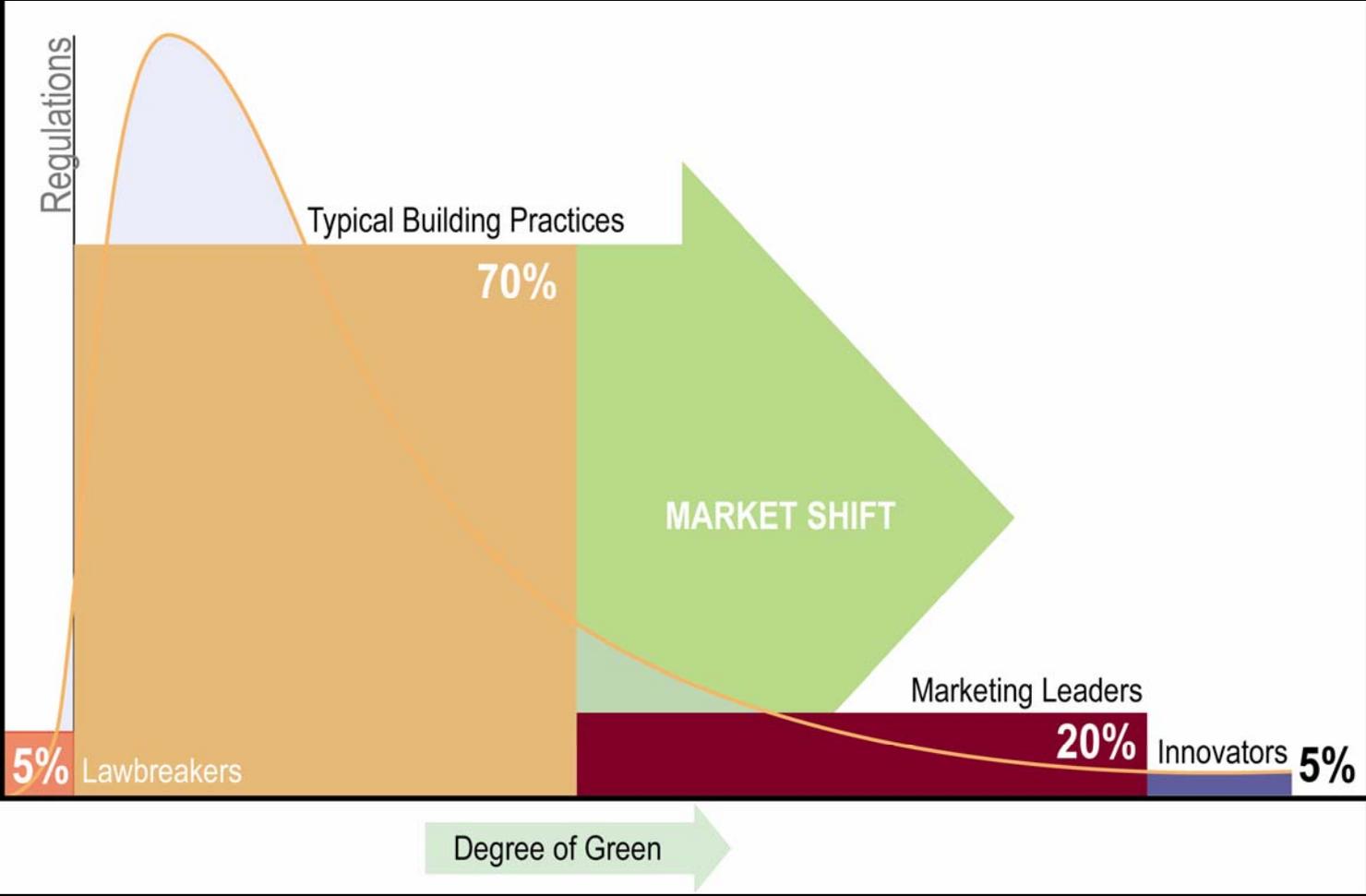
Mapping a Climate Strategy

CREATE A MARKET PENETRATION CURVE



Mapping a Climate Strategy

REGULATIONS & MARKET SHIFT

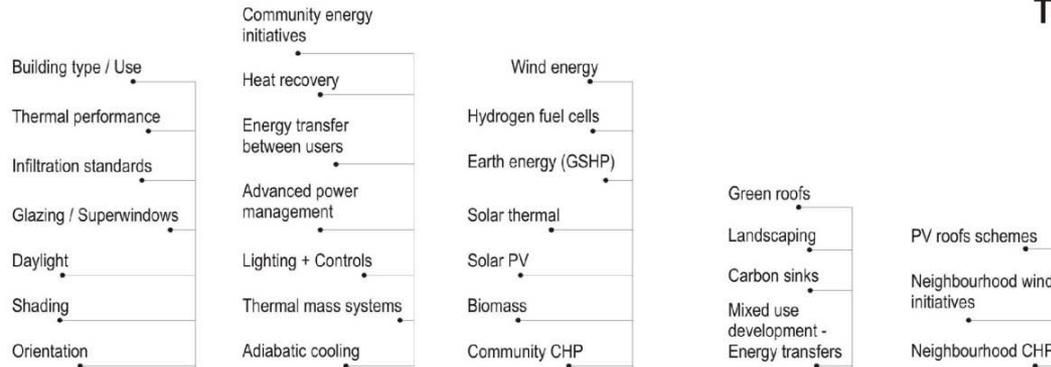


Mapping a Climate Strategy

A ROADMAP TO CARBON NEUTRAL

UKGBC ROADMAP #1 TOWARDS CARBON ZERO

MEASURES



INSTRUMENTS

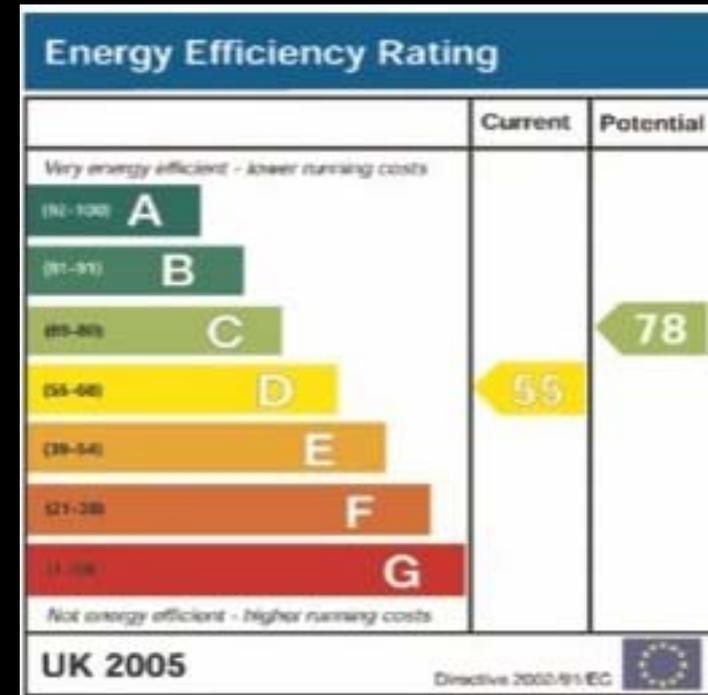


Mapping a Climate Strategy

MUNICIPAL BUILDINGS POLICIES

Regulations

- Audit Program: Victoria EPA, EU
- On Site Renewables: Merton, London
- Energy Efficiency Requirements: Austin, Berkeley, San Francisco Time of Sale
- Product Requirements: Incandescent Lighting Ban - Australia
- Local Carbon Tax: Boulder, CO
- 3rd Party Green Building Requirements: Boston, New York, DC, Portland, San Francisco
- Building Codes: Austin, Vancouver BC



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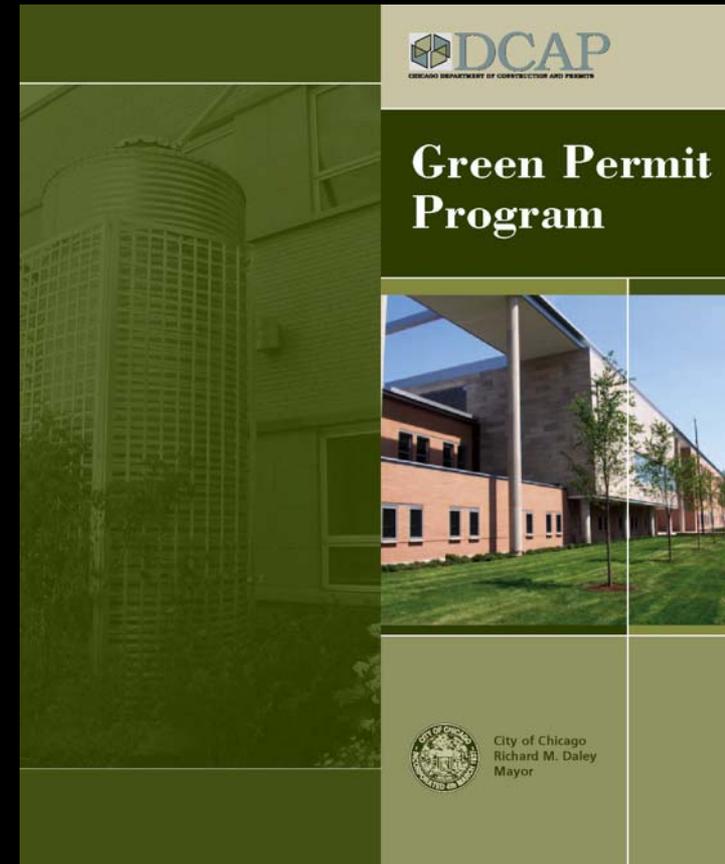
MUNICIPAL BUILDINGS POLICIES

Financial Incentives

- On Bill Financing: Nova Scotia Power, San Diego Gas and Electric
- Tax Credits: State of NY, Oregon, etc.
- Utility Rebates & Loans: Toronto Atmospheric Fund Revolving Loan Funds
- Fee Waivers: City of Calgary, Pasadena

Non-Financial Incentives

- Expedited Permitting: City of Chicago
- Energy Efficiency Density Bonuses: Minneapolis
- Green Building Density Bonus: Seattle, Arlington County, Nashville



Mapping a Climate Strategy

COMPREHENSIVE INITIATIVES: PLANYC

The Plan for 2030

