

TO: CHAIR AND MEMBERS
ENVIRONMENT COMMITTEE

DATE: 2021 January 12

FROM: DIRECTOR ENGINEERING

FILE: 4220-04

**SUBJECT: UPDATE ON FEASIBILITY STUDY FOR CITY HALL CAMPUS
PHOTOVOLTAIC SOLAR SYSTEM INSTALLATION**

PURPOSE: To provide the Environment Committee with results of the City Hall Campus photovoltaic solar system installation feasibility study.

RECOMMENDATION:

1. **THAT** the Committee and Council authorize staff to proceed with detailed design of the recommended pilot PV solar system as described in this report.

REPORT

1.0 INTRODUCTION

The Environment Committee requested that staff investigate the feasibility of a PV solar installation at the City Hall Campus. This report will present the results of that feasibility study and recommend a system configuration for Committee and Council's consideration.

2.0 POLICY SECTION

The photovoltaic solar system installation is aligned with the City of Burnaby's Corporate Strategic Plan by supporting the following goals and sub-goals of the Plan.

Goal

- A Healthy Community
 - o Healthy life –
Encourages opportunities for healthy living and well-being
 - o Healthy environment –
Enhance our environmental health, resilience and sustainability
 - o Lifelong learning –
Improve upon and develop programs and services that enable ongoing learning

- A Dynamic Community
 - o Economic opportunity –
Foster an environment that attracts new and supports existing jobs, businesses and industries
 - o Community development –
Manage change by balancing economic development with environmental protection and maintaining a sense of belonging
 - o City facilities and infrastructure –
Build and maintain infrastructure that meets the needs of our growing community
- A Thriving Organization
 - o Technology and innovation –
Support technology development and innovation to empower staff and to advance community objectives

3.0 BACKGROUND

At the request of the Environment Committee, staff undertook a feasibility study for a PV solar installation in various areas of the City Hall Campus. Financial, environmental, and practical factors were all considered in determining the feasibility of the various options. Many different configurations were studied, but three main options were investigated in detail:

1. Rooftop installation on the City Hall Main Building
2. Rooftop installation on the City Hall West Building
3. Ground mounted installation over the parking lots and/or courtyards

All the options investigated were similar in that they all avoided approximately 9.7 tCO₂e per GWh of electricity produced. Using current spot market power rates, the financial payback for all of the systems is estimated to be between 10 - 15 years (not including any structural upgrades to buildings for rooftop installations).

Further investigation determined the roofs of the City Hall Main Building and West Building do not have the load bearing capacity to support PV solar panels. Installing PV solar panels on rooftops typically triggers additional snow and wind load requirements. The buildings would need extensive structural upgrades to support the additional loads. This would be true of any building, regardless of its age, that was not originally designed for rooftop PV solar.

The ground mounted PV solar systems were assessed in the parking and courtyard areas of the City Hall Campus. A photo of the ground mounted parking shade structure at the BCIT Burnaby campus is shown below to illustrate what a ground mounted parking canopy structure might look like.

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BCIT Burnaby Campus PV Solar Installation

Ground mounted systems are typically more straightforward to install than rooftop systems because they do not require a roof with enough load-bearing capacity. Ground mounted systems can also offer additional benefits such as shading and cover that make spaces more comfortable for use. The key features of a good ground mounted PV solar installation are good sun exposure and proximity to an electrical load or BC Hydro interconnection.

The West Building fleet parking lot and staff parking lot on the northeast corner of Canada Way and Norland Avenue both have ideal conditions for a ground mounted solar parking canopy. There are no tall structures or trees directly south of these lots to limit sun exposure and there is a BC Hydro interconnection point close by. A ground mounted solar parking canopy would also provide shading to improve the comfort and usability of the spaces. The EV charging stations in that lot could also be directly or notionally supplied by the PV solar panels.

