PRESNTATIONS

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Building to Net-Zero Community of Practice

Thermal Energy Networks: How cities are turning waste into warmth

DOWNLOAD

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LA BOUCLE ÉNERGÉTIQUE COLLECTIVE

Saint-Laurent Energy Loop: Blueprint for Collective Innovation

A reproducible model for territorial energy transition.

Sylvain Foulon
Commissaire en développement durable
Sustainable Development Commissioner
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sylvain.foulon@excellence-industrielle.ca

A project led by Excellence industrielle Saint-Laurent (EISL) with the support of the Green Municipal Fund and its partners.

Who and where are we ?

Saint-Laurent Montréal

Economic Development Service incorporated as a non-profit organization

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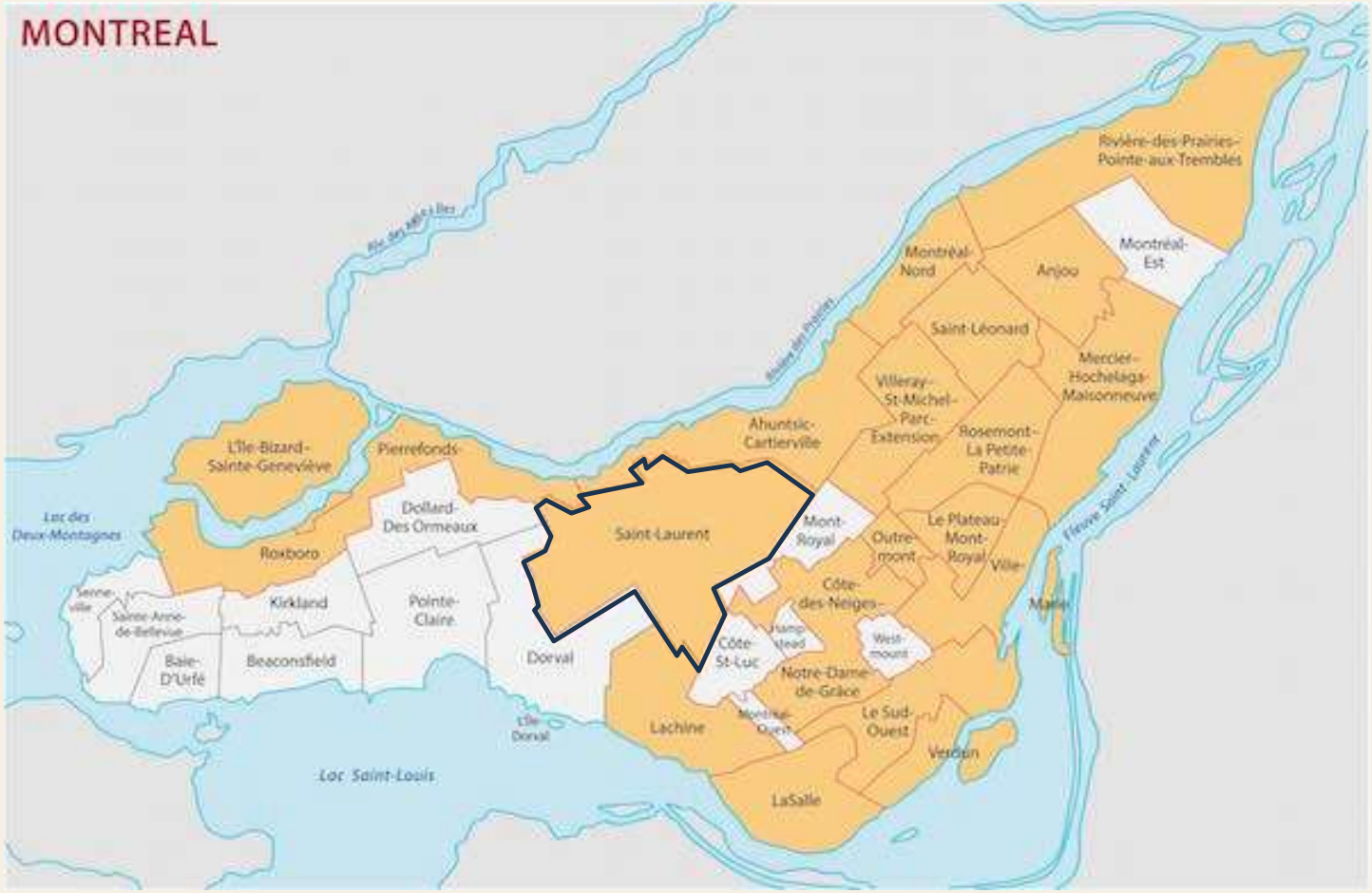

An Industrial Territory Facing the Climate Emergency

The Saint-Laurent industrial park is a major economic engine, but also a massive pole of energy consumption. Faced with the targets of the Climate Emergency Plan, inaction is not an option.

The Context

4,400 businesses: A dense concentration of varied energy profiles.

-55% GHG emissions: The borough's ambitious target for 2030.

Untapped Potential: A widespread lack of awareness regarding individual consumption and waste heat.

The Opportunity

- Transform a group of isolated actors into a collaborative energy ecosystem.
- Turn waste heat into a valuable local resource.
- Create a model for industrial decarbonization at the municipal scale.

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Transforming Waste Heat into a Shared Resource

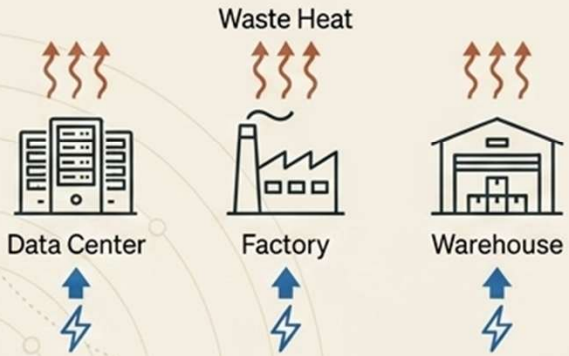
The Statistical Reality

34% of the energy consumed in our industrial parks is lost as heat. It is a massive waste, vented onto roofs and into the environment.

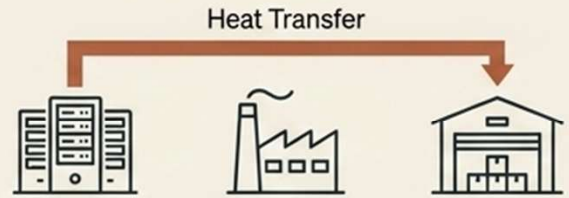
The Loop Principle

Companies that produce unused heat become suppliers, while those that need heating become receivers. This is energy circularity.

