

# Renewable Solutions in Municipal DHW

## Surrey's Low-Carbon District Energy Strategy

IDEA Annual Conference

June 11, 2018

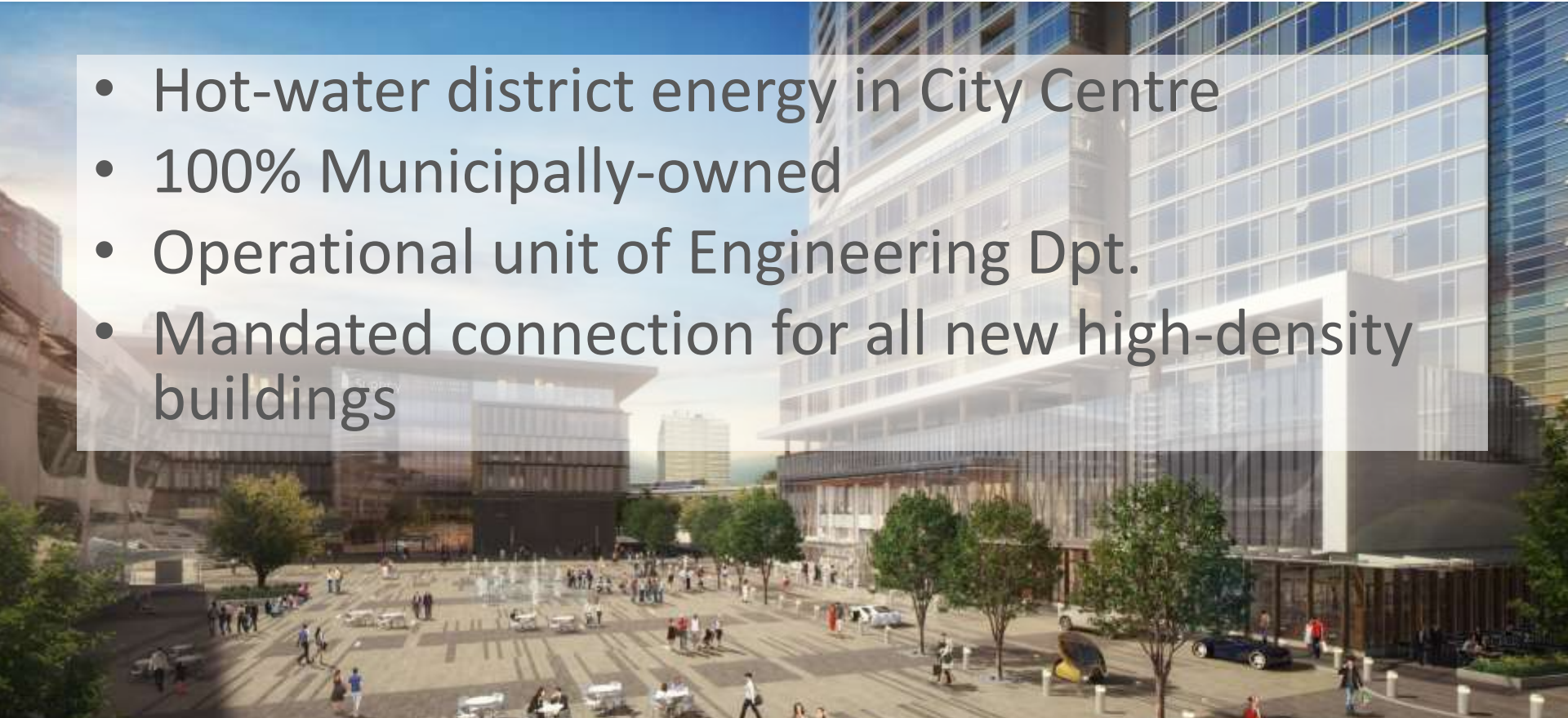


# Regional Context





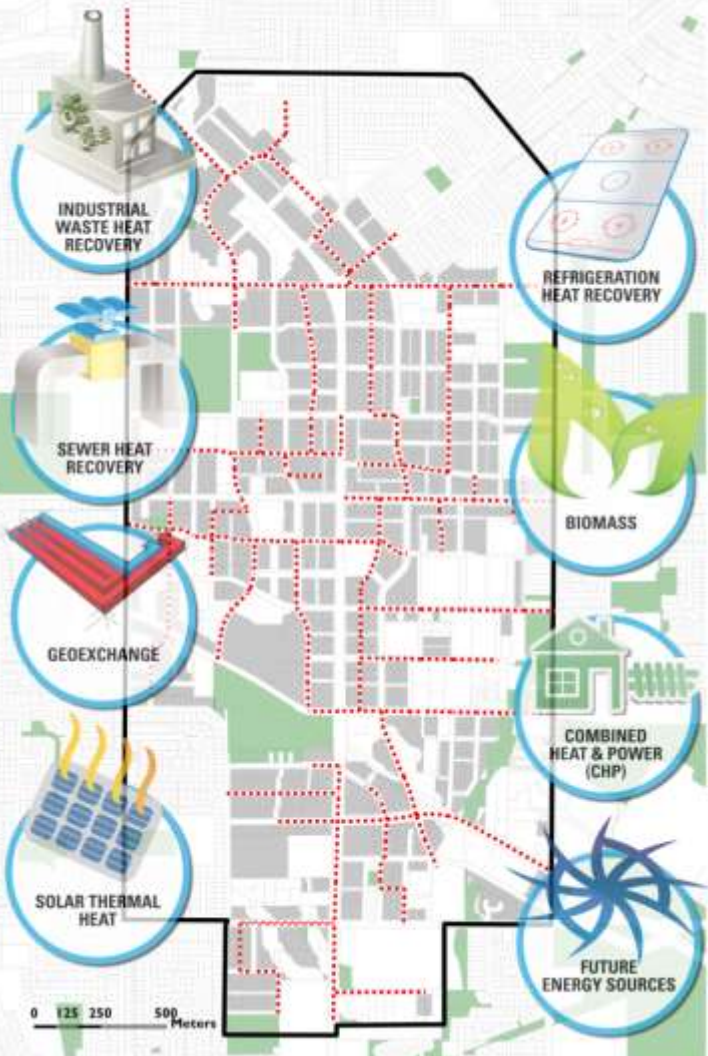
- Hot-water district energy in City Centre
- 100% Municipally-owned
- Operational unit of Engineering Dpt.
- Mandated connection for all new high-density buildings



DE Stats	2018	2035
Residential Customers	1,500,000 ft <sup>2</sup>	11,500,000 ft <sup>2</sup>
Commercial Customers	1,200,000 ft <sup>2</sup>	6,000,000 ft <sup>2</sup>
Peak Demand	12 MW	67 MW
Energy Sales	20,000 MWh	133,000 MWh







1. Improve energy efficiency;
2. Reduce greenhouse gas emissions;
3. Increase resilience; and
4. Provide competitive and stable pricing.



## Phase 1

Temporary Energy Centres



## Phase 2

Permanent Energy Centre



## Phase 3

Low-Carbon Energy

