



IDEA2022

Building Connections

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INTERNATIONAL
DISTRICT ENERGY
ASSOCIATION

Green Heat Offerings: Enabling Customer Retention and Expansion during the Low-Carbon Energy Transition

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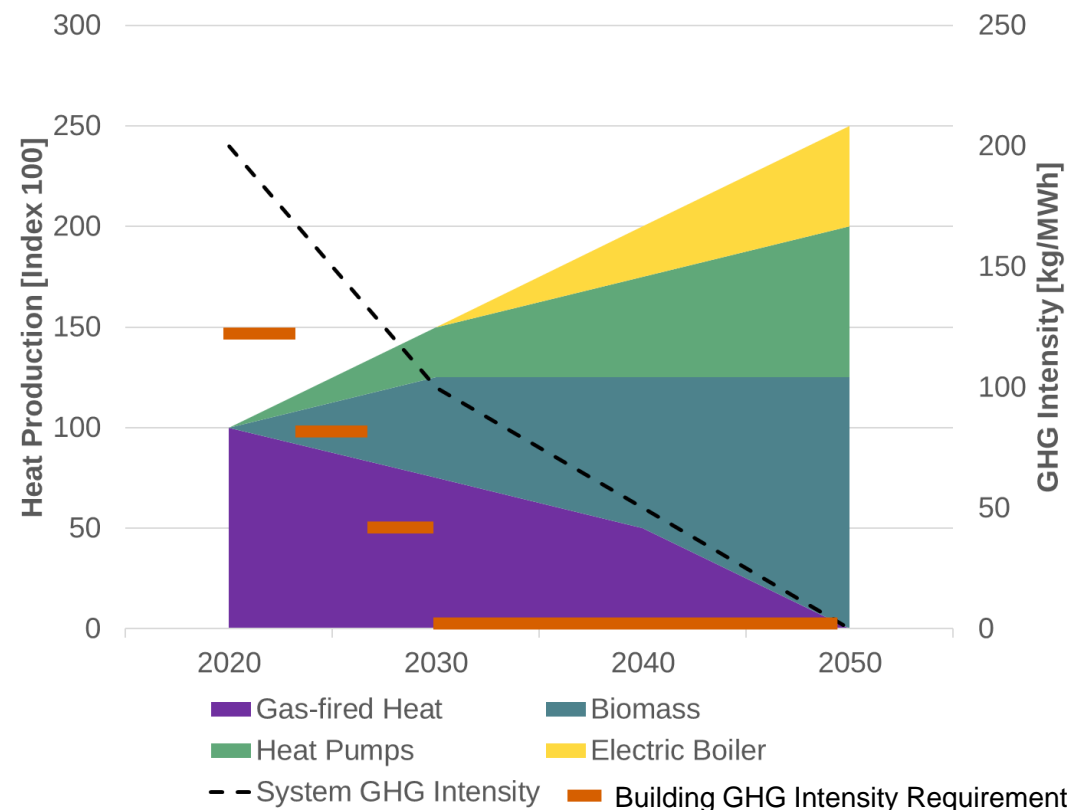
**Speaking on behalf of Ashley St. Clair*



Problem



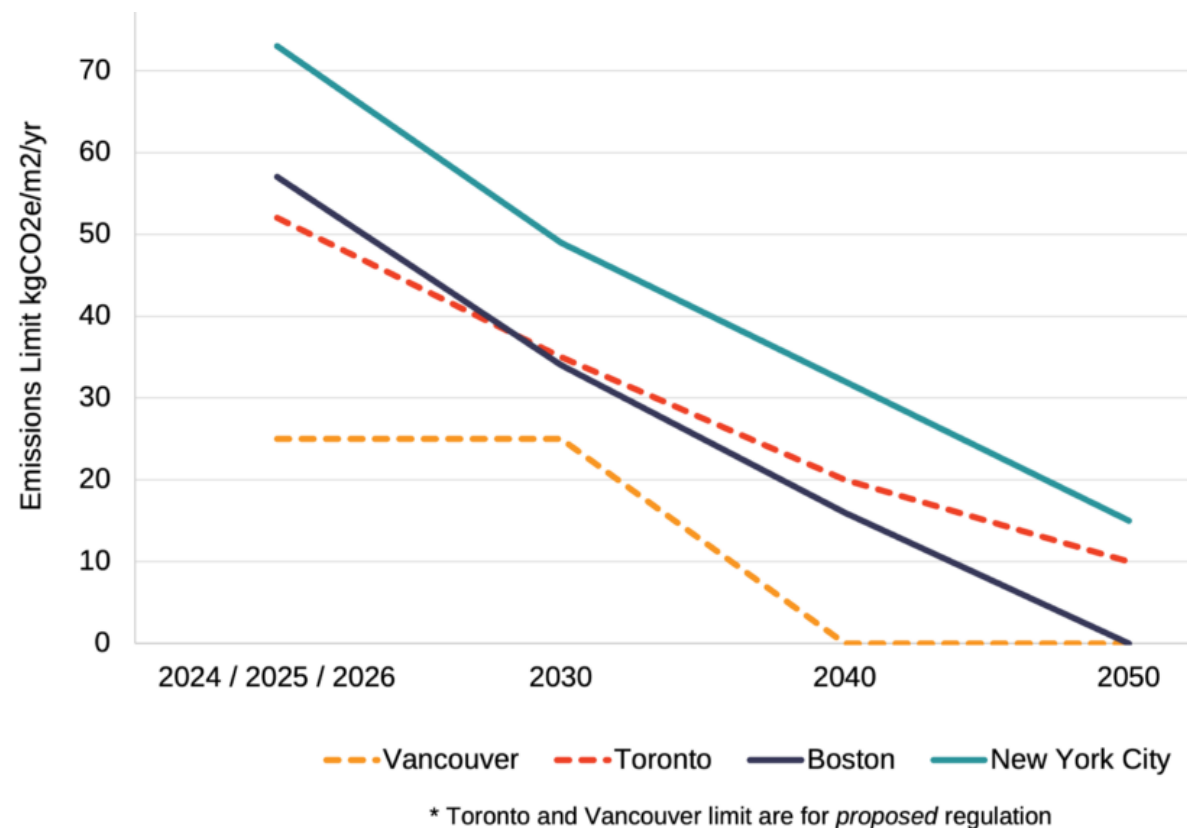
- Progressive Green Building Standards require new (and eventually existing) buildings to be low carbon
- In many cases, buildings facing these stringent GHG requirements cannot demonstrate compliance with service to a 'high-carbon' DE network
- This leaves DE providers with 3 options:
 - 1) Decarbonize the entire system to match the most stringent requirement
 - 2) Don't connect / disconnect the new/existing building with the more stringent requirement
 - 3) Create (some version of) a Green Heat program