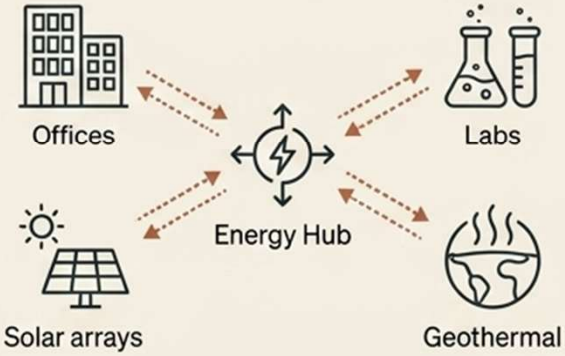
1. Current Situation



2. Local Network



3. Intelligent Collective Loop



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The First Infrastructure Was Human, Not Technical

The Birth of the Collective

- The project began by forming an **advisory committee** bringing together multiple perspectives: energy experts, industrial representatives, urban planners, and regulators.
- **Founding Principle**: Participation was voluntary, unpaid, and based on the shared conviction that collaboration was the only path forward. Participating in a collective exploration.

The Framework of Trust

- Clear rules were established: respect, neutrality, confidentiality, and the right to experiment.
- This space transformed a group of experts into a community of explorers.

"Bonds of trust, invisible in spreadsheets and diagrams, are what make the collective vision possible. Without them, project would have remained a well-designed idea. Thanks to them, it began to come to life."

— Sylvain Foulon

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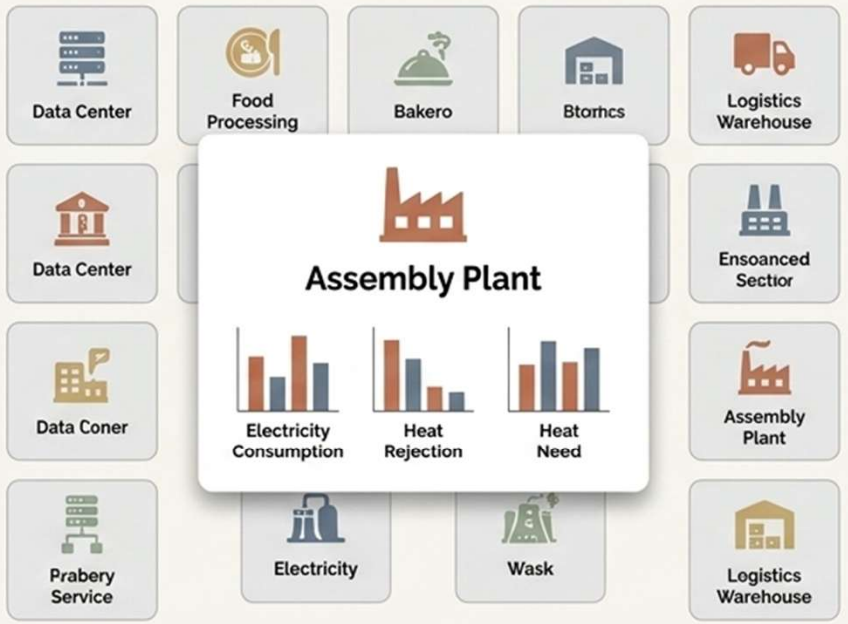
From Data Chaos to Archetype Clarity

The Initial Challenge: How do you analyze the energy profiles of over 4,400 companies? The initial collection generated an ocean of disparate and incomplete data.

The Methodological Solution: The creation of 14 energy archetypes. These standard profiles modeled the park's energy behaviors (needs, waste, cycles), turning raw numbers into factory stories and making potential synergies tangible.

Data Chaos

Archetype Clarity



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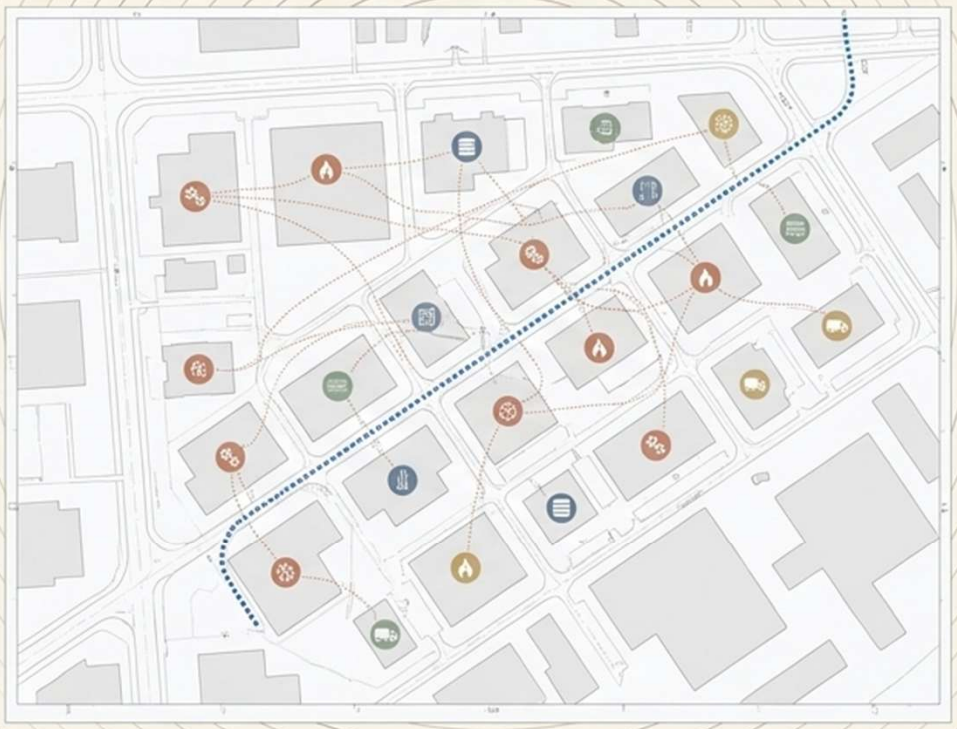
Making Synergies Visible Through Spatial Mapping

The Approach

By superimposing the archetype energy data onto a map of the industrial park, a portfolio of synergies appeared. Mapping allowed the transition from abstract analysis to spatial planning.



