

Zero Emissions Buildings Plan



Council Presentation
July 12, 2016

GREEN BUILDINGS

Lead the world in green building design and construction

Greenest City 2020:

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

Renewable City Strategy:

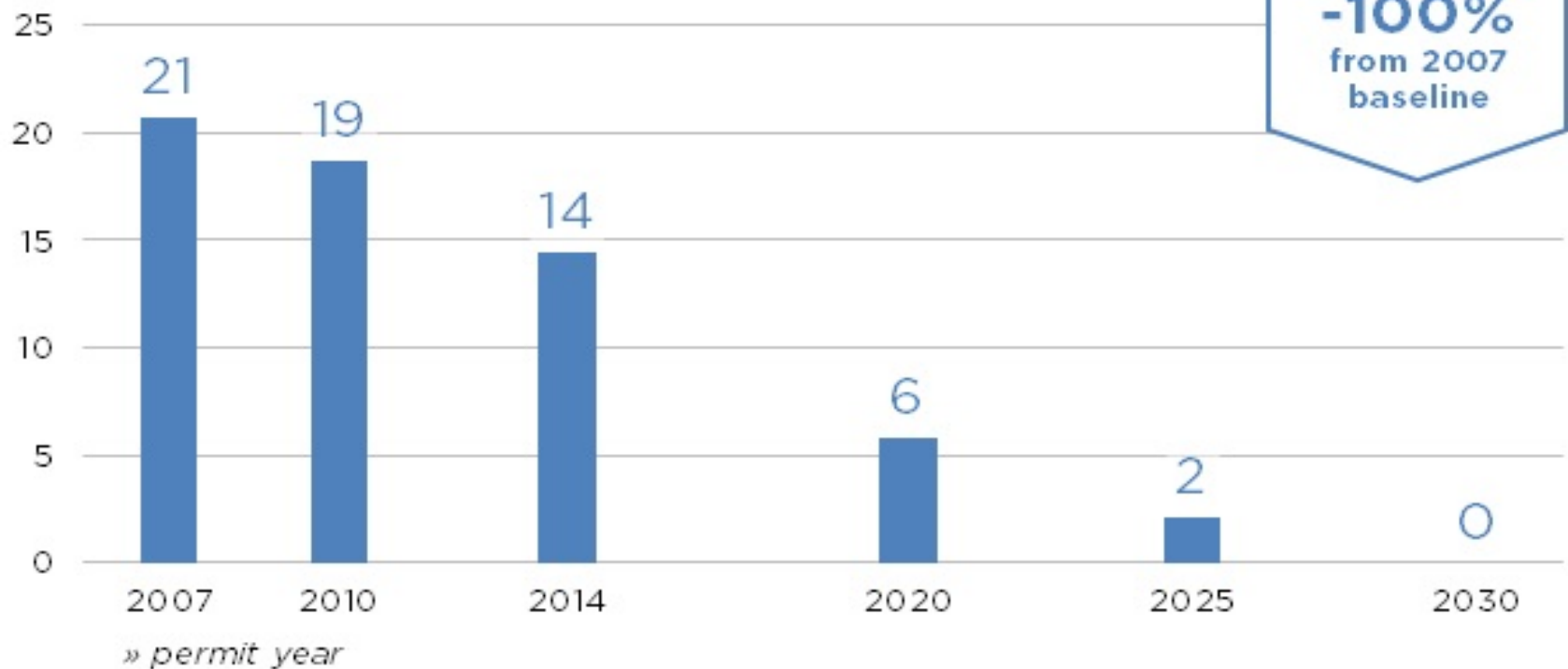
100% of energy used is renewable by 2050