Where Does the need exist?



- In jurisdictions with a green building standard has a direct GHG requirement
 - Vancouver (Zero Emission Building policy)
 - Toronto (Toronto Green Standard)
 - NYC (Local Law 97)
 - Boston (BERDO)
- In areas where buildings are seeking 3rd party certification to programs
 - Canada Green Building Council (CaGBC) Zero Carbon Building Standard (ZcB)
- Greenhouse Gas Intensity (GHGi)
 - CAN [kg/m²/yr]
 - US [lbs/sf/yr]



Green Heat Offering

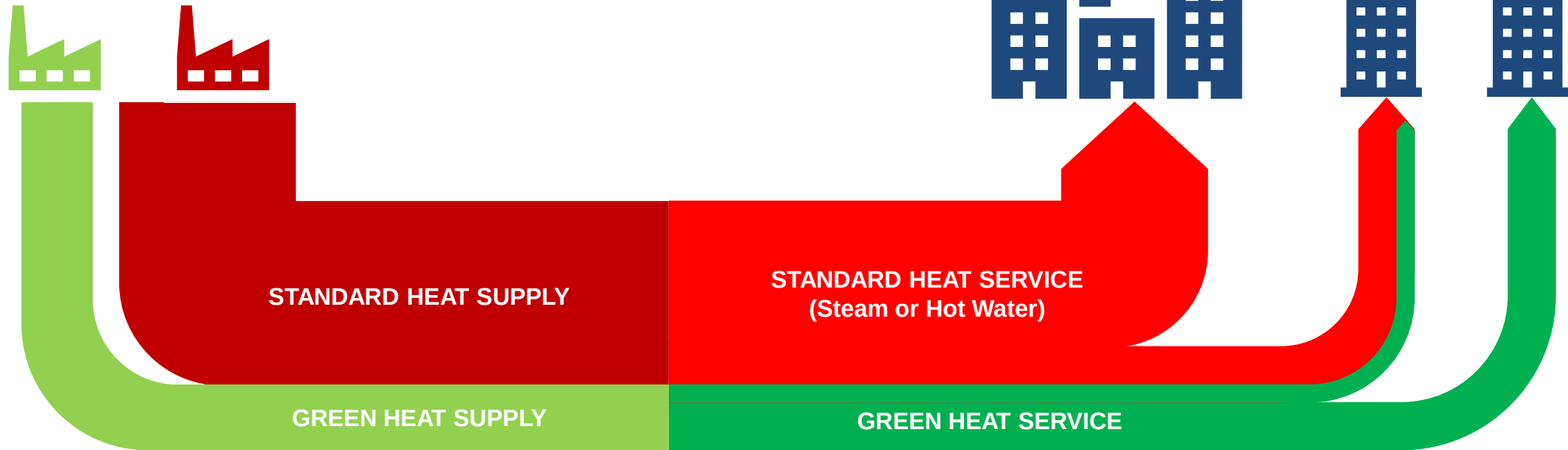
RESHAPE
STRATEGIES

GREEN
HEAT
SOURCES

STANDARD
HEAT
SOURCES

EXISTING BUILDINGS
(no Green Heat)

NEW OR EXISTING
BUILDING
(Blended) (100% Green
Heat)



Green Heat Programs in Development

Enwave Toronto

- Toronto Green Standard v4 came into effect May 1, 2022
 - All new buildings need to have ~25% of heat from low carbon sources
 - Existing system has a very small share on low carbon resources < 5%
 - Without a Green Heat Program (or decarbonizing 25% of their existing system) they cannot connect new customers