The Discoveries

- 23 concrete synergy opportunities were identified.
- Logical patterns and clusters emerged from the chaos of multi-colored icons.
- **The Pivotal Moment:** The discovery of an existing underground gallery, perfectly aligned with an optimal network route. The urban infrastructure became an ally.

Moving from Intuition to Decision with a Feasibility Study

The Key Moment

To move from possible to viable, an independent study was necessary to answer: where, how, and under what conditions can a loop emerge?

Crucial Financial Leverage

$75,000 in support from the Green Municipal Fund, backed by Hydro-Québec. This allowed mandating specialized firms Énergère and Altanergy for rigorous analysis.

The Results

- Techno-economic validation of synergies across the 3 sectors.
- Credible modeling prioritizing investments and expected gains.
- Production of a realistic roadmap, turning vision into an action plan.

"When I held the final report in my hands, [...] the collective vision ceased to be fragile: it became shareable, transmissible, and credible." — **Sylvain Foulon**

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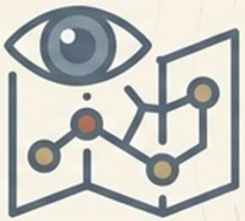
Lessons Learned: The Three Pillars of a Successful Transition

1

Learn to Collaborate

Cooperation is not automatic; it is learned. It requires time, neutral spaces, and a trusted third party (the role of EISL) to build voluntary commitment.

2



Learn to Know

Without shared data, there is no lasting collective action. The creation of archetypes and spatial mapping were essential tools for creating common knowledge.

3

Learn to Govern

Territorial transition demands clear rules of the game and evolving governance. Roles, responsibilities, and decision-making mechanisms must be defined from the start.

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The Result: More Than a Loop, A Reproducible Blueprint

Quantified Impacts (Study Targets)

+8,000 tonnes of GHG reduced annually (potential).

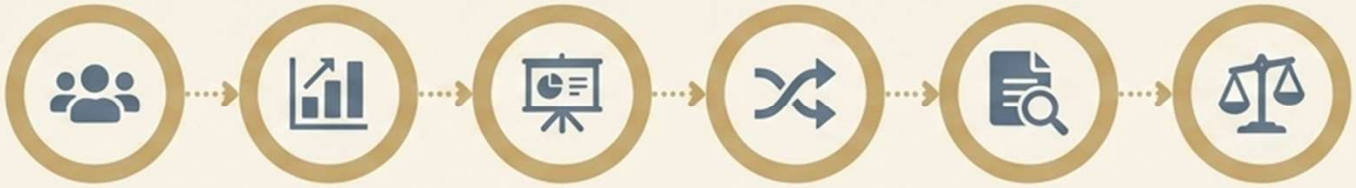
-$3/GJ: Target of energy costs below fossil fuels, boosting competitiveness.

Energy Resilience reinforced for the entire territory.

The True Product

The project generated a clear, proven procedure for collective energy innovation.

"The Saint-Laurent energy loop is no longer a hypothesis: it is a promise. [...] A model that now allows others to move faster."



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The Future of Territorial Energy is Written Together

The Next Step: Phase 2

Moving from design to action.

Objective: Co-design the first collective energy network of the industrial park alongside a distributor-partner.

A Cultural Transformation

This project proposes a new way of doing business: moving from a juxtaposition of isolated actors to a cooperative ecosystem.

The energy transition cannot be imposed; it is learned through trust, rigor, and cooperation.

"I look at the path we've traveled, and I see more than a loop. I see human energy, collective intelligence, an ability to believe that change is possible. [...] If Saint-Laurent could initiate this movement, then others can too."

— Sylvain Foulon

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An Ecosystem of Engaged Partners

This project is the result of a human adventure and exceptional collaboration between the public, private, and academic sectors.

Key Financial & Institutional Partners

Saint-Laurent Montréal

FONDS MUNICIPAL VERT

Hydro Québec

Fonds Climat du Grand Montréal

The Project Driver

Excellence industrielle Saint-Laurent

Technical Partners

ENERGERE A GDI AINSWORTH COMPANY

ALTANERGY GROUPE

The Pioneer Companies

YKK, Vantage Data Centers, Cologix, Lufa Farms, Grifols, Vapor Rail.

The Advisory Committee

An acknowledgment of the volunteer experts who guided the vision.

BUILDING DECARBONIZATION Alliance

An initiative of The Transition Accelerator

Thermal Energy Networks in Canada

From Insight to Action

September 24, 2026

Aurélie Vérin,
Policy Lead - Building Decarbonization Alliance

About the BDA

Positioning buildings as the **foundation** of Canada's **electrified economy**

Who We Are

An initiative of *The Transition Accelerator*: **foundation-funded**, independent

350+ partners across the ecosystem

Pan-Canadian, helping bridge regional & sectoral silos

***Smart* building electrification** is key to Canada's economic competitiveness, affordability, and energy security

What we do

Inform the Path Forward

Mapping the strategic direction and policy architecture and inspire industry and government leadership

Catalyze Ecosystem to Act

Building *partner-grounded* insights, tools, and coalitions that help unlock durable market transformation

What are Thermal Energy Networks?

Shared piping infrastructure that connects multiple buildings, and thermal sources, together.

District Energy
4th generation

Ambient Loops
5th generation

Centralized	⇆	*Decentralized*
Medium temperature	⇆	*Ambient temperature*
Direct heating & Cooling	⇆	*Thermal source and sink*

TENs in Canada: Where We Stand

Setting the Stage

1. ### A growing, municipal-led network

   250+ TENs projects already operate in Canada, serving roughly 3% of national heating demand.

2. ### Different policy environment

   Regulated vs. market-led approach.

3. ### A viable path to decarbonization

   Gowing exploration of alternatives to conventional heating and cooling.