During his Earth Day address, Mayor Michael R. Bloomberg released a plan for a "greener, greater New York," with 127 proposals covering six areas. Examples large and small include:

LAND

- Rezone in neighborhoods near public transportation to create 265,000 new homes.
- Ensure that residents live within a 10-minute walk to a park by opening schoolyards as playgrounds and reclaiming sites that were once designated as parks.
- Accelerate the cleanup of 7,600 acres of contaminated sites.

WATER

- Provide incentives to building owners to recycle water for non-potable uses like flushing the toilet.
- Develop 40 "Greenstreets" projects every planting season over 25 years to expand storm water storage.
- Increase the city's trees by one million.

AIR QUALITY

- Require the use of higher grades of fuel oil to heat businesses, schools and homes.
- Waive the city sales tax on hybrid vehicles.

Source: office of the mayor

TRANSPORTATION

- Reach a "state of good repair" on the city's roads, subways and railways.
- Create a bus rapid transit program with super express buses that would run in dedicated lanes.
- Run a pilot program that charges commuters to drive into Manhattan on weekdays, and use these "congestion pricing" funds for transit projects.

ENERGY

- Provide cleaner, more reliable power by upgrading the energy infrastructure and retiring dirty power plants.
- Reduce energy use by encouraging the largest consumers to increase energy efficiency.
- Add a surcharge to electric bills to finance incentives for retrofitting buildings.