City of Vancouver False Creek NEU

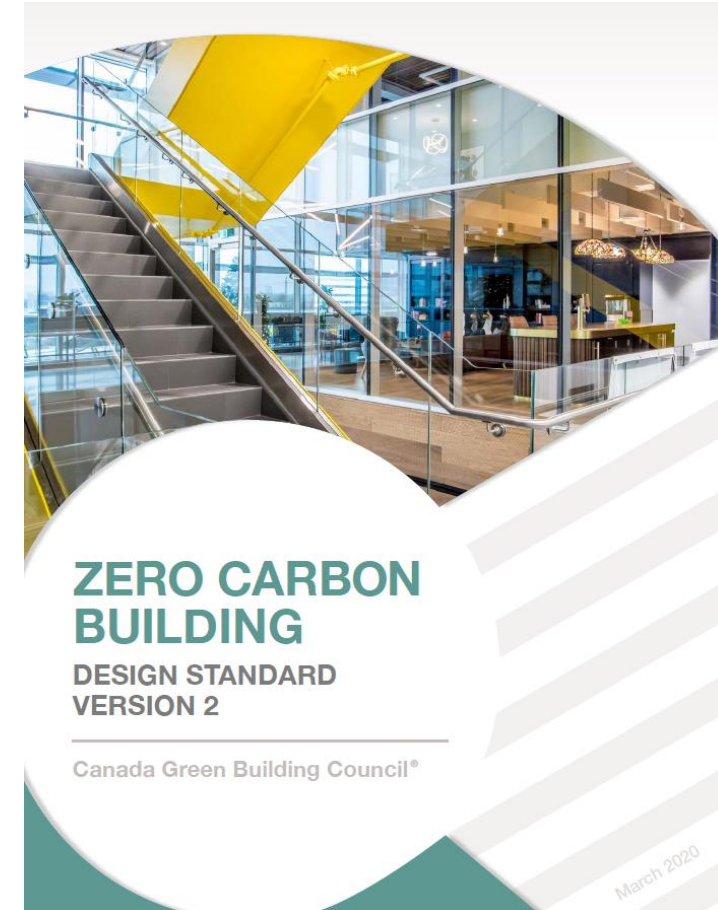
- City of Vancouver's Zero Emission's Building Plan has been in place since 2019.
- To date new buildings connected to the False Creek NEU have been able to satisfy the GHGi requirement because the system is ~70% renewable
- However, when new wave of requirements comes into effect in 2024, the system will require a Green Heat program to connect new customers



Case Study – CaGBC ZcB Standard



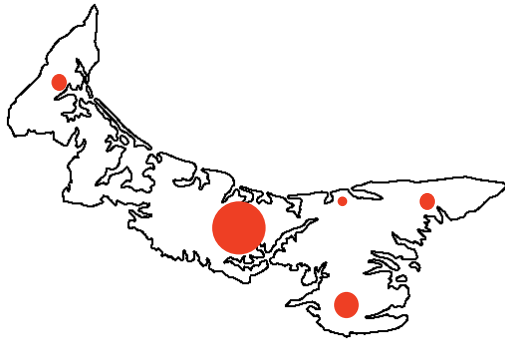
- Superseding LEED as the most highly recognized green building standard in Canada
- Through consultations with Enwave, Reshape, E-NGOs, Building Owner's Groups, and the Energy Modelling Community a Green Heat program was established
- CaGBC will recognize Green Heat Offerings in v3 of the ZcB Standard to be released in Spring/Summer 2023
- Our expectation is that most other green building standards (municipal and other third party standards) will adopt CaGBC's treatment of Green Heat



ZcB Green Heat Requirements

RESHAPE
STRATEGIES

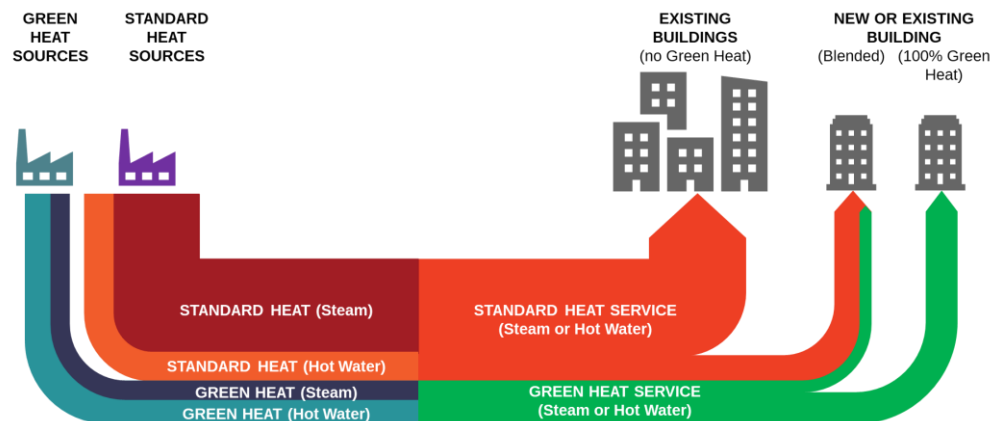
Green Heat within a 'Market' (Province)