New buildings required to use 100% renewable energy by 2030 or earlier

New Building Emissions and Targets

Annual GHG Emissions of New Buildings

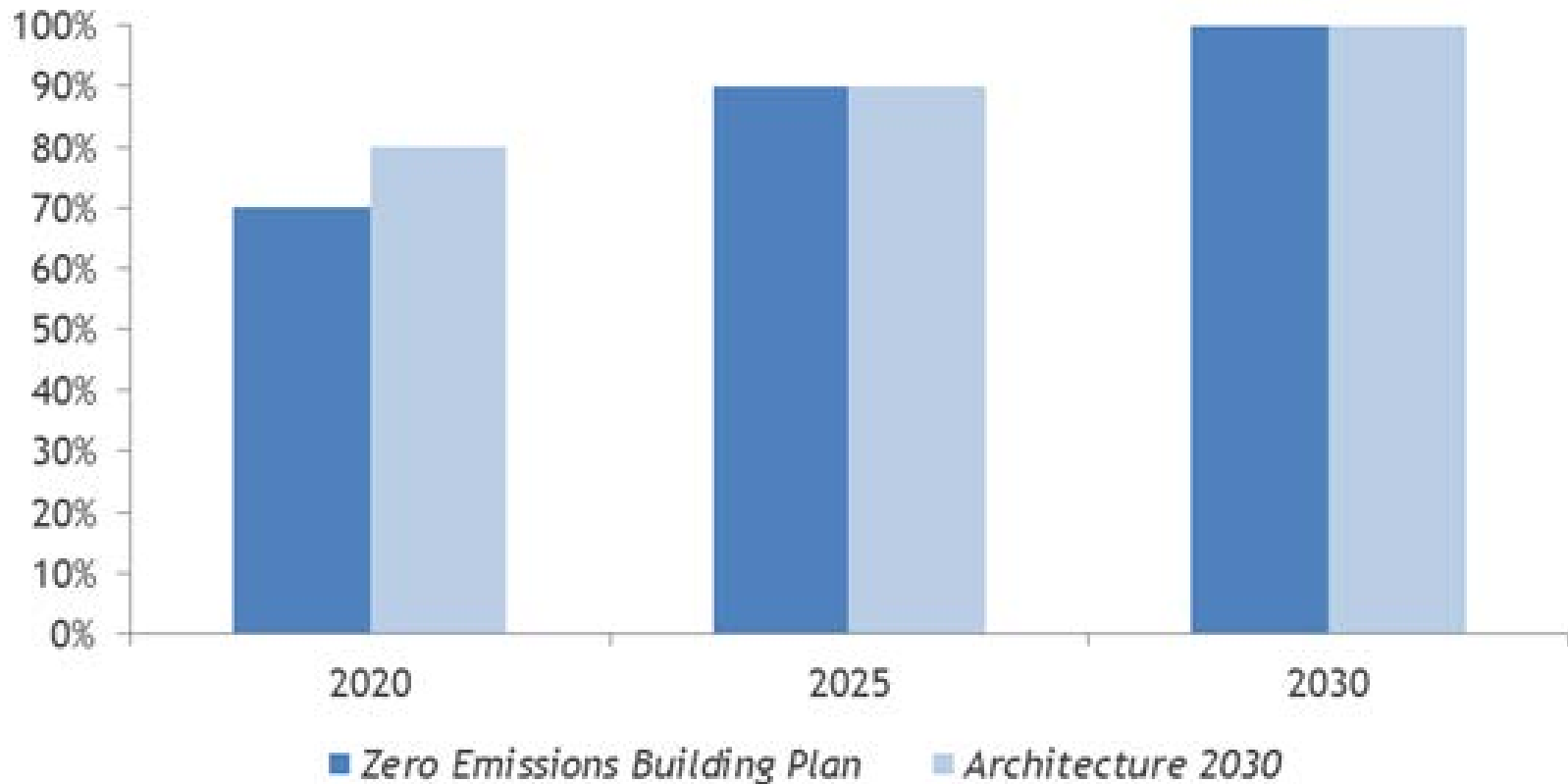
kgCO₂/m²



Weighted Average GHG Intensity of New Buildings (all types)