# Phase 2: West Village Park & District Energy Centre



# Phase 3: Integrating Low-Carbon Energy

## GHX/RNG



## Biomass



## Sewer Heat





# City Hall GHX



- 10,000 m<sup>2</sup> (108,000 ft<sup>2</sup>) footprint
- 389 Boreholes, average depth = 60m (197 ft)
- Residual heat from GHX distribute to adjacent DE customer (approx. 1,100 MWh/yr)

# Surrey Biofuel Facility



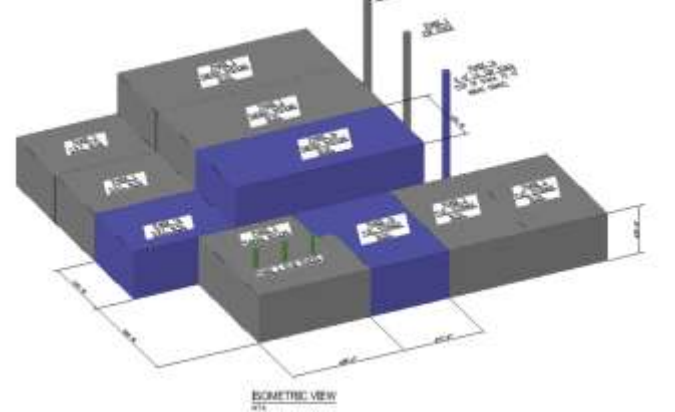
- 115,000 metric tons of organic waste diverted from landfill/year
  - Renewable Natural Gas: ~120,000 GJ/y
  - Grade A Compost: 40,000 to 50,000 MT/y
- City secures long-term fixed price certainty on organic disposal rate and RNG source
- City fleet will run on 100% RNG
- Residual RNG (approx. 25,000 GJ/yr) will be used for DE





# Phase 3 - Biomass

	Phase 1	Phase 2
Output Capacity	9.8 MW	19.6 MW
Low-Carbon Energy	48,950 MWh	97,900 MWh
Biomass Input	13,000 BDT/yr	26,000 BDT/yr