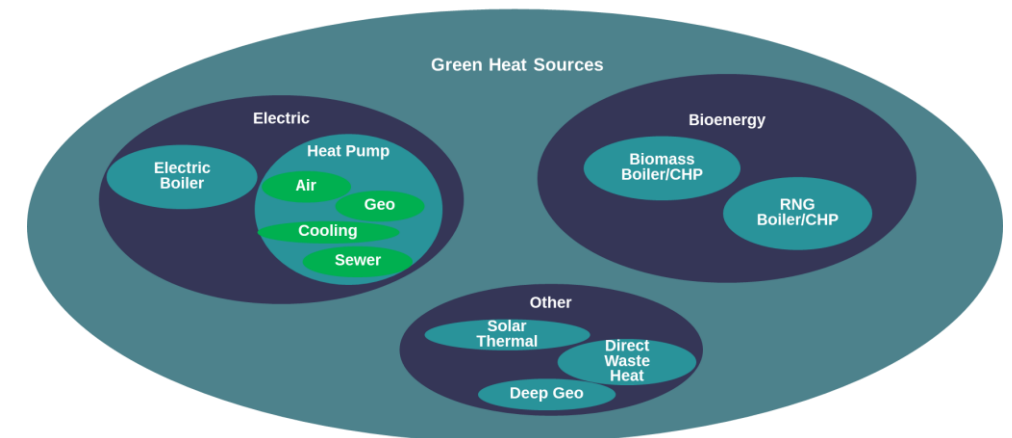
Banking and Backstopping



No Differentiation b/w Steam and Hot Water



Blending GHG Intensity of Green Heat Sources



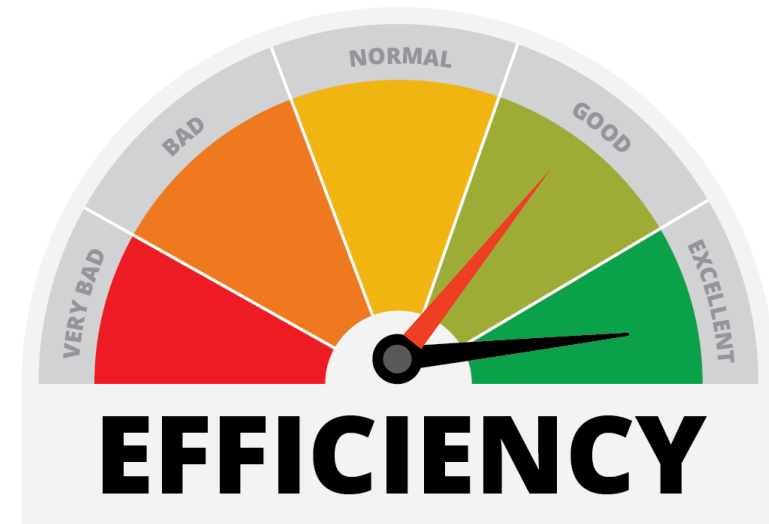
ZcB Green Heat – Outstanding Items



Transition Plan with no Combustion



Efficiency



— Building Requirement

— Overall DE System Performance

Future of Green Heat



- DE systems in jurisdictions that are directly regulating the GHG emissions from buildings will need to have some version of a Green Heat Offering
- In order to meet climate targets, all jurisdictions will need to regulate GHG emissions in some way shape or form
- It is not an overstatement to say that most DE systems will have some form of Green Heat program eventually (and temporarily)
- Temporarily because once all of the system has been decarbonized (i.e. Net Zero), there is no need for a Green Heat program – because all heat is Green Heat

Green Heat is a Bridge to Net Zero for DE Systems





**Enwave
Charlottetown**



**Enwave
Markham**



**Enwave
London**



**Enwave
Windsor**



**Enwave
Toronto**



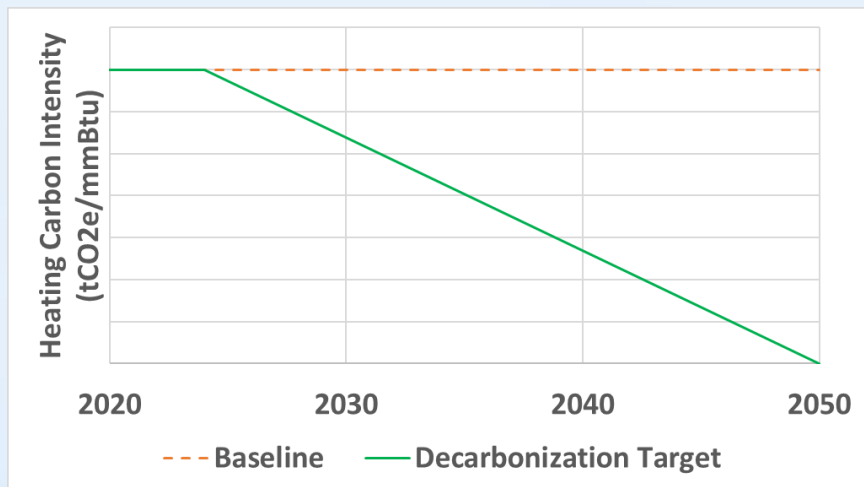
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**ONTARIO
TEACHERS'**
PENSION PLAN