North American Leadership

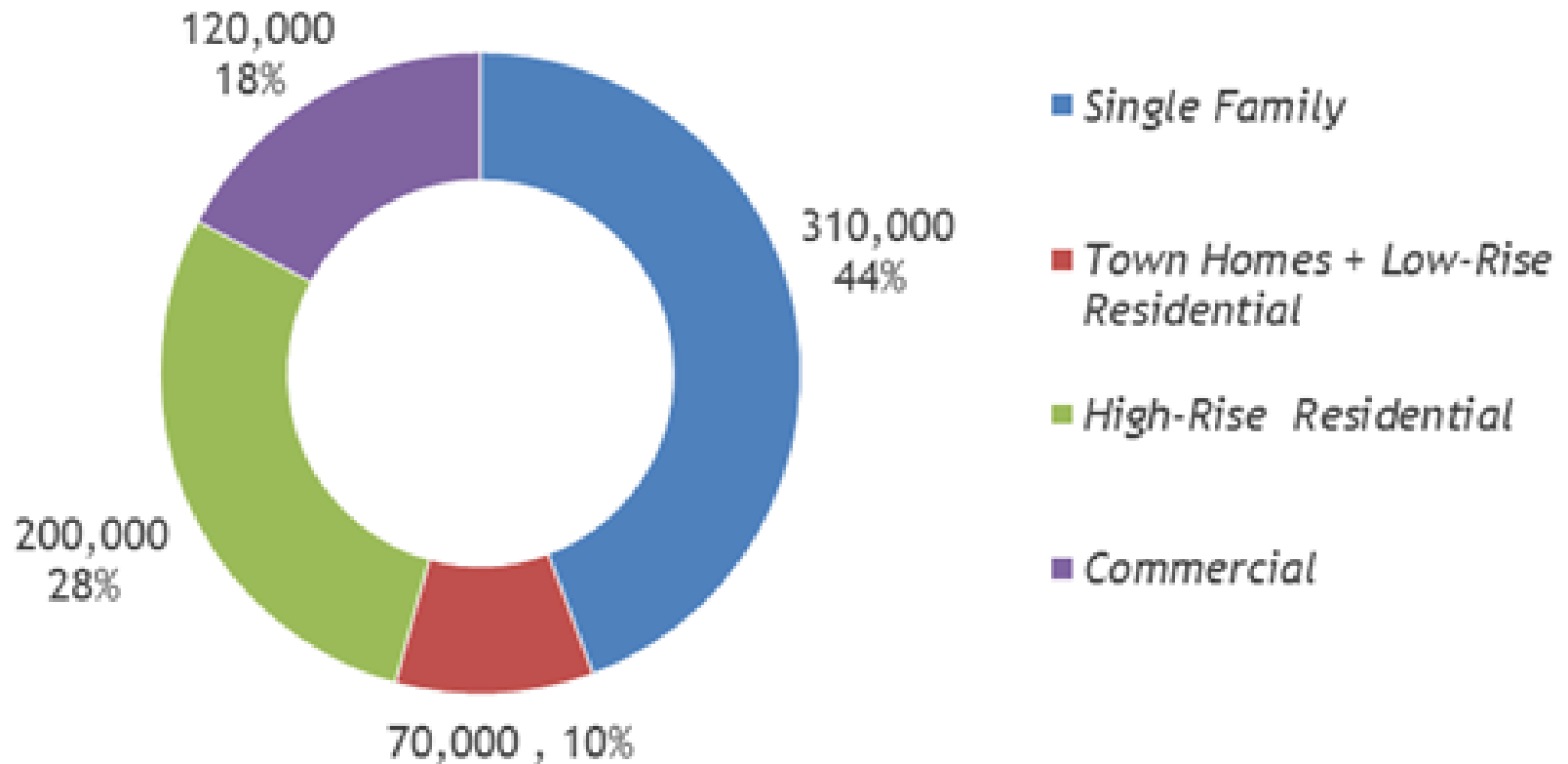
GHG Reduction Targets in New Buildings



First major city in North America to commit to and have an actionable plan to achieve zero emissions new buildings by 2030.