CLIMATE CHANGE

- Reduce greenhouse gas emissions by 30 percent.
- Develop citywide and community plans for adapting to the consequences of climate shifts, including rising seas and intensifying storms.

The New York Times





THE CLINTON CLIMATE INITIATIVE

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C40 PARTNERSHIP

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

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STIMULATING MARKETS & PROMOTING EFFICIENCY

- C40 Partnership
 - Purchasing Consortium
 - Domains: Buildings, Waste, Water, Transport
 - Best Practices & Technical Assistance
 - Emissions Tool: Microsoft & ICLEI
- Business Partnerships
- Biosequestration
- New Energy
 - Clean Coal



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PURCHASING CONSORTIUM

Lighting:

- LED Traffic Lights
- Energy-Efficient Outdoor, Commercial and Residential Lighting Products

Building Envelopes:

- Solar-control Window Films
- Cool Roofing (elastomeric coatings and single-ply membranes)

Building Systems

- Commercial Building Cooling and Control Systems

Municipal Fleets

- CNG-Based Vehicle Propulsion Systems
- Diesel Hybrid Propulsion Systems
- Fuel-Cell Propulsion Systems

Water and Waste Systems

- Solid Waste Methane Capture Systems
- Potable Water Pump Systems

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TECHNICAL PARTNERS

- International Council for Local Environmental Initiatives (ICLEI)
- United States Green Building Council (USGBC)
- Earth Day Network
- Institute for Transportation and Development Policy (ITDP)
- Alliance to Save Energy
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- Lawrence Berkeley National Laboratory (LBNL)
- Enterprise Community Partners
- World Green Building Council

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A BUILDINGS STRATEGY

Goal

- Scaling best practices from around the globe to radically improve building performance

Program Elements

- Energy Efficiency Building Retrofit Program
- Green Codes
- Affordable Housing: partnership with Enterprise's Green Communities program
- Housing Strategy: to be determined

The Backdrop

OPPORTUNITIES FOR GHG SAVINGS IN BUILDINGS

- IPCC: By 2020 there is a global potential to reduce projected emissions from buildings by 30% - more with a price for carbon.
- UNEP: By 2010 Europe could cut 20% of present buildings energy consumption.
- EPA: 10% energy reduction in all building types by 2015 in the US would lead to:
 - Greenhouse gas reductions equivalent to 15 million automobiles
 - A savings of 10 billion dollars in building energy bills

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BUILDING RETROFIT PROGRAM OVERVIEW

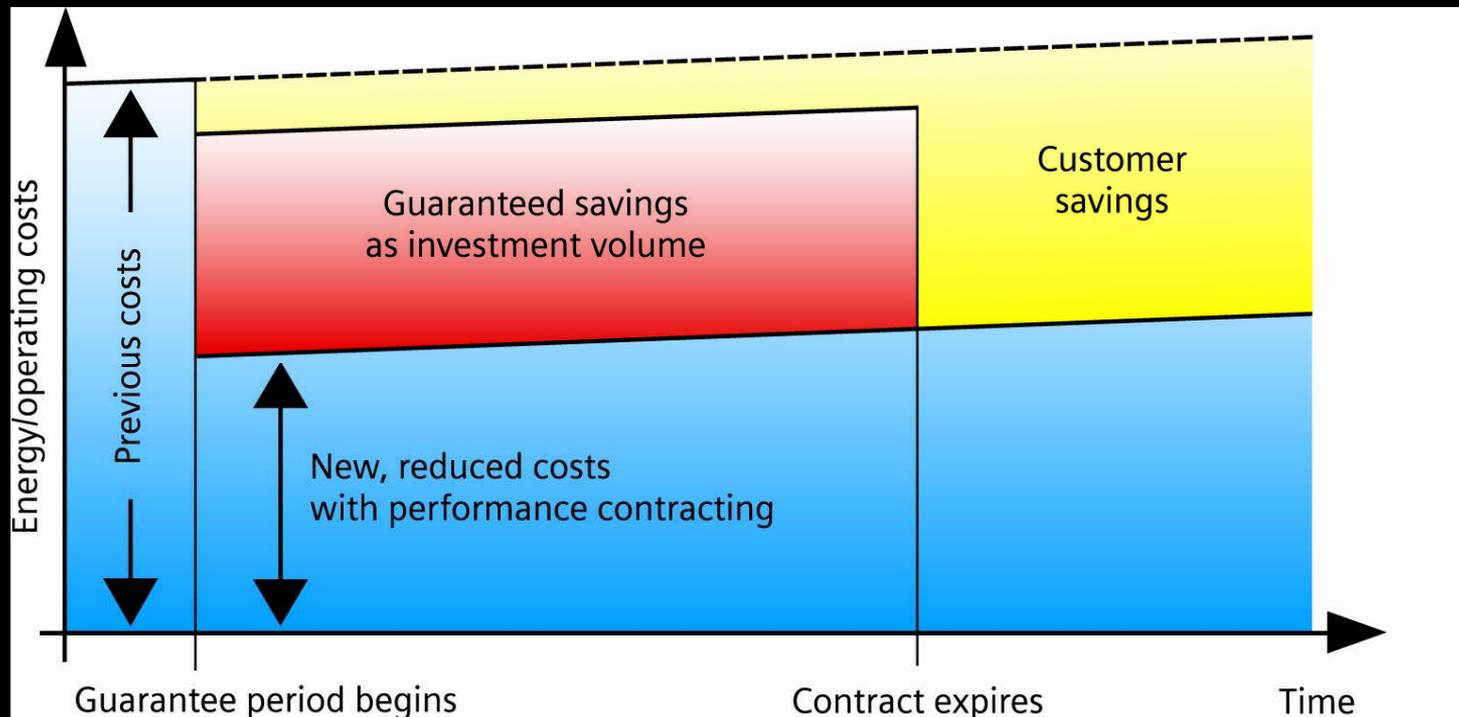
A Global financing and procurement model to quicken the pace of resource efficiency upgrades in existing buildings