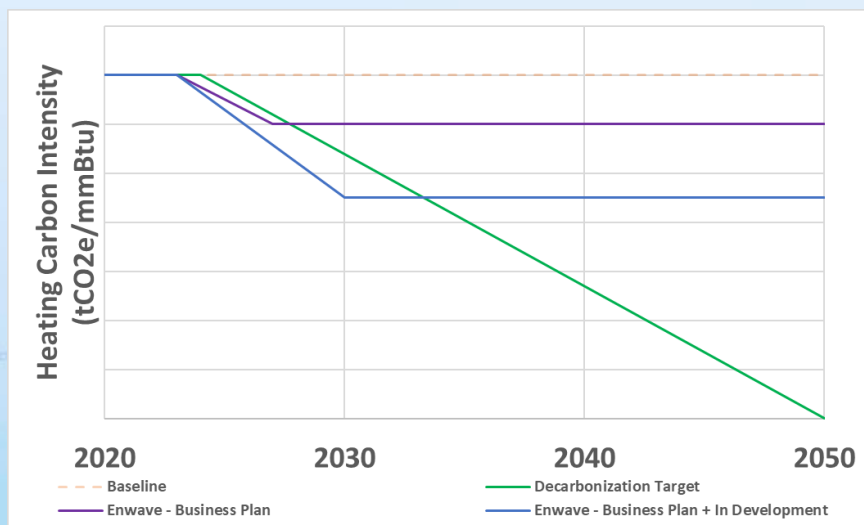


Decarbonization Timeline



Decarbonization Requirements

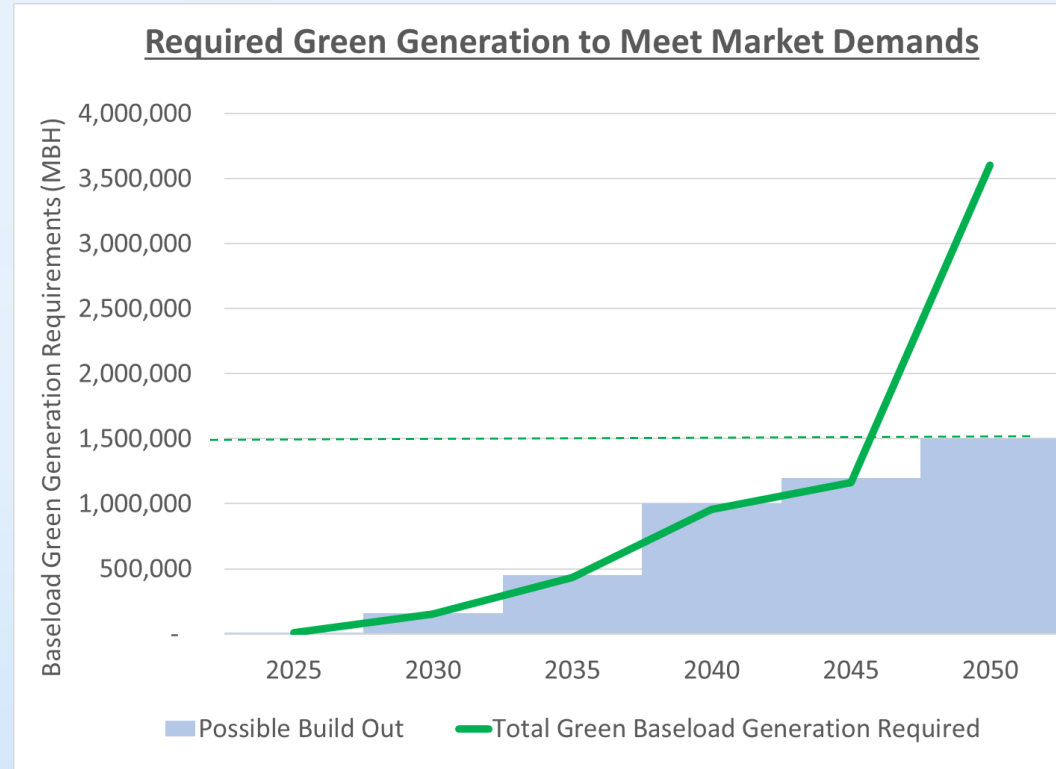
Based on Policy changes and Customer goals, we anticipate the need to reduce our Toronto heating business (steam and hot water) carbon intensity by 80% by 2040



Current Status & Decarbonization Gap

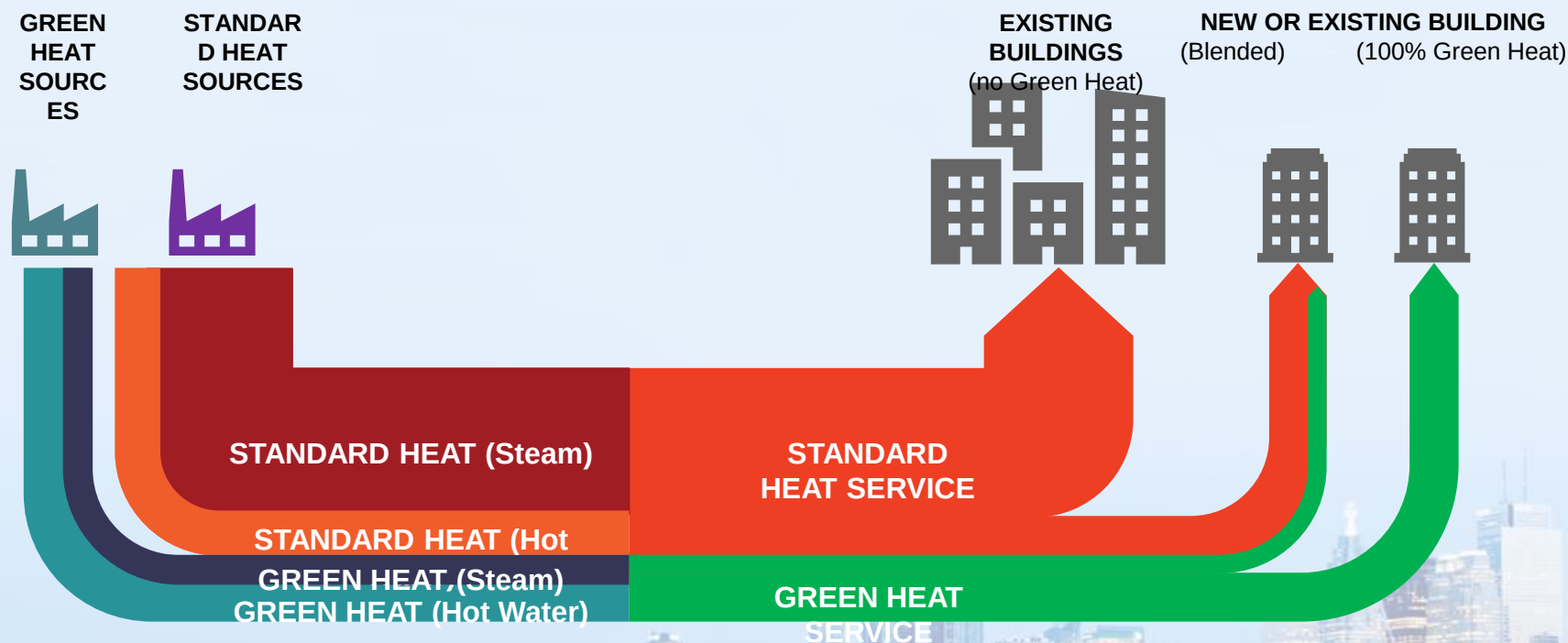
Projects included in our business plan have us meeting the blended system carbon intensity forecast by 2027
Including “In Development” projects, this is extended to 2030

Green Heat Capacity Build-Out



- **Significant Low Carbon Baseload Generation Requirement**
 - Addition of ~250,000 MBH (75 MW) of green baseload capacity every 5 years from 2030-2050
 - Green Heat banking can smooth steps between major project build out
 - Low-capital peaking desirable