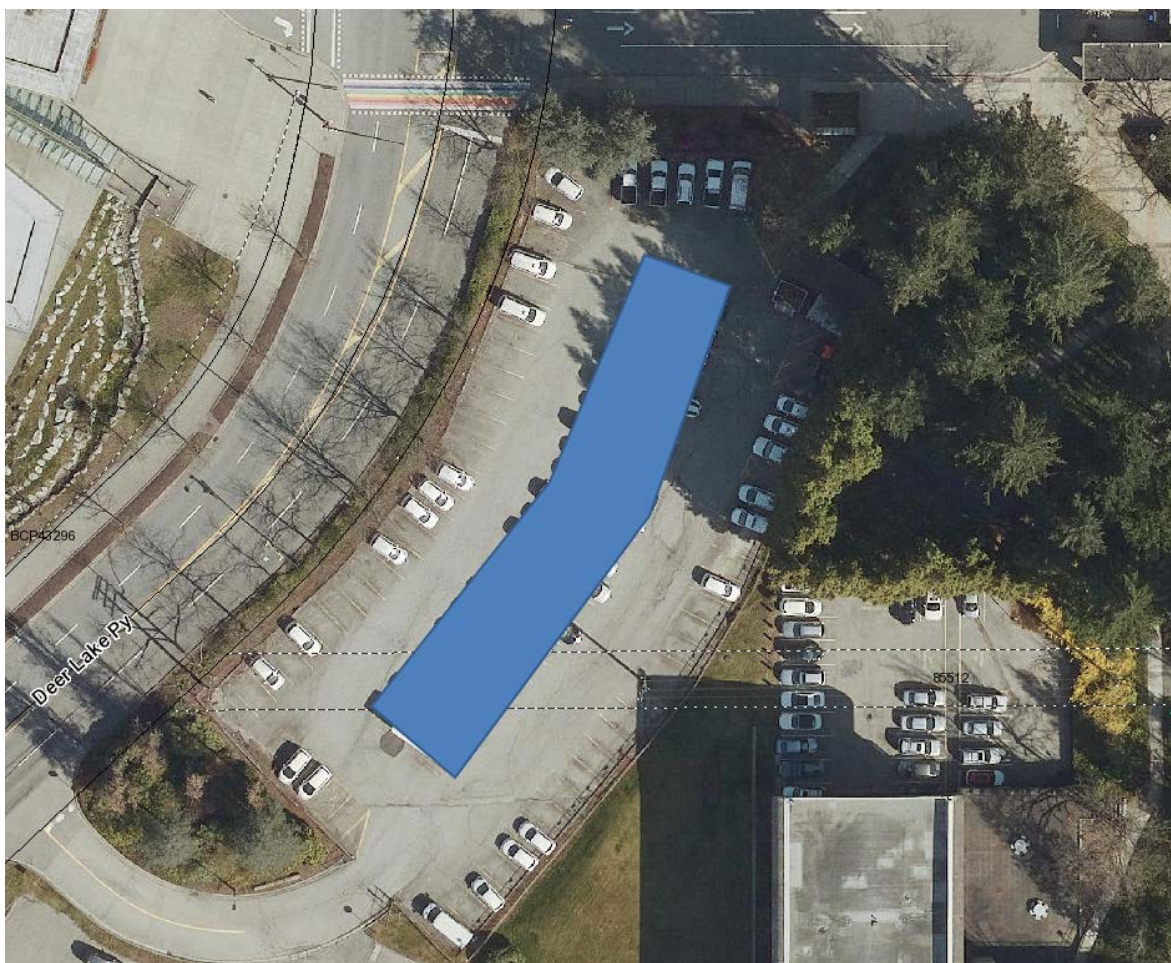
The feasibility study estimated there is space for over 2,000 PV solar modules in the two parking lots (see pictures below). Staff recommend proceeding with detailed design of a much smaller system (approximately 100 panels) to start in order to gain more experience with PV solar technologies, learn about the various BC Hydro net-metering programs and assess the actual performance of PV solar before making the decision to invest in a large system. A system with 100 panels would produce approximately 43 MWh of power each year and cost approximately \$150,000. The location, specifications and cost estimates will be verified during detailed design.

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Ground Mounted PV Solar Parking Canopy Canada Way/Norland

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Ground Mounted PV Solar Parking Canopy West Building Fleet Parking

4.0 RECOMMENDATION

It is recommended that the Committee recommend Council to authorize staff to proceed with the detailed design of a pilot PV Solar System as outlined in this report.

Leon A. Gous, P.Eng., MBA
DIRECTOR ENGINEERING

JL/ac

Copied to: City Manager
Director Corporate Services
Director Planning & Building
Director Finance
Director Parks, Recreation and Cultural Services