Area of New Buildings per Year

2020 Built Area by Building Type (m²)



Plan focuses initial action on GHG reduction in new residential buildings (82% of new development)



Zero Emissions Building Plan Outline

1. Limits: GHG and thermal energy demand
2. Leadership: New City-owned buildings aim to achieve zero emissions
3. Catalyst Tools: support private sector leadership
4. Capacity Building: invest in tools to develop & share knowledge and to remove barriers



Two Pathways to reliably achieve zero emissions for new buildings

1. Reduce: focus on very efficient building envelopes and ventilation systems

OR

2. Renewable: connect to a Neighbourhood Renewable Energy System

Passive House Standard



- Leading global standard for efficient building envelopes; typically = 80% reduction in space heating energy use
- Focus on insulation, windows, air tightness, ventilation heat recovery, and thermal comfort
- Applicable to all building types; most examples/data for low-rise residential
- Supported by extensive building science research, design tools, training, and third party validation
- Useful *tool* in the transition to zero emission new buildings



Detached House GHG Targets

- 44% of all new building area
- 2014 Building Bylaw: 48% lower GHG than 2007
- No major new requirements prior to 2020
- Initial focus on catalyst tools and capacity building (including an emphasis of new tools to support ethnic builders)

Low-Rise MURB GHG Targets



- 3-6 Story MURBs = 10% of all new building area
- Ideal form for Passive House
- Bylaw Update (Q4 2016) = align with detached house requirements and reduce GHGI 56% from current practice
- 2020 Rezoning Policy to require Passive House: catalyst tools and capacity building required



High-Rise MURB GHG Targets

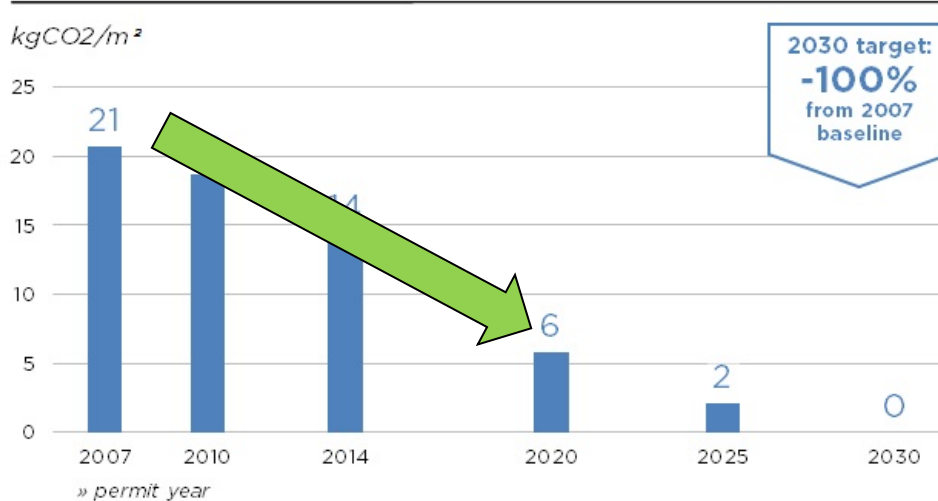
- High-Rise MURBs (>6 stories) = 28% of all new building area
- RNES connection and/OR envelope and ventilation improvements
- Rezoning Policy update (Q4 2016) = 61% GHG reduction compared to current policy requirements
- Incremental construction costs (improved envelope) offset by savings (simplified heating system)

Rezoning Policy For Green Buildings

- **Impacts 55%+** of new MURB and commercial development
- Q4 2016: **restructure to focus** on priorities (GHGI and thermal energy limits, indoor air quality, water conservation)
- Clear **compliance** requirements and tools essential
- Include:
 - ✓ air barrier testing
 - ✓ post-occupancy energy use reporting
 - ✓ improved commissioning
 - ✓ reporting of embodied emissions