Enwave Green Heat Supply

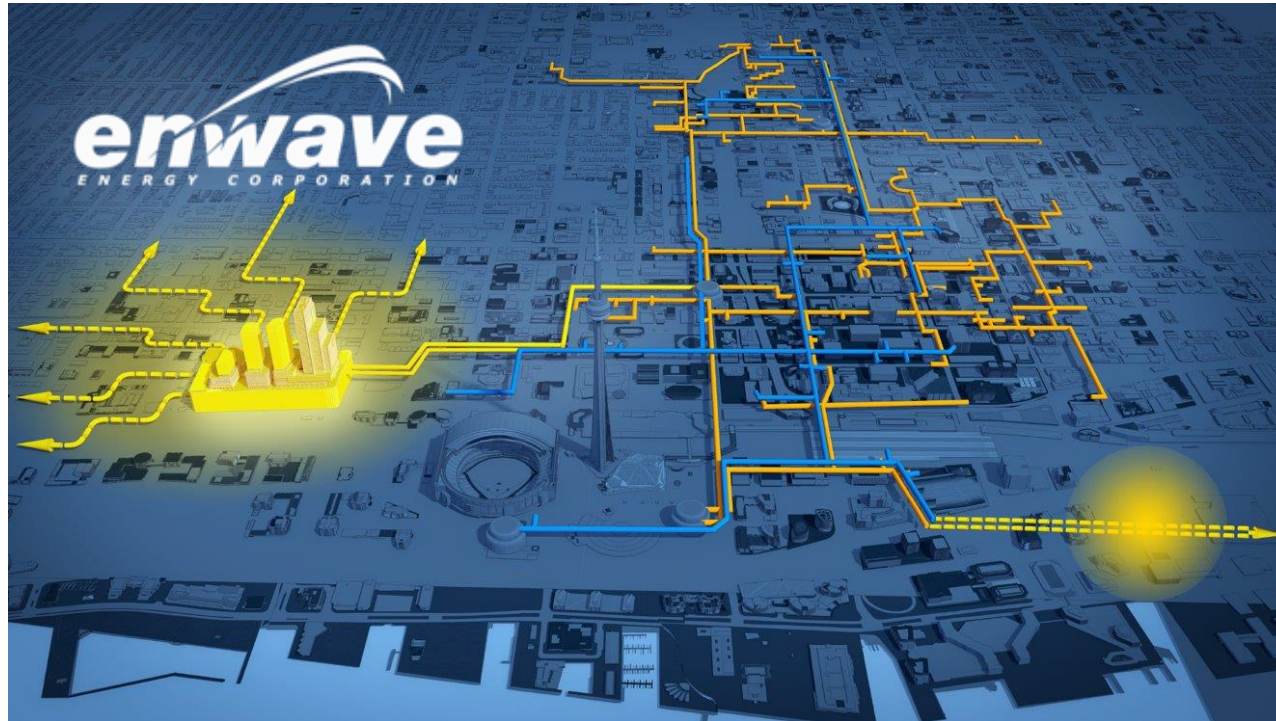


- Proposed product differentiation for low-carbon applications
- Underpinned by robust GHG accounting and 3rd party verification
- Leverage a range of low-carbon energy sources
- Both Steam and Hot Water
- Transferable to other markets in Ontario