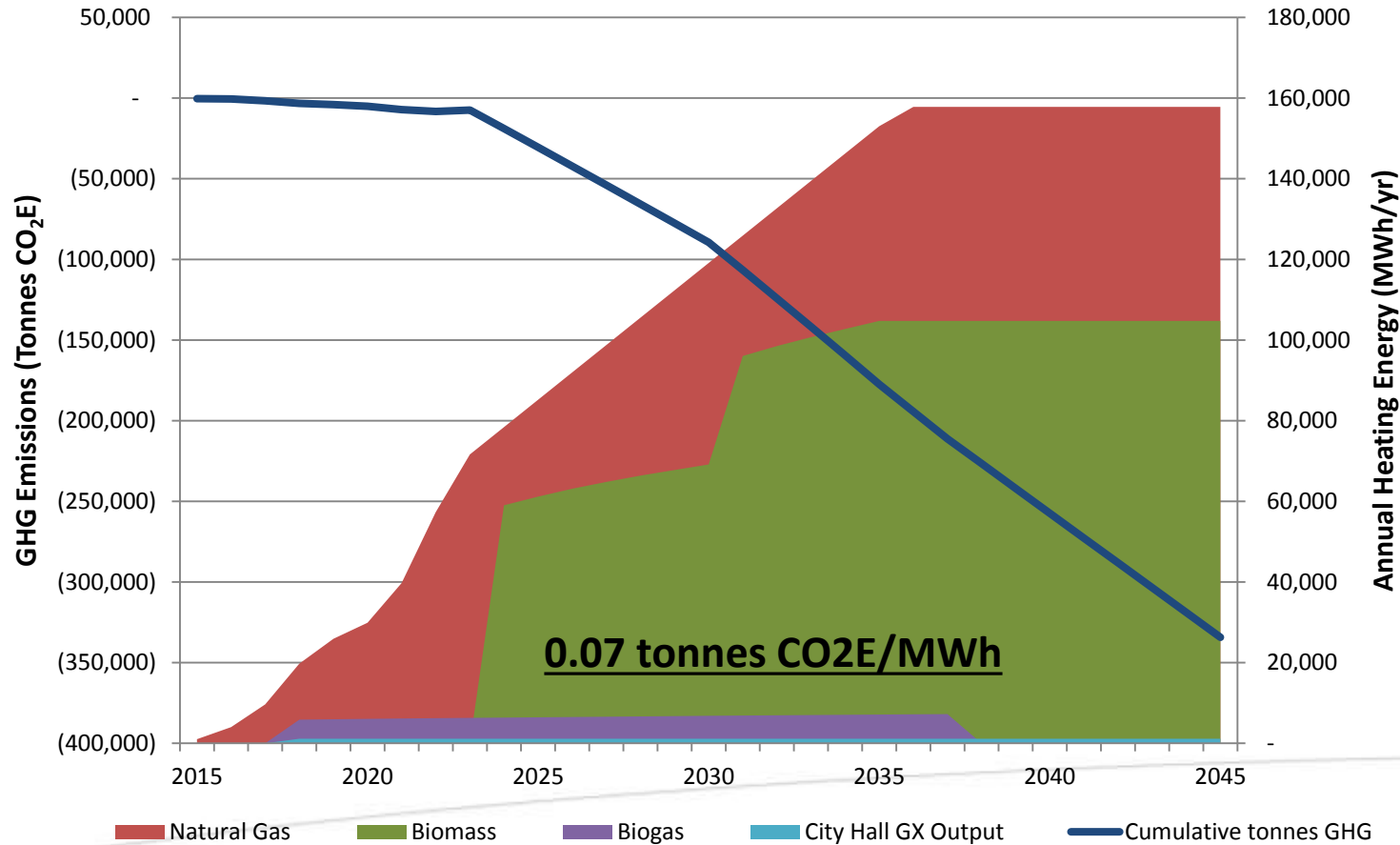
# Phase 3 – Waste Heat Recovery

	Phase 1	Phase 2
Output Capacity	9 MW	15 MW
Low-Carbon Energy	46,199 MWh	76,789 MWh
Sewage Diverted	250 l/s	416 l/s





# Low-Carbon Outcomes



# Key Takeaways

- Surrey is using DE as a platform for the use of locally available low-carbon heating sources
- This strategy will result in significant GHG reductions while improving energy resilience and stabilizing long-term energy costs in Surrey
- Diversity and flexibility of heating sources are key to success



# Thank You.



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