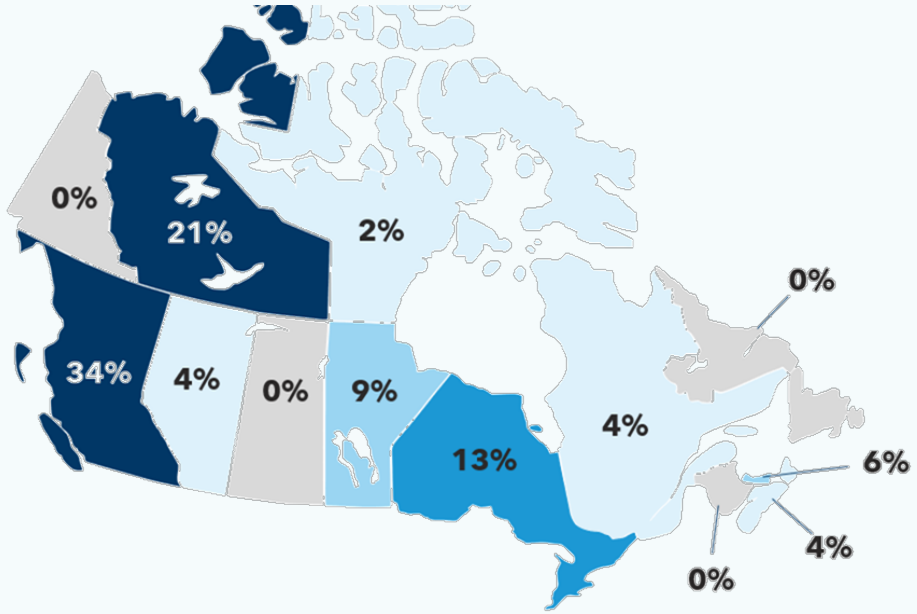


Figure: Completed TENs Projects (% of National Total) per Province Since 2010

Two TENs Initiatives

TAF-funded 2-year project

*What is the current **State of Play** across Canada?*

*What TENs configurations deliver **sufficient system benefit to justify** the investment and effort – and where?*

*What **decision support tools** and **draft policies** should we develop to support the industry & policymakers?*

OERD-funded 3-year project

*When, where and how could **existing utilities** play a larger role?*

*How should provinces mandate their **regulators** to oversee thermal energy?*

From insights to action

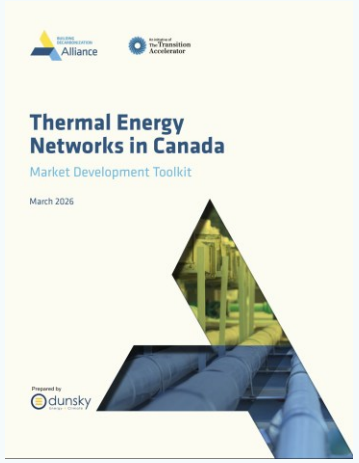
The TENs Support Toolkit

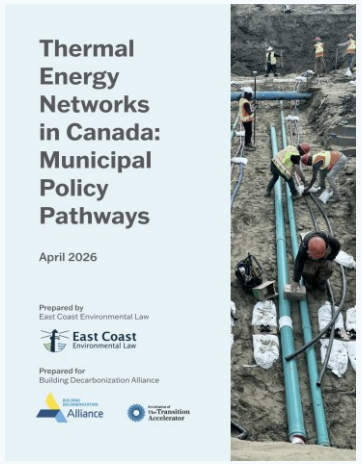
1. **Market Development Toolkit**
   Stakeholder roles, site screening, business case and rate design across a TEN's development.

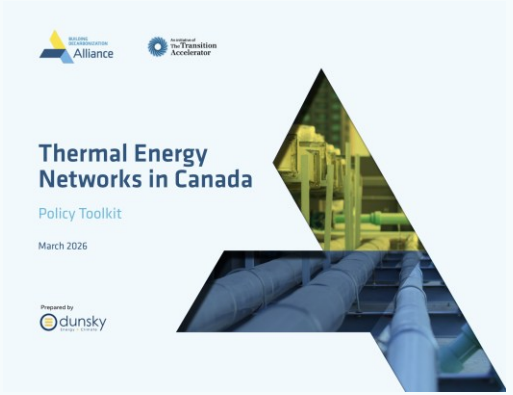
2. **Policy Toolkit**
   Five high-impact policy lever, outlining the rationale and potential impact of the policy.

3. **Municipal Policy Pathways**
   Where municipal authority can enable TENs, with prototype policy statements and municipal bylaw language.

4. **Opportunity Scorecard**
   A structured tool to quickly assess a project's viability before detailed feasibility work.







Why do TENs matter?

Decarbonization at scale

Retrofitting building by building is slow and costly.
A TEN decarbonizes a whole district at once.

Grid relief

Shared loops shave winter peaks — easing the grid upgrades your growth and housing plans depend on.

Waste heat recovery

Sewers, data centres, arenas, industry: heat your community already produces, and today throws away.

Gas transition pathway

Gas utilities can shift from moving gas to moving heat — which can make them a partner in your plans.

What is holding TENs back?

Upfront economics

TENs need more upfront capital than gas-fired standalone systems.

→ **Opportunity:** Public buildings as anchor loads, coordinated capital planning, and stacked senior-government funding all improve the business case.

Market uncertainty

Will the network be ready when buildings need it? Can promoters secure firm load commitments?

→ **Opportunity:** Growth areas, rezonings and development approvals are a clear signal of future load for a promoter.

Who leads?

TENs involve municipalities, utilities, developers and customers — success depends on a clear champion.

→ **Opportunity:** Municipalities can act as a convener in the room, even when they do not own the system.

Catalysing Growth: **Proposed Framework**

1. Level the TEN playing field

Ensure that TENs receive the same regulatory and financial treatment as electricity and gas infrastructure