Enwave Green Heat

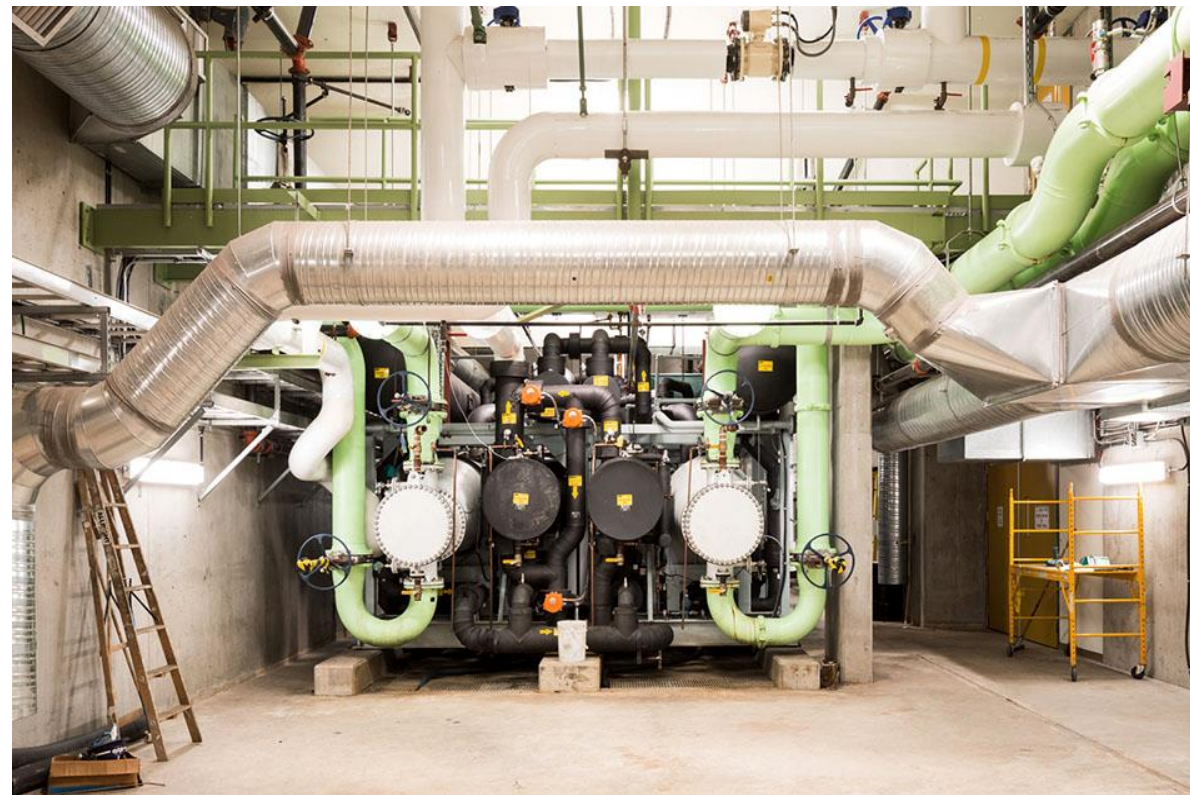


1. Policy and Customer driven
2. Enabling low carbon growth at scale
3. Supports all Ontario networks



Agenda

1. CoV False Creek Neighbourhood Energy Utility Overview
2. Green Heat Program
3. Future Plans



False Creek NEU



- Operational since 2010
- Owned & operated by CoV
- Financially self-sustaining
- Council oversight + Expert Panel
- 43 buildings connected (6.4M sqft)
- Target 70% renewable energy supply
- Commitment to develop a roadmap to transition to 100% RE by 2030

Green Heat Program Overview

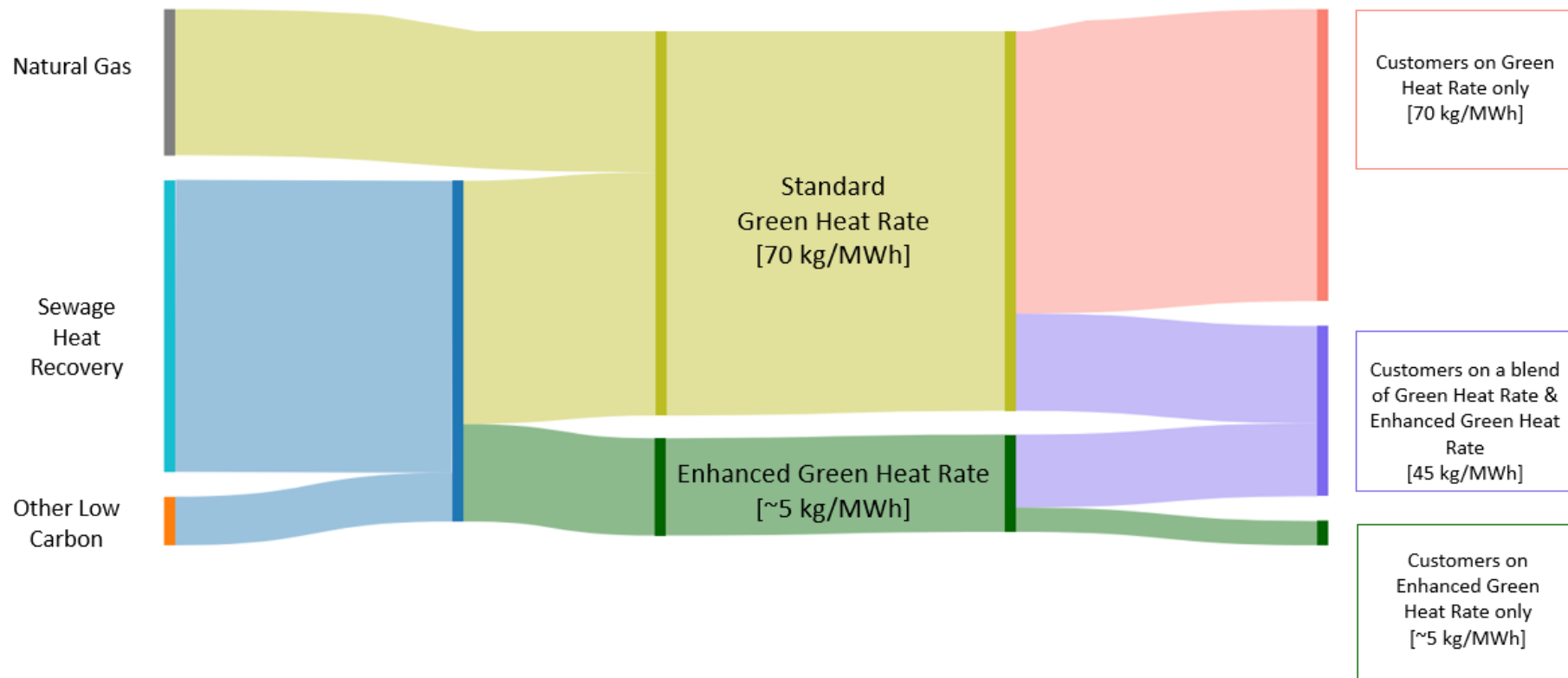
- The NEU currently offers a 70% renewable energy service to all customers
- What are the driving forces to provide a “greener” service offering?
 1. *Inquiries for voluntary subscription to a 100% RE service*
 2. *Increasingly stringent building-level GHGI limit requirements (i.e. Zero Emissions Building Plan, Vancouver Building Bylaw)*

Residential High-Rise Building Requirement	Building GHGi [kg/m2/yr]	Thermal Energy GHGi		Compliance [Y/N]
		Building Requirement [kg/MWh]	Average NEU Service [kg/MWh]	
Today	6	85	70	Y
2025	3	45	70	N

- Broader discussion among DE providers (BC Energy Step Code & BC Municipalities)