A Proven Model

- Performance contracting developed in US and EU - partnership between building owners, financial institutions, Energy Service Companies (ESCO's)
- Future energy savings used to finance projects - no upfront capital required of building owner - no subsidies
- Transparent procurement process
- Energy savings guaranteed
- Attracts investment capital

Clinton Climate Initiative BUILDING RETROFIT PROGRAM FINANCING MODEL

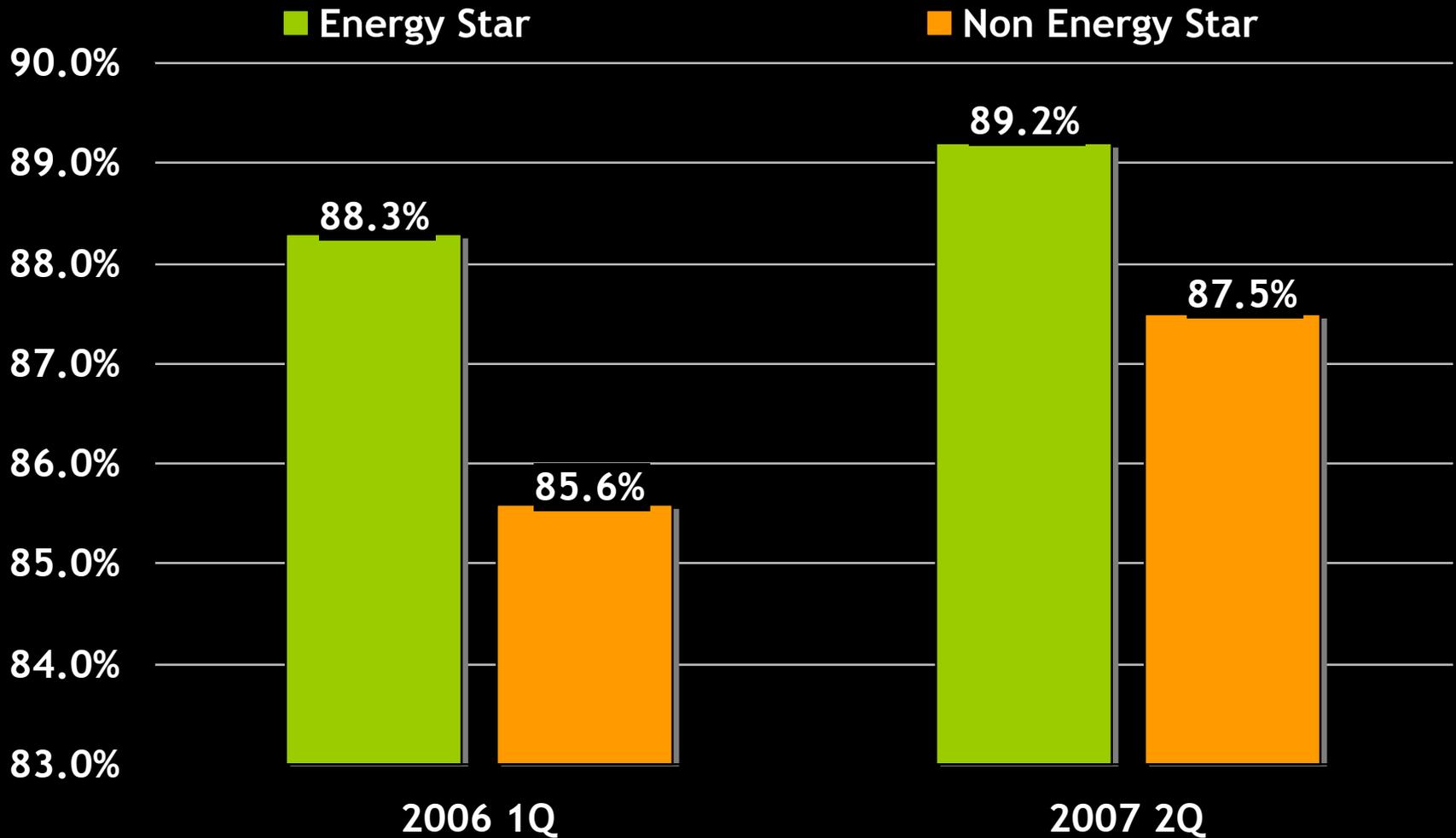
Cash flow timeline for guaranteed savings arrangement



- During the contract's early years the guaranteed energy savings (RED above) are allocated mostly to paying the ESCO and servicing debt costs
- Customer retains guaranteed savings not due to others and all savings beyond guaranteed level (YELLOW above)

