



REGIONAL DISTRICT of Fraser-Fort George

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REPORT FOR CONSIDERATION

TO: Chair and Directors File No.: BUI CON 1.6
FROM: Gina Layte Liston, Senior Manager of Environmental Services
DATE: February 3, 2025
SUBJECT: 155 George Street HVAC Assessment and Sustainable Replacement Options Analysis Update
SUMMARY: Purpose: For information and approval of recommendation

Attachments: HVAC Assessment & Sustainable Replacement Options - Mechanical Assessment for 155 George Street Report Dated February 3, 2025

Previous Reports:

1. Item No. 12.3, March 2024
2. Item No. 12.2, August 2023

RECOMMENDATION(S):

1. THAT the report dated February 3, 2025 regarding “155 George Street HVAC Assessment and Sustainable Replacement Options Analysis Update”, be received for information.
2. THAT the Board approves Administration to move forward and negotiate a draft term sheet and determine a Class B cost estimate to connect to the City of Prince George’s District Energy System (DES).

ENTITLEMENT	HOW VOTE COUNTED
All 1 Director/1 vote	Majority
All 1 Director/1 vote	Majority

ISSUE(S):

The Regional District’s 155 George Street Office’s heating, ventilation, and air conditioning (HVAC) system was installed when the building was constructed in 1999. In late 2022, the office building suffered failures of some of its heating boilers; due to these failures the building’s heating system was operating at thirty three percent. With direction from the Board in July 2023, one of the four boilers was replaced which brought the system back to 50% capacity. With further examination, the HVAC system condition has shown that integral parts have worn out from age and usage, and there is an increased risk for failure of this equipment unless it is replaced. Board directed Environmental Services Administration to research more sustainable or environmentally friendly heating and cooling options for the building.

At the March 2024 Regional Board Meeting, the Board approved a competitive bid process for the provision of the 155 George Street HVAC assessment sustainable replacement options analysis. McCuaig and Associates Engineering was retained to undertake an analysis of the heating, ventilation, and air conditioning systems of the office building. The primary goal was to provide the Regional District with a clear understanding of the current condition and performance of the existing HVAC system, including:

- major equipment and operating conditions;
- electrical load assessment;
- utility analysis;
- energy modelling; and,
- a determination of any system issues;

A second goal was to review the potential HVAC replacement options with a focus on energy savings and sustainability and provide a cost comparison with net present value. The replacement options included: geothermal, electrification, district energy, solar, and an existing system optimization.

The final report also provides recommendations for moving forward and available incentives and grants for such projects.

The Board is being asked to consider authorizing Administration to move forward and negotiate a draft term sheet and determine a Class B cost estimate to connect to the City of Prince George’s Downtown District Energy System (DDES).

RELEVANT POLICIES:

1. Policy RD-03-09: Procurement of Goods and Services
 - provides for procurement levels and limits.

STRATEGIC PRIORITIES ALIGNMENT:

- | | | | |
|--|---|--|--|
| <input type="checkbox"/> Indigenous and Intergovernmental Partnerships | <input type="checkbox"/> Organizational Strength and Adaptability | <input checked="" type="checkbox"/> Quality Community Services | <input checked="" type="checkbox"/> Environmental Stewardship and Climate Action |
| <input type="checkbox"/> Awareness and Engagement | <input checked="" type="checkbox"/> Statutory or Routine Business | | |

SERVICE RELEVANCE:

The 155 George Street Office building is the main office building in which staff work, and where a number of the Regional District of Fraser-Fort George services are provided to the public. The building’s heating system is key to delivering the year-round services of Regional District business.

FINANCIAL CONSIDERATION(S):

Budget implications for the 155 George Street HVAC Assessment and Sustainable Replacement Options Analysis are reflected in the proposed 155 George Street Office Building Budget (1412).

OTHER CONSIDERATION(S):

N/A

DECISION OPTIONS:

1. Approve recommendations.
 - Administration to move forward and negotiate a draft term sheet and determine a Class B cost estimate to connect to the City of Prince George’s Downtown District Energy System (DES)

Other Options:

- a. Do not approve recommendations and request further information.
 - advise Administration to return with Class B cost estimates for one or more of the options for the Board’s consideration, or
 - replace the existing boilers.

COMMENTS:

The primary objective of this analysis was to assess the condition, performance, and remaining service life of the heating, ventilation, and air conditioning (HVAC) components - boilers, chillers, fan coils, air handling units, and associated infrastructure- and to identify opportunities for improvements in energy efficiency and sustainability. Those opportunities included the following options for analysis: geothermal, electrification, district energy (DES), solar (photovoltaic panels), and an existing system optimization. The report outlines a description; the methods of implementation; the advantages and disadvantages; and the probable costs for each of these.

The evaluation found that the building's hydronic heating system currently operates:

- at high supply temperatures with new fan coils;
- is coupled with domestic hot water production, which restricts the boilers from condensing and running at peak efficiency;
- the three newer condensing boilers and recently installed fan coils remain in good condition;
- the oversized air handling unit is outdated and significantly oversized for the building's ventilation requirements, leading to increased energy consumption; and,
- the cooling equipment is generally in acceptable condition.

In terms of energy performance, it was identified that the 155 George Street building performs worse than provincial and national benchmarks, suggesting a clear need for the HVAC strategy to be reconsidered.

The analysis identified that the two most feasible options for upgrading the heating system would be electrification and connection to the district energy system (DES). Both options would require modifications to the mechanical system; but would allow the existing fan coils to remain in use. Of those two options, McCuaig and Associates Engineering recommends pursuing the district energy system connection as the preferred solution given the RDFFG's intent to reduce carbon emissions, the financial feasibility, and the local weather. The DES has been identified as a unique opportunity to connect to a reliable, easy-to-maintain, centralized, low carbon- intensive heating generation system. The system can be used for both heating and domestic hot water systems. Heat exchangers used in DES connections typically have a service life of up to 50 years, compared to approximately 25 years for boilers, resulting in fewer capital projects and maintenance costs over the system's life span.

The net present value of the different options which compares the value of future cash flows to the initial cost of investment is as follows:

- District Energy System- \$82,221.35
- Existing System Optimization- \$75,749.99
- Electrification- \$69,614.86
- Geothermal- -\$172,035.99
- Solar- -\$70,818.19 (solar is separated out as this would be an add-on to the existing system for electricity generation and would not be a replacement for the heating and domestic hot water systems).

It is Environmental Services Administration's recommendation to work with the City of Prince George on drafting a term sheet and a cost estimate for connection to the DES and return this information to the Board in Fall of 2025.

The DES option aligns with the RDFFG's Corporate Climate Change Action Plan where the district energy system was identified as a "action item" for renewable energy and would also meet the RDFFG Board of Director's strategic priorities under Environment and Sustainability.

Environmental Services Administration will be joined by McCuaig & Associates Engineering Ltd. for a presentation at the February Board meeting.

Respectfully submitted,

"Gina Layte Liston"

Gina Layte Liston
Senior Manager of Environmental Services

GLL:jt