Green Heat Program Overview

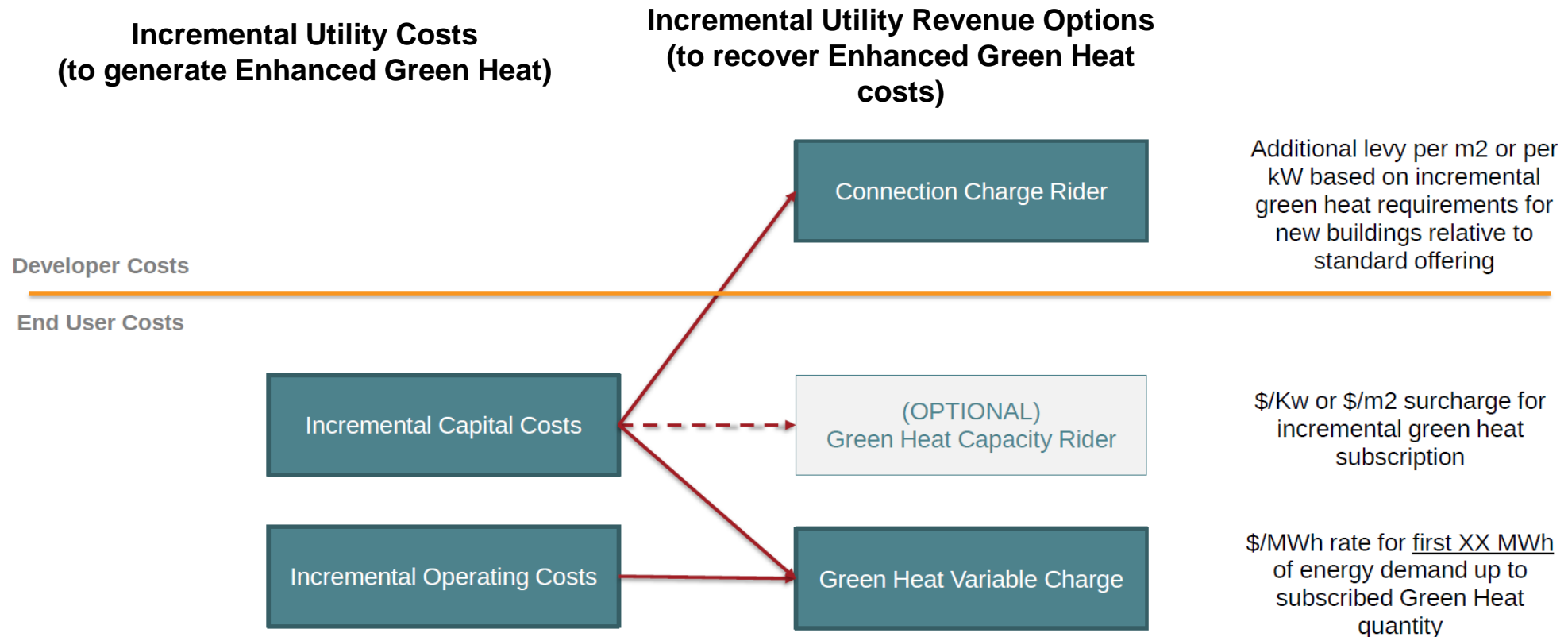
- Early direction is to have two rate offerings:
 1. **Standard Green Heat Rate** (i.e. NEU's current rate at 70% RE)
 2. **Enhanced Green Heat Rate**
- Buildings can subscribe to a blend of rates to align with their carbon requirements



Green Heat Program: Cost Recovery Options

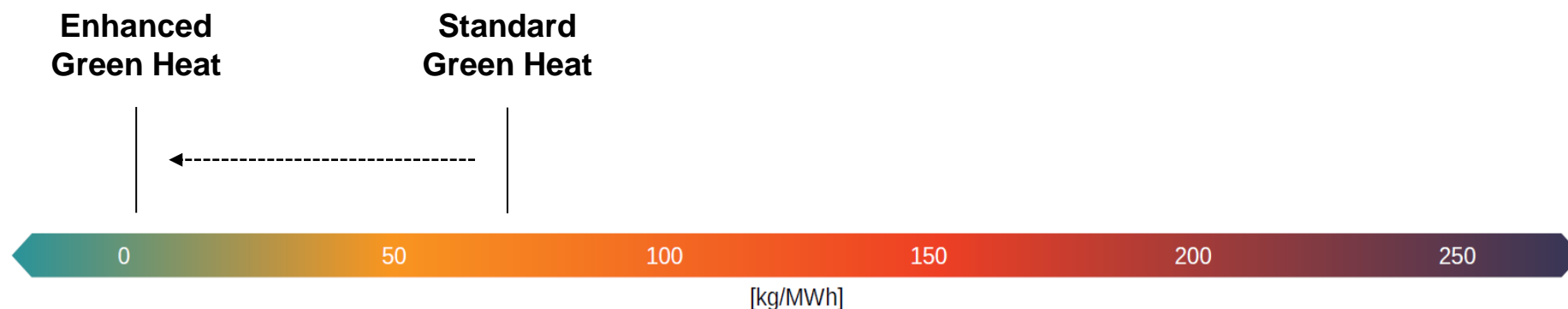


- Set connection charges and/or rates to recover **incremental costs** for providing Enhanced Green Heat
- Council-approved rate-setting principles



Future Plans

- NEU Decarbonization roadmap
 - Commitment to explore transition to 100% Renewable Energy (RE) by 2030
 - Standard Green Heat GHGI could move towards 100% RE over time



- Currently undertaking detailed Cost of Service Analysis & Rate review to inform implementation of long term Green Heat Program
- Exploring pilot program using RNG to meet incremental needs
 - Minimize complexity
 - Direct flow through of RNG cost as Variable Charge

Thank You!

Gerard MacDonald



Jason Brimble



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Speaking on behalf of Ashley St. Clair