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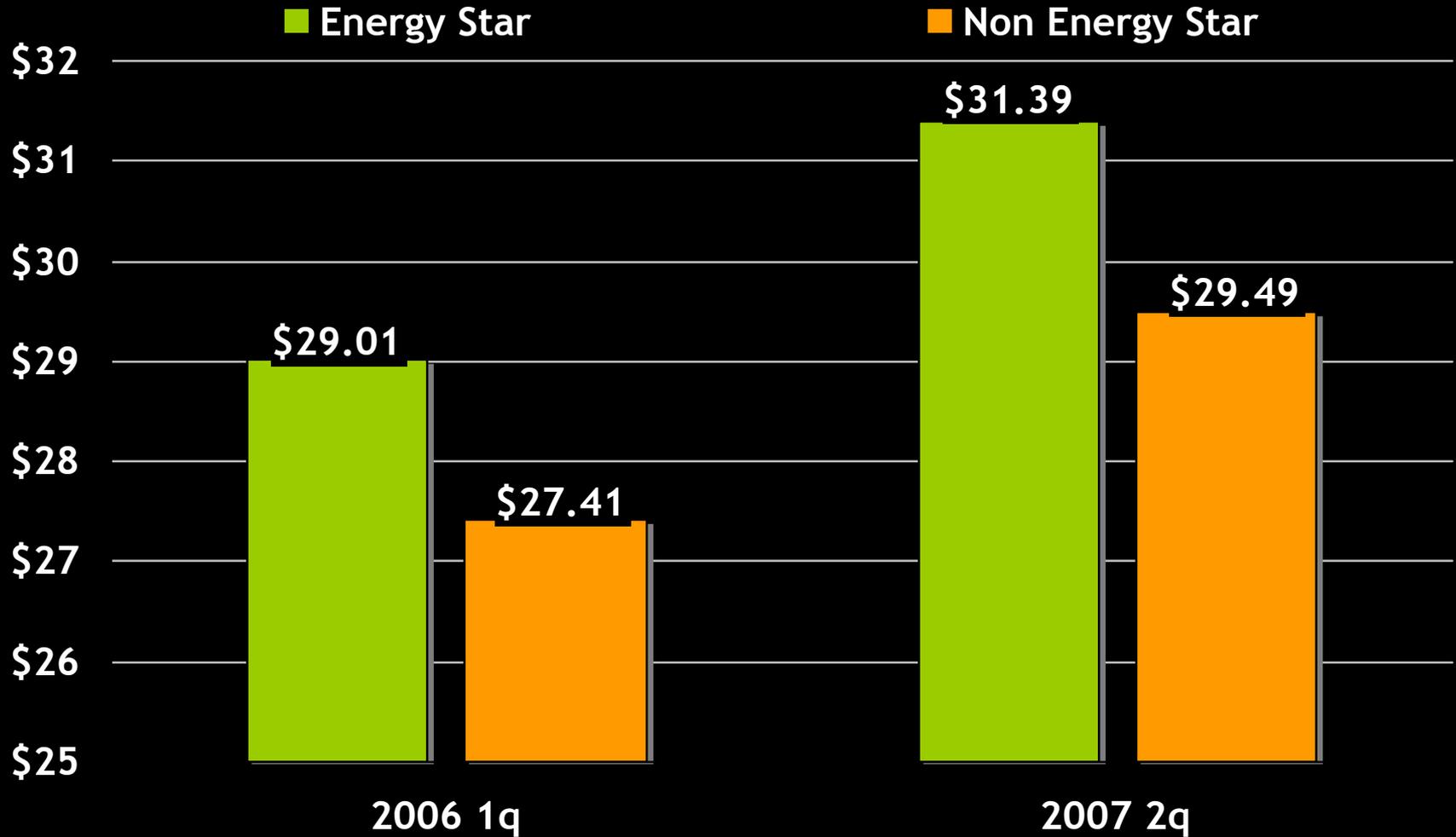
OCCUPANCY RATES



Source: CoStar

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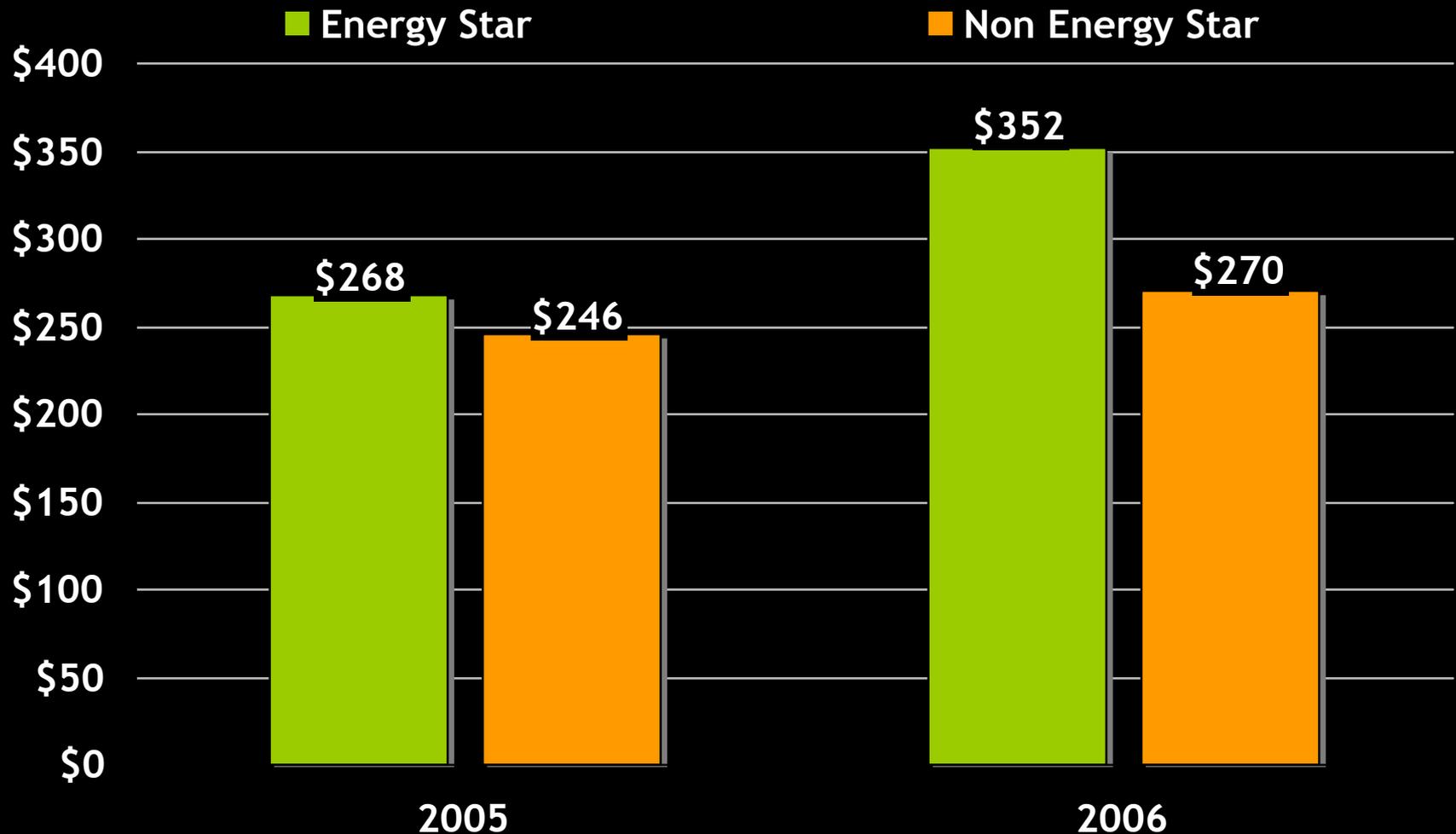
DIRECT RENTAL RATES



