


CAPE BRETON
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Cape Breton
Partnership

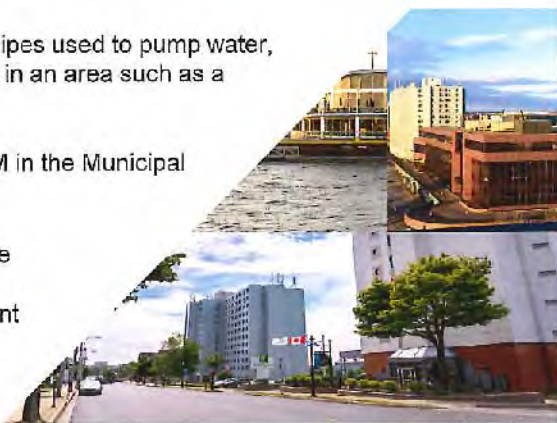
Downtown Sydney District Energy

1

Downtown Sydney District Energy

Background

- District Energy (DE) is a system of underground pipes used to pump water, used for heating and cooling, to multiple buildings in an area such as a downtown district
- First identified as a potential opportunity for CBRM in the Municipal Climate Change Adaptation Plan (2014)
- Preliminary study in 2019 showed that DE could be financially viable and have positive environmental impacts, but further analysis required for investment
- CB Partnership commissioned detailed study in 2020/21, with work recently completed




2

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Project Goals

- Improve environmental performance of buildings' heating and cooling systems.
- Ongoing operational cost savings to customers.
- Green economy jobs
- Stable, long-term, alternative revenue generation for CBRM


7 AFFORDABLE AND CLEAN ENERGY




9 INDUSTRY, INNOVATION AND INFRASTRUCTURE




11 SUSTAINABLE CITIES AND COMMUNITIES




13 CLIMATE ACTION





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3

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Alignment with Council's Economic Development Strategy



- CBRM Forward economic development consultants and technical advisory committee (TAWG) members have been kept well informed of this project from the beginning of the CBRM Forward Initiative.
- In addition, this project is in alignment with Council's strategic direction of pursuing new revenues in addition to property taxes.
- The **CBRM's Economic Development Strategy** remains on track to be completed this fall, through the CBRM Forward initiative.



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4

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Technical Analysis

Wastewater Energy Recovery	Ground Source Geothermal
<ol style="list-style-type: none"> 1. Easily accessible 2. Abundant 3. Already "owned" by CBRM 4. Free, renewable source of thermal energy 	<ol style="list-style-type: none"> 1. Local geology is very suitable for geothermal heat exchange 2. Higher demand for heat requires more space for bore wells
Harbour Water Energy Recovery	Biomass-based Heating
<ol style="list-style-type: none"> 1. Great source of cooling, but very limited heat available in winter months 	<ol style="list-style-type: none"> 1. Abundant source material available through solid waste 2. Would require combustion and associated emissions in downtown core 3. Would not address cooling needs

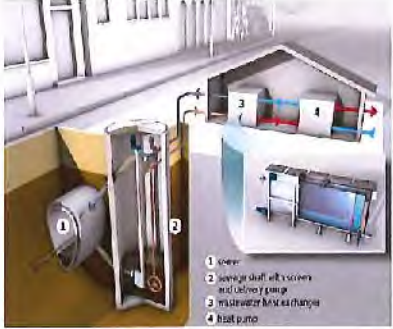





5

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Technical Analysis – Wastewater Energy Recovery

- Closed loop system (no odors)
- Sewer access equipment would be completely underground
- Heat recovery uses established technology, heat exchangers and heat pumps. Same equipment used to make C200 ice and heat arena



6

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Technical Analysis – Distribution System

- Insulated pipes installed within public right of way
- Two pairs of hot and chilled water (Supply and Return for each)
- ~1500m of piping for main distribution system
- System sized to allow future expansion



Phase 1
Possible Future Expansion



7

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Environmental Analysis – Wastewater Energy Recovery

- System will eliminate fossil fuel combustion at customer buildings entirely
- System will utilize on-site renewable electricity generation and storage
- 75% GHG reduction for participating buildings by using grid electricity. Reductions increase further with installation of on-site solar generation
- 4,820 tons CO2 emissions eliminated annually

UNIT (30 YEAR PROJECT LIFE)	BUSINESS AS USUAL BASE CASE	GRID SUPPLIED DISTRICT ENERGY SYSTEM	DISTRICT ENERGY WITH SOLAR PV
Electric Consumption (mWh)	19,007	9,602	2,633
Fuel Consumption (MMWh)	52,132	0	0
Elec GHG Emissions (tonnes)	75,854	46,762	34,501
Fuel GHG Emissions (tonnes)	115,504	0	0
Total Emissions (tonnes)	191,358	46,762	34,501
GHG Emission Savings (tonnes)	0	144,596	158,757




8



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Financial Analysis – Wastewater Energy Recovery

- Full Class D capital budget estimate of **\$37,920,000** (includes HST and contingency)
- System will decrease utility costs for building owners
- Based on current customer interest, system is projected to be cash flow positive in year 1 of operation




- Will contribute to current construction industry boom in CBRM.
- System will require multiple, full-time, O&M staff when operational

9

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Funding Analysis – Wastewater Energy Recovery



**INVESTING IN CANADA
INFRASTRUCTURE PROGRAM**

- Investing in Canada Infrastructure Program (ICIP) – Climate Change Mitigation Stream
- Access to 73% capital funding
 - ICIP Contribution: \$27,681,600
 - CBRM Contribution: \$10,238,400

- Application currently being reviewed by provincial government
- To make a decision, Province of Nova Scotia needs:
 - Non-binding letters of interest from building owners
 - Temporary Borrowing Resolution from CBRM

10

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Property Owner Support and Interest

- **56** – Non-binding letters of intent distributed to property owners
- **12** – Attendees at a recent information session held on October 18th.
- **3** – Non-binding letters of intent have already been submitted

District Energy - Downtown Sydney
**Information Session
 for Downtown Sydney
 Building Owners**

October 18, 2021

10:00am - 11:30am

Location: 1000 Sydney Street

Event Registration

<https://downtownsydney.ca/district-energy-2021-2022/>



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11

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Next Steps

1. Continue to gather Letters of Interest from local building owners, whose signature indicates their interest in participating in a DE System that:
 - a) Provides at least 10% energy savings to customers of the system; savings measured from current heating costs
 - b) Reduces greenhouse gas emissions on average throughout the system by at least two thirds
 - c) Delivers the service rapidly. Current goal is to have this system in service before the 2024 heating season
2. Work with provincial government to complete funding application



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12