Tilt the playing field towards decarbonization

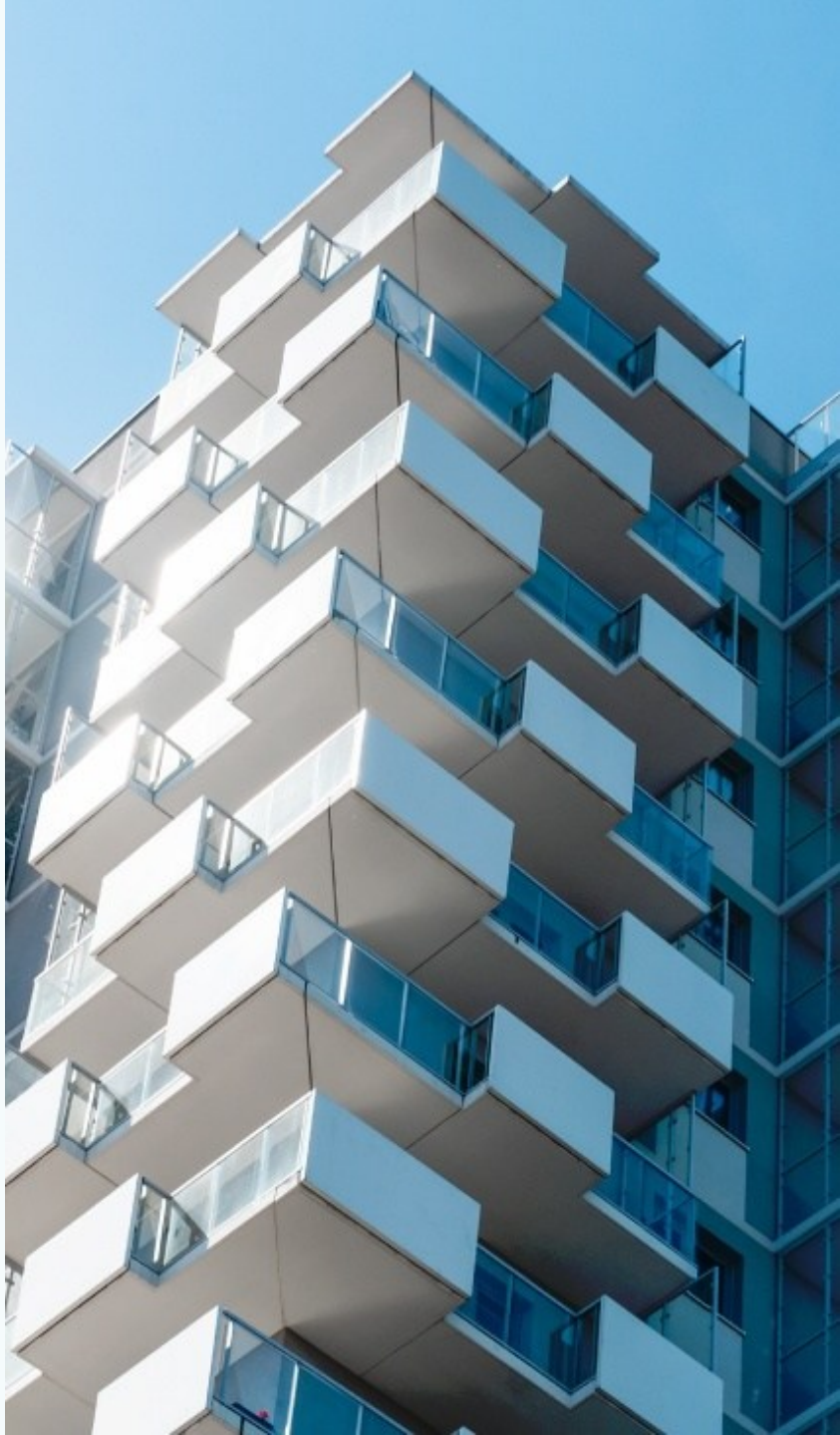
2. Let strategic TEN opportunities emerge

Area-based, integrated clean heat planning to prioritize how and where to deploy TENs and other solutions to provide the most value to communities

3. Unlock TEN delivery at scale

Targeted enabling strategies & policies to support deployment: connection bylaws, de-risking mechanisms, partnerships & collaboration, education & capacity building

Assess whether and how thermal energy should be regulated



Thank you!

For more information, please contact:

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Policy Lead – Building Decarbonization Alliance
averin@transitionaccelerator.ca

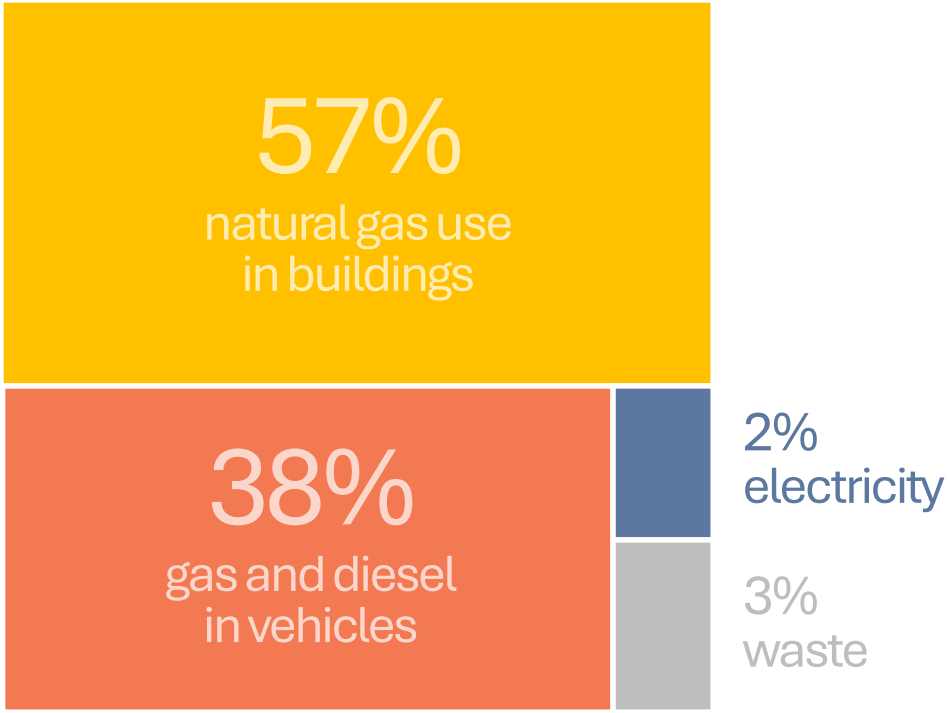
How the Neighbourhood Energy Utility Helped Transform Wastewater into an Energy Resource for the Region

CITY OF VANCOUVER | CLIMATE EMERGENCY

Neighbourhood Energy Utility ("NEU") Overview

- **Ownership:** Owned and Operated by the City of Vancouver
- **Purpose**: Reduce GHG emissions via financially self-sustaining district heating network delivering cost-effective low-carbon thermal energy
- **Operational Since:** 2010
- **Current Environmental Performance:** 70% Renewable Energy
- **Climate Emergency Target:** 100% Renewable Energy by 2030