Source: CoStar

The Backdrop

SALES PRICES / SQUARE FOOT



Source: CoStar



SOUTHEAST FALSE CREEK



Southeast False Creek







Southeast False Creek

DESIGNING A COMPLETE COMMUNITY

- 33 hectare/81 acre site (21 city owned, 12 privately owned)
- 12,000 to 15,000 people
- 6 million square feet of development
- 20% affordable housing requirement, 33% objective - 250 affordable housing units as Olympic Legacy
- 10.5 hectare/26 acre park
- 5 licensed childcare facilities & 2 out-of-school care facilities
- Community centre including a non-motorized boating facility
- K-7 elementary school

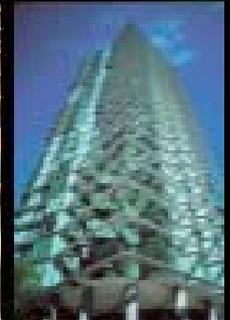
Southeast False Creek GREEN BUILDING STRATEGY

- Min LEED Silver; Goal of Gold; 1 bldg Platinum
- Minimum energy efficiency: 30-50% Beyond ASHRAE 90.1 2001
- Net Zero demonstration senior housing
- Full best practice building commissioning
- Specify energy efficient appliances
- Low parking ratios & car sharing vehicles
- Dual flush toilets & low flow fixtures
- 50% green roofs and urban agriculture
- Rainwater harvesting for toilets & irrigation
- 3 stream waste collection including composting
- 75% diversion of construction waste

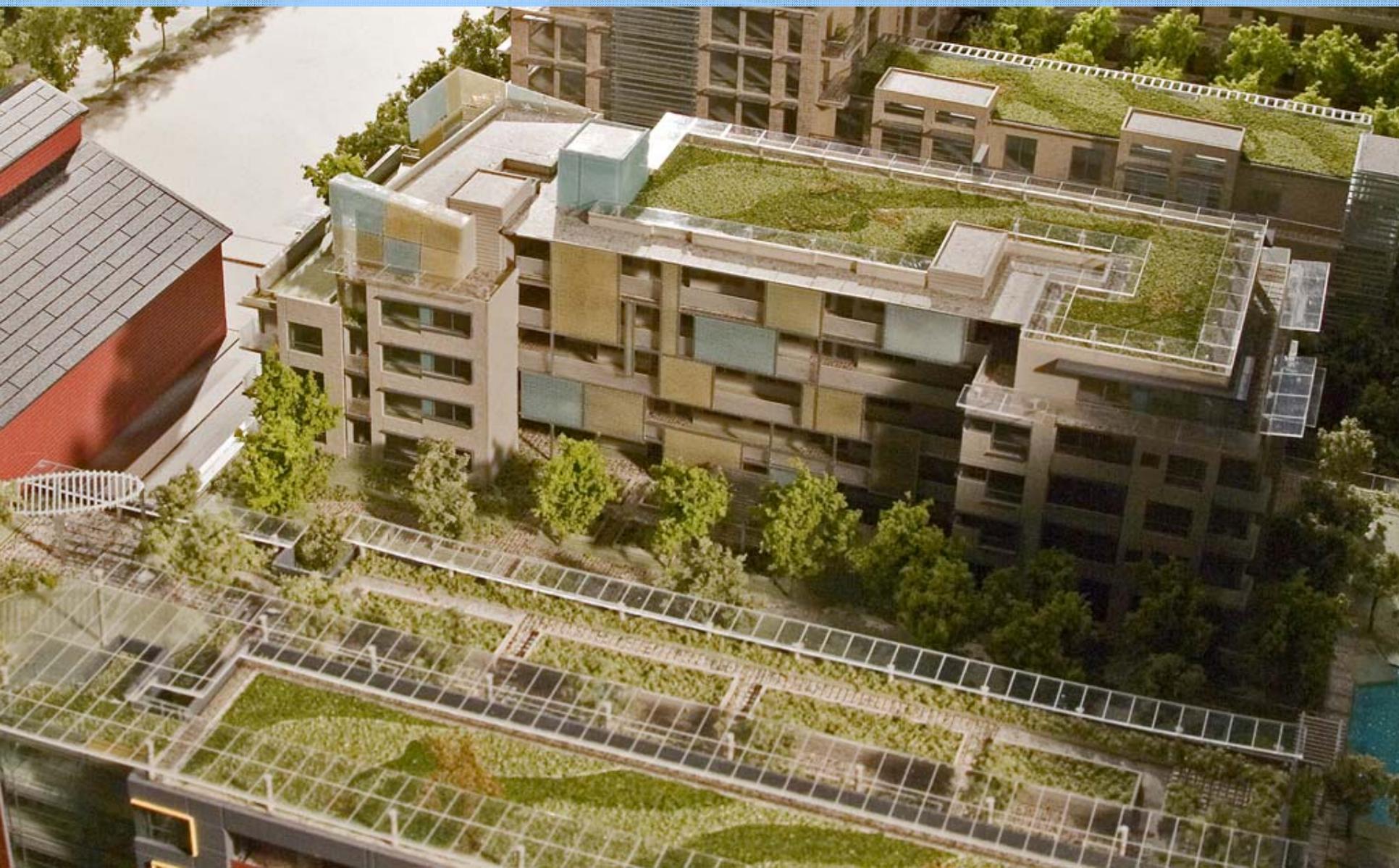


Southeast False Creek Passive Design

- Building orientation
- Maximizing light
- High performance envelop
- Natural ventilation shafts
- Extended south and west balconies
- Exterior walkways and corridors