Carbon Neutral New Buildings by 2020

Annual GHG Emissions of New Buildings



Carbon Neutral:
*reduce emissions
and/OR offset to
achieve net zero
emissions*

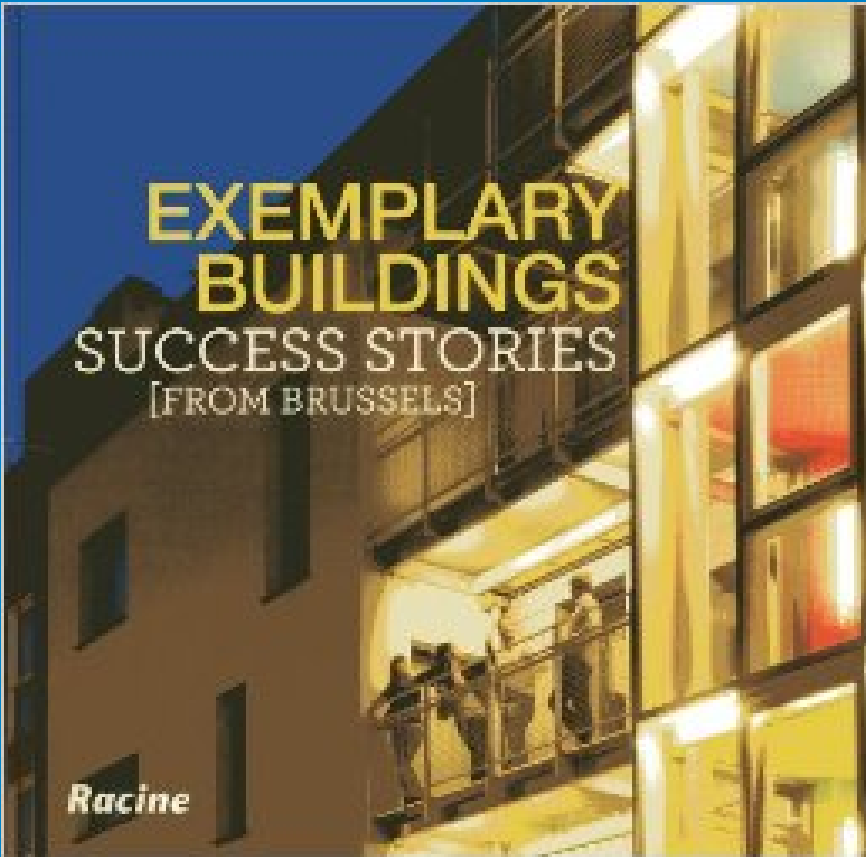
- **This Plan = 70% reduction in GHG (without offsets) by 2020**
- **Vancouver's authority does not enable both GHGI limits and carbon neutral requirements in the Building Bylaw**
- **Explore carbon neutral requirement for 2020 Rezoning Policy updates and make recommendations re: offset mechanisms**



2. CITY LEADERSHIP

- All City-owned and VAHA projects pursue Passive House certification (or other zero emissions approach) *where feasible*
- Detailed policy for zero emissions in all City-led and VAHA developments within 2 years

3. Catalyst Tools



- Catalyze private sector leaders to begin developing zero emission buildings now
- Brussel's "Batex" Program is starting point. Included regular call for entries, winners judged on GHG reduction, cost effectiveness, neighbourhood fit/appeal, prize = \$13/ft²

3. Catalyst Tools

- \$1.6 million to develop and run 3-year Zero Emission Home Program
- Explore options and recommend tools to catalyze multi-unit residential and commercial zero emission buildings (expedited permitting? reduced city charges? etc)
- Engage developers of special sites to assess and pursue near zero emissions



4. CAPACITY BUILDING

- Remove policy barriers
- Fund case study development/sharing
- Public education
- Zero Emission Building Centre of Excellence
 - ✓ Facilitate workshops, dialogues, peer-to-peer knowledge sharing
 - ✓ Curated research library of best practices
 - ✓ Identify trends



Luminaires: Choosing the Right Fixture for the Function

One size does not fit all



The Bottom Line

Luminaires are flexible and should be selected as long-term solutions. Some types of light fixtures (especially those with dimmer functionality) should be considered proper tools to actively monitor and reconfigure lighting control zones should be employed to take advantage of different luminaire types or functions.

be ex

building energy exchange



RENEWABLE CITY STRATEGY

2015-2050



- Zero emission new buildings: highest priority for achieving 100% renewable energy by 2050
- Builds off successes and lessons since GCAP: Rezoning Policy for Green Buildings, Neighbourhood Renewable Energy Strategy, 2014 Building Bylaw
- Significant immediate actions: GHG limits in rezoning policy and building bylaw updates, City demonstration projects, catalyst tools, Zero Emissions Building Centre of Excellence

QUESTIONS?