Vancouver's carbon pollution in 2024



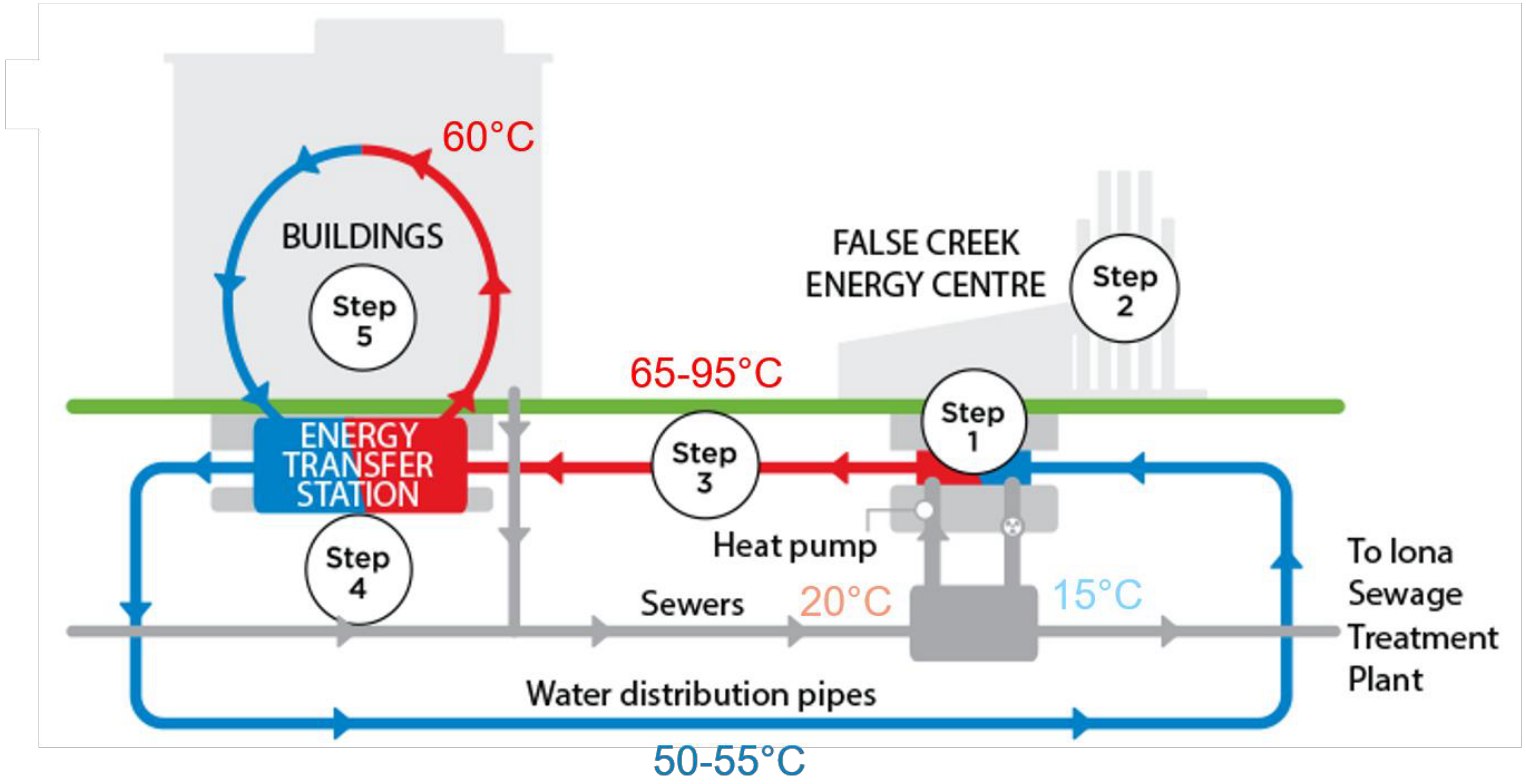
Community-wide emissions, 2024

(GPC Basic, Scopes 1 and 2 + Scope 3 Waste. Due to rounding, percentages may not add up to exactly 100%.)

CITY OF VANCOUVER | GREENEST CITY 2020

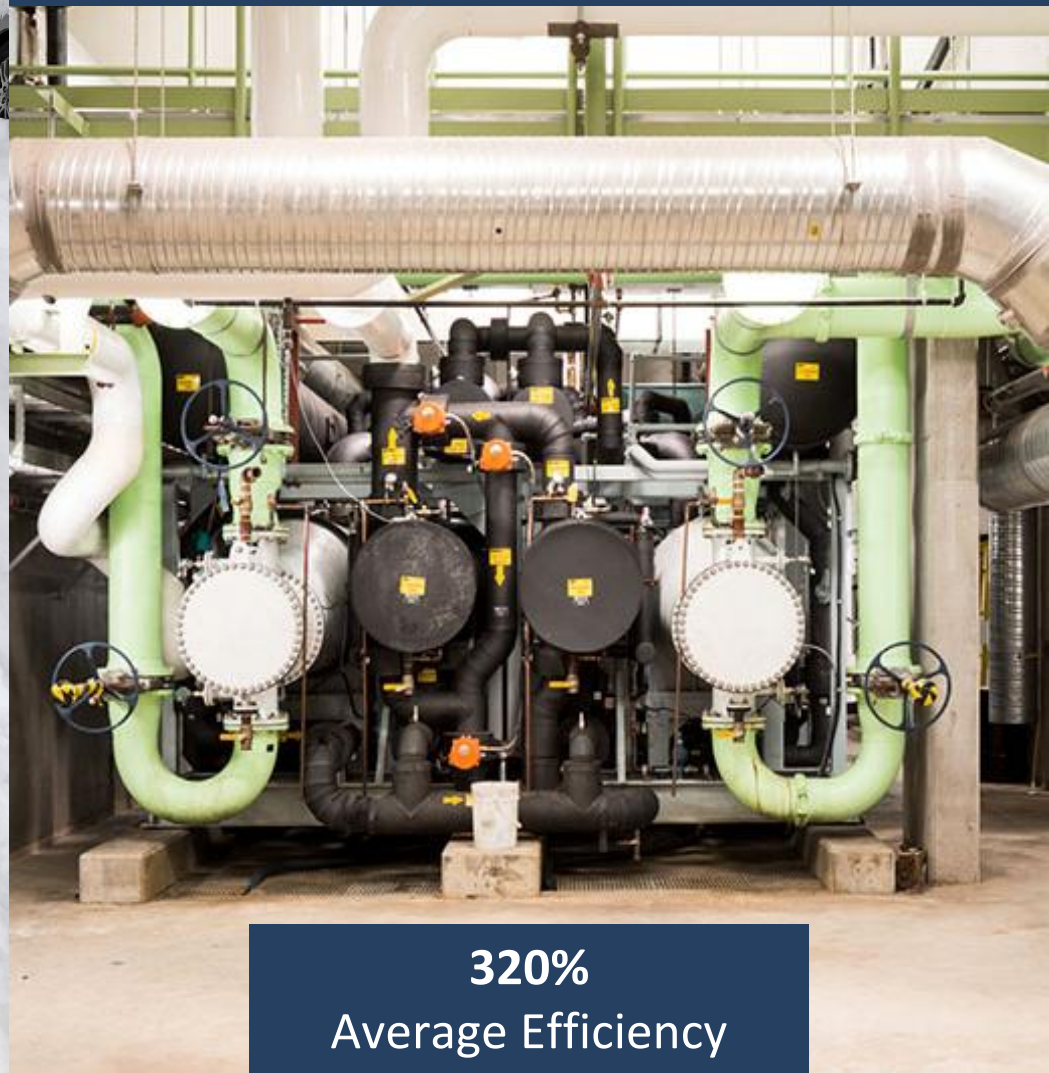
How the Neighbourhood Energy Utility Works