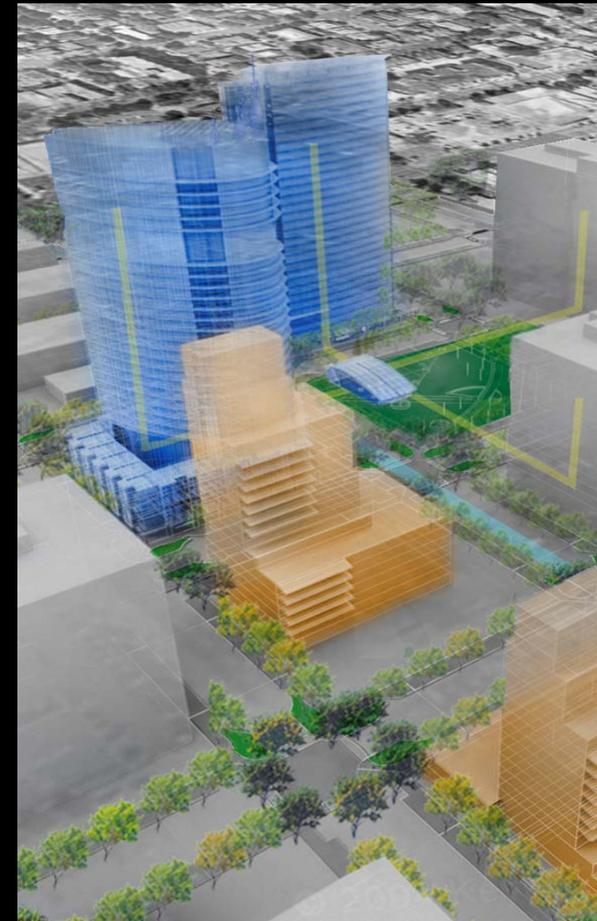
Southeast False Creek NET ZERO AFFORDABLE HOUSING PROJECT



Southeast False Creek

GREEN INFRASTRUCTURE STRATEGY

- Rainwater management system
- Neighbourhood Energy Utility
- Integrated park and urban agriculture strategy
- Foreshore reclamation and habitat enhancement
- Three stream waste management
- Multi-modal transportation strategy: streetcar, RAV, ferry, bicycles, pedestrian networks



Southeast False Creek

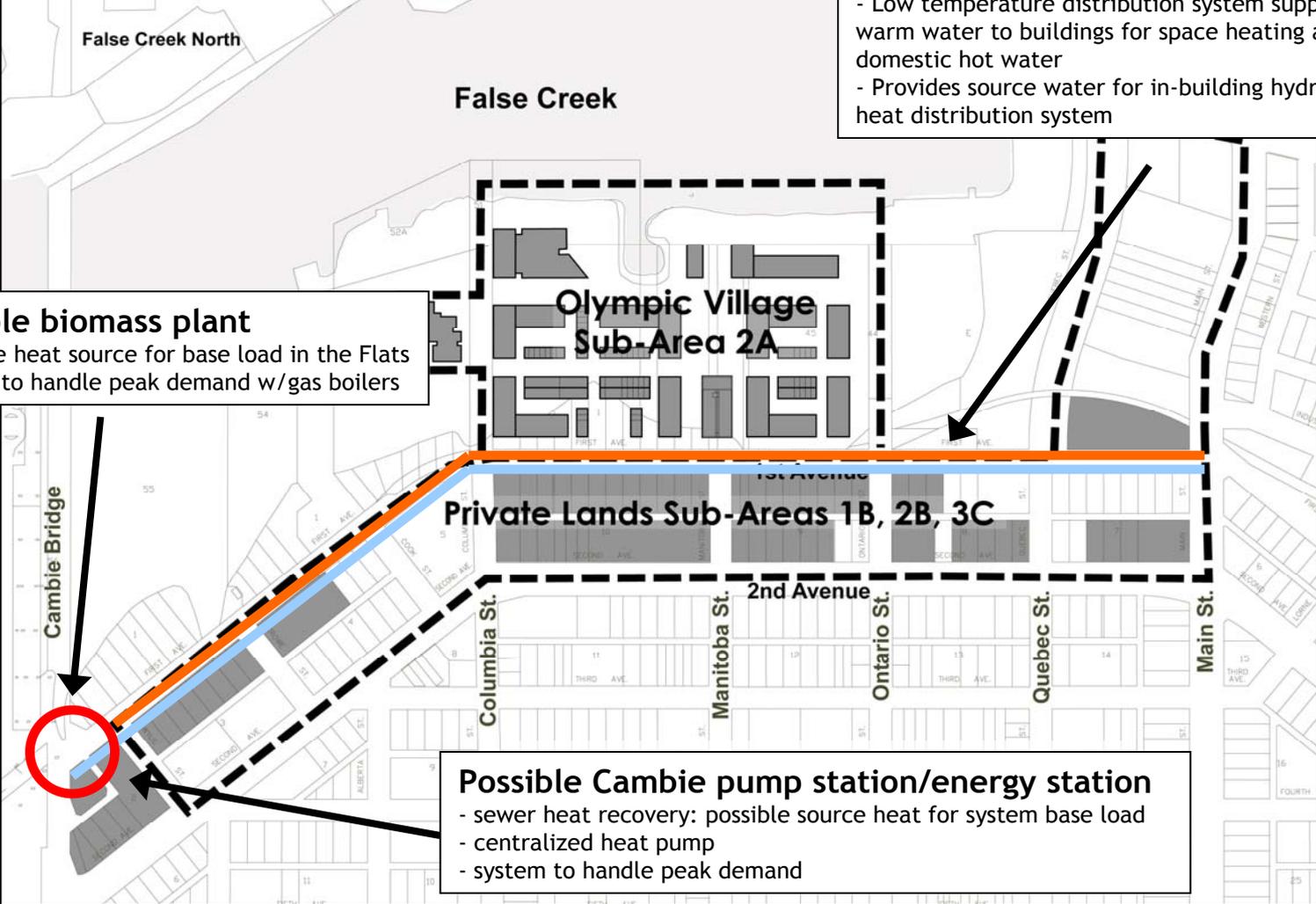
NEIGHBOURHOOD ENERGY UTILITY

Block scale water distribution

- Low temperature distribution system supplying warm water to buildings for space heating and domestic hot water
- Provides source water for in-building hydronic heat distribution system

Possible biomass plant

- Possible heat source for base load in the Flats
- system to handle peak demand w/gas boilers



Possible Cambie pump station/energy station

- sewer heat recovery: possible source heat for system base load
- centralized heat pump
- system to handle peak demand

Southeast False Creek NEIGHBORHOOD ENERGY UTILITY



Hot Water Loop



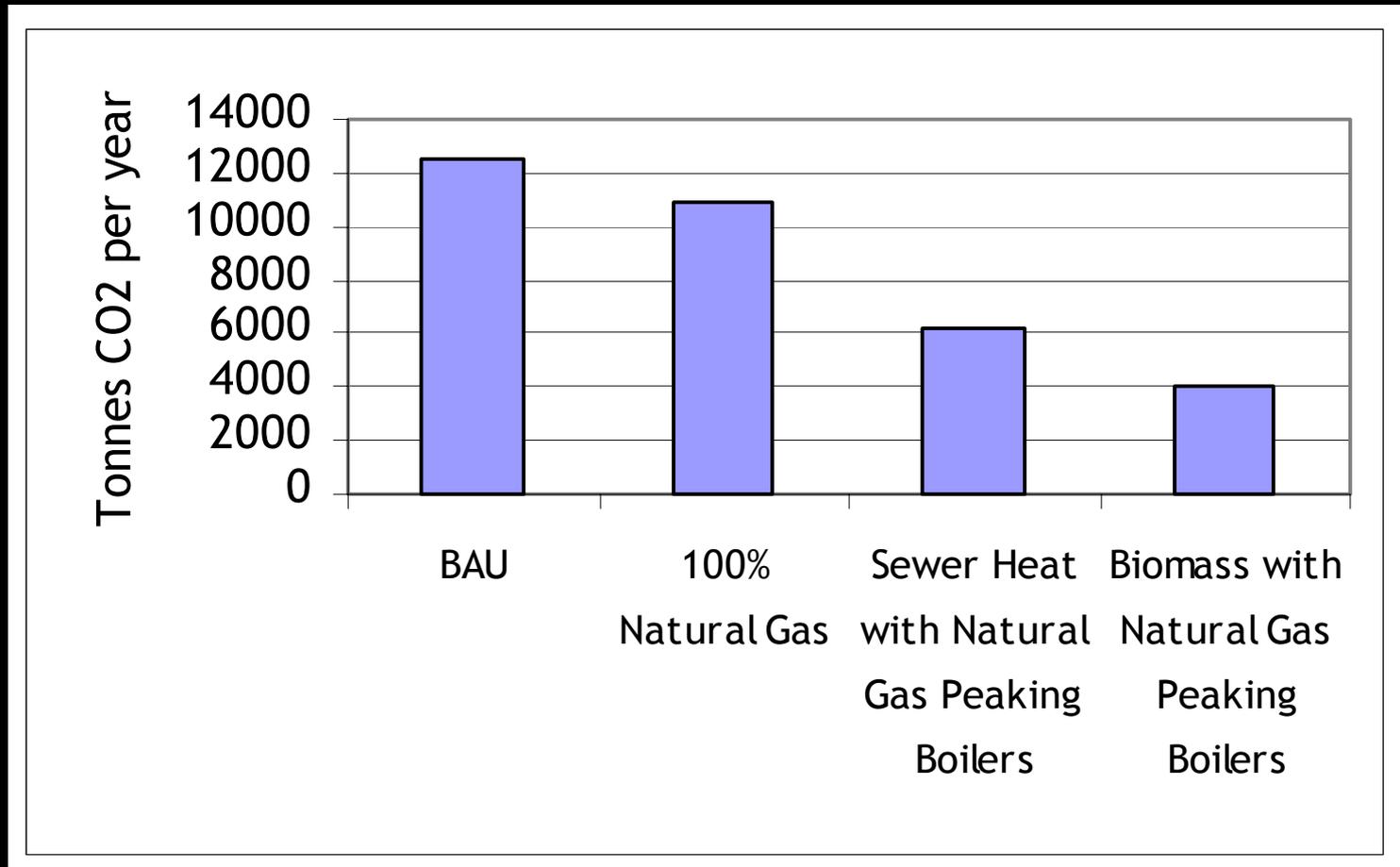
Typical In Building Boiler



DE Energy Transfer Station

Southeast False Creek NEIGHBORHOOD ENERGY UTILITY

Projected Greenhouse Gas Emissions



Southeast False Creek NEIGHBORHOOD ENERGY UTILITY

Proforma Scenario Results

| | Base Case | High Outcome | Low Outcome | Worst Case |
|--|---|---|------------------------|---|
| Annual GHG Reductions (tonnes/year) | 6,200 | 14,000 | 3,000 | 0 |
| Real return on Investment (net of inflation) | 7.2% | 5.2% | 2.7% | 2.9% |
| Cumulative Value of Fixed Assets in 2020 (Excluding Depreciation) | \$27.0 million | \$42.4 million | \$15.6 million | \$8.6 million |
| Cumulative Net Capital Contribution Required from City | \$14 million in 2010 increasing to \$16.5 million by 2015 | \$12 million in 2010 increasing to \$22 million by 2015 | \$13.2 million in 2010 | \$3.6 million in 2010 increasing to \$5.2 million by 2015 |

Contact Information

CLINTON CLIMATE INITIATIVE

Rob Bennett, CCI
503-802-6649
rbennett@clintonfoundation.org
www.C40cities.org
www.clintonfoundation.org



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