We Turned Sewage into an Energy Resource for the Community



Sewage Heat Recovery

2010
First Sewage Heat Recovery Facility in North America



320%
Average Efficiency

Benefits of District Energy

CITY OF VANCOUVER

Climate Leadership

Local Renewables

Competitive Rates

Reliable & Resilient

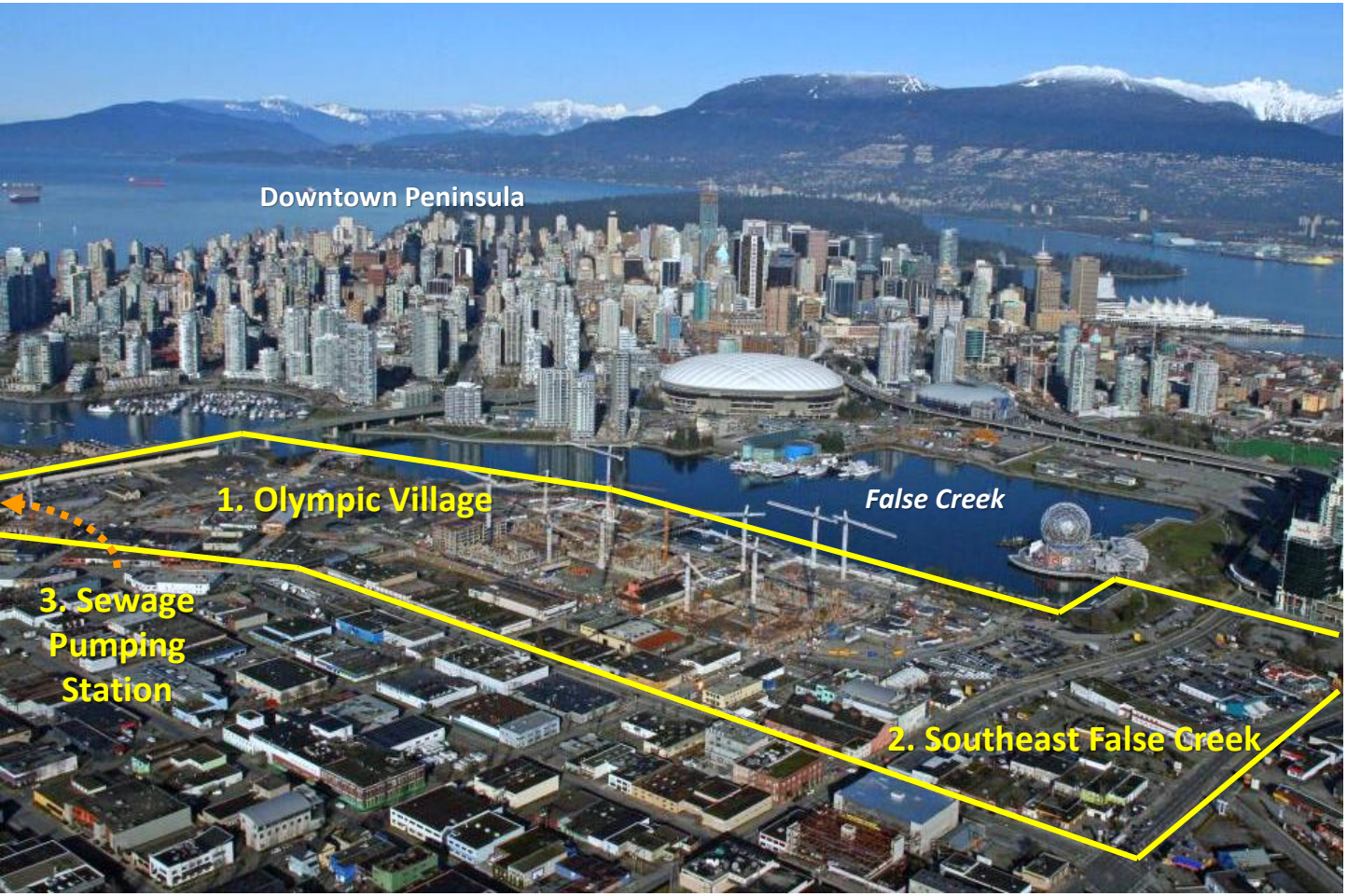
Streamline Development

Support Building Retrofits

Flexible to Emerging Tech

Reduce Burden on The Grid

How it Started



Conditions Supporting District Energy:

1. Anchor Load: *Olympic Village*
2. Density: *Southeast False Creek*
3. Local Waste Heat Resource: *Sewage Pumping Station*

Where we are Today

2024 Sewage Heat Recovery Expansion Project

Project Scope

1. **Heat Pumps:** Install two new 3.3 MW units to complement the original 3.2 MW unit
2. **Sewage Screening:** Modernize sewage screening to reduce water consumption and improve resiliency

Project Outcome

Tripled low-carbon capacity from 3.2 MW to 9.8 MW

Delivery to the False Creek Energy Centre

Heat Pump Advancements

1. **Smaller Footprint:** Two new heat pumps fit within the original heat pump footprint
2. **Higher Avg COP:** Improved from 3.2 → 3.6

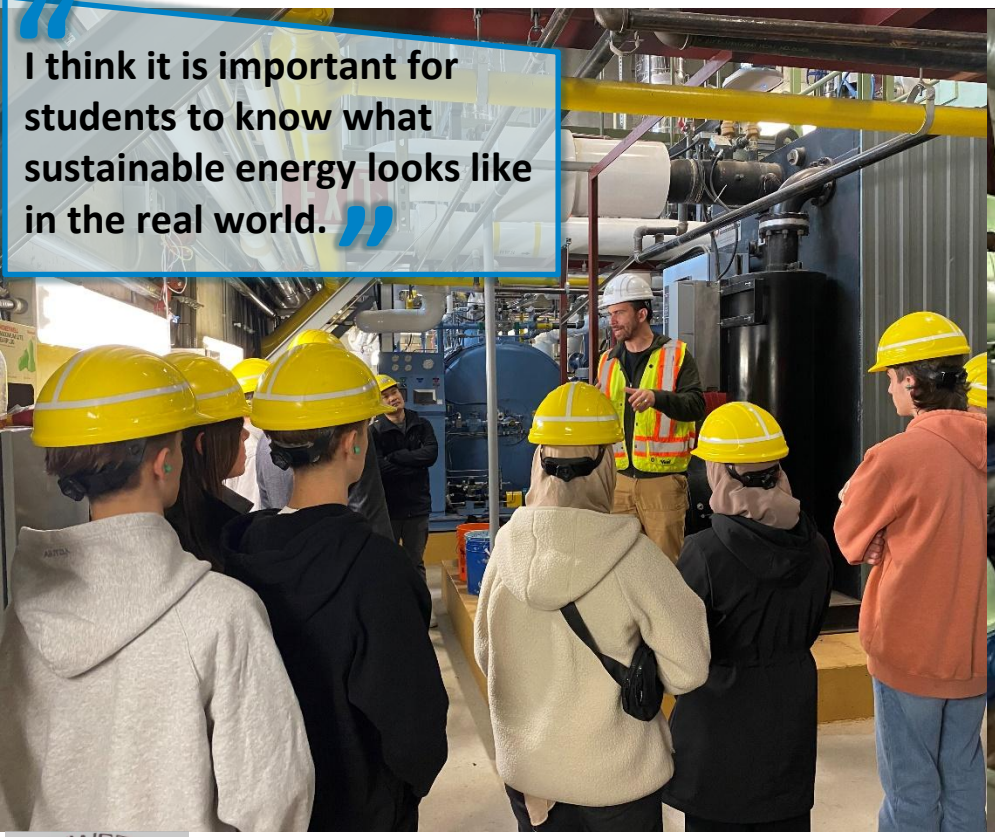
Original 3.2 MW sewage heat pump

2024 expansion: two 3.3 MW sewage heat pumps

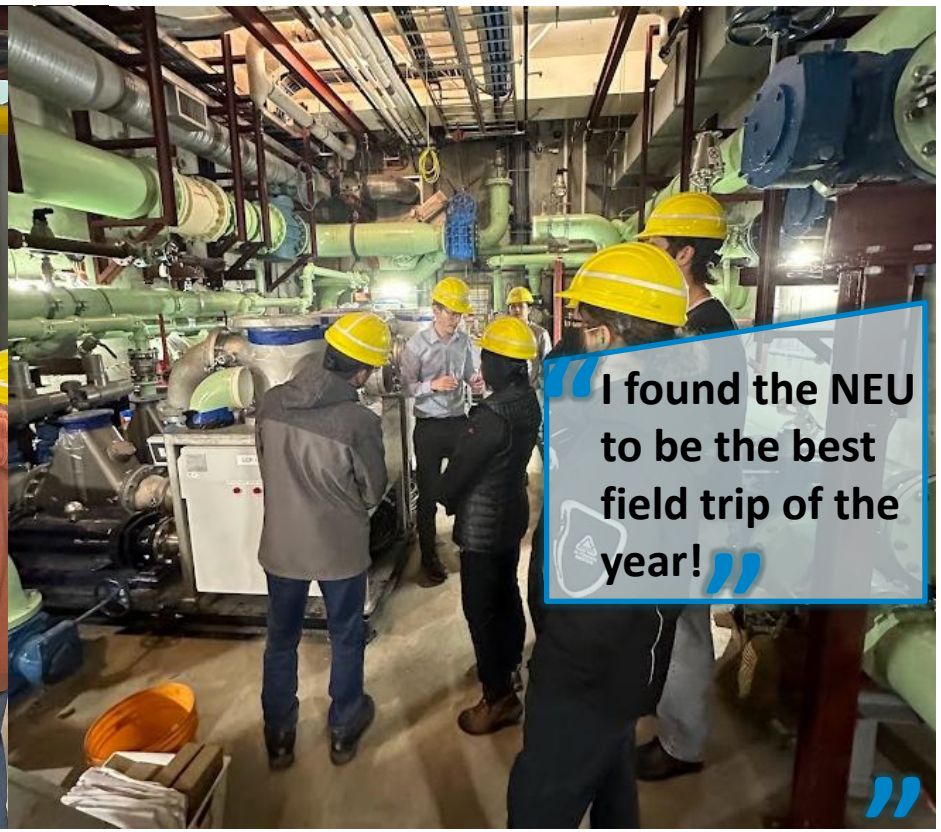
Activating the Energy Centre as a Learning Hub

CITY OF VANCOUVER

SCIENCE WORLD | BCIT | VCC | SFU | UBC | UNIVERSITY OF GEORGIA | COLLEGIUM VANCOUVERIENSIS 1922 | SIMON FRASER



"I think it is important for students to know what sustainable energy looks like in the real world."



"I found the NEU to be the best field trip of the year!"

KWIKWETLEM FIRST NATION | City of Burnaby | PORT MOODY City of the Arts | NEW YORK CITY COUNCIL | WATER RESOURCES AUTHORITY MASSACHUSETTS | WOMEN4CLIMATE | aee Association of Energy Engineers | INDIGENOUS CLEAN ENERGY

District Energy - 2010

*Have selected sewage heat recovery as primary source of energy

District Energy - Today

*Have selected sewage heat recovery as primary source of energy

Reimagining How we View Waste

BBC NEWS

The neglected clean heat we flush down the drains

By Anna Turns
3 January 2024

Bloomberg

How Sewage Is Helping Along the Energy Transition

Cities, utilities and buildings are increasingly turning to some unlikely renewables to reduce fossil fuel emissions.

By William Ralston
1 May 2024

THE WALL STREET JOURNAL.

We're Flushing a Lot of Energy Down the Drain. Can We Capture It?

By Jackie Snow
19 April 2025

VANCOUVER IS AWESOME

Metro Vancouver college to use 'holy grail of sewage pipes' to heat campus

CITY OF VANCOUVER

We Turned Local Waste Heat into Lasting Community Infrastructure

Reliable. Resilient. Efficient. Cost-effective. Low-carbon.

A Model for Sustainable Development

Thank You!

Questions?