

City of Edmonton Youth Council - Solar Energy - Further Information

Recommendation:

That the September 28, 2016, City of Edmonton Youth Council report CR_3647, be received for information.

Report Summary

This report provides a summary of the City of Edmonton Youth Council's investigations on the implementation of a solar panel array and city-wide solar generation dashboard at Edmonton City Hall.

Previous Council/Committee Action

At the August 8, 2016, Agenda Review Committee meeting, this report was rerouted to the August 17, 2016, Urban Planning Committee meeting.

At the April 25, Community Services Committee meeting, the following motion was passed:

That City of Edmonton Youth Council and Administration collaborate to investigate the implementation of a solar panel array and citywide solar generation dashboard at Edmonton City Hall and provide a report to Committee.

Report

- The City of Edmonton Youth Council is an Advisory Committee of City Council. Its mandate is to inform City Council on issues affecting youth.
- Through deliberations, the City of Edmonton Youth Council determined there is a need to showcase solar energy projects in Edmonton.
- Leadership in solar energy would be a continuation of the City's commitment to investing in energy diversification and collaboration across the city and the energy sector.
- The importance of energy diversification in Edmonton through options like solar energy would assist in moving the City ahead with the strategic directions outlined in *The Way We Green* and the Energy Transition Strategy. This is a cornerstone of energy diversification, as well as a means to be less dependent on nonrenewable energy sources such as fossil fuels.

Structural Feasibility Assessment

- A thorough Engineering and Lifecycle Planning Feasibility Assessment was conducted, and it was found that it would be safe to install a rooftop solar panel array on the roof of Edmonton City Hall.

- City Hall roof is scheduled for replacement in 2017. The existing system will be replaced with a lighter, un-ballasted, membrane-type roofing system. Anticipated date of completion is Third Quarter 2017.

Financial Assessment

Important constraints created by the unique architecture of the City Hall roof and the additional equipment required to comply with EPCOR regulations for microgeneration installation in the downtown core have a significant impact on the estimated cost of the proposed installation. Compared to a similar installation on a suburban non-constraint roof (ex. municipal garage), the return on investment is significantly longer.

Preliminary Cost Estimate

- Total: \$486,000 within -10 percent and +50 percent
- The cost estimate included above does not include the cost of the Citizens Energy Dashboard, but only for the Solar photovoltaic array. As well, it does not take into account potential provincial and municipal grants that are set aside for projects of this nature.
- Potential financial support in the fourth quarter of 2016 may be available from the Government of Alberta in the form of Climate Change and Emissions Management Corporation funds and this should be investigated thoroughly.
- The Alberta Municipal Solar Program currently offers small funding for solar panel installation for a system of this size.
- Citizens Energy Dashboard could be eligible for additional funding through community and art partners, if some form of public solar-powered art is included in the final design.

Citizens Energy Dashboard

- *The Way We Green*, Edmonton's Environmental Strategic Plan, outlines the importance of community exposure to energy efficiency and environmental initiatives. While Edmontonians might realize the importance of those topics on a global and abstract scale, they are rarely able to relate them to their everyday lives in concrete ways.
- An Edmonton citizen interacting with the dashboard should be able to take note of the various City of Edmonton solar installations and learn about energy efficiency measures through the following pages:
 - a main "landing page",
 - a page showing a list of up-to-date solar photovoltaic installations at City of Edmonton facilities (currently Queen Elizabeth Pool, Meadows Fire Station and more in the future) and their energy output in terms of "lightbulbs", GHG emissions mitigated in terms of "cars displaced", and money saved in another easily relatable but accurate term, and
 - a page showing common and easy energy efficiency measures that citizens can implement in their own homes and workplaces.
- The Citizens Energy Dashboard will be displayed both on site and online through the City of Edmonton website.

- Administration currently has data from its other solar installments, and plans to showcase this information on the Citizens Energy Dashboard.
- The Citizens Energy Dashboard would be an opportunity to connect Edmontonians to a local initiative and to advance public engagement on this topic. After some deliberation, City of Edmonton Youth Council has decided to propose a solar-powered public art installation as part of the dashboard.
- This artistic element of the dashboard can hopefully allow citizens to interact with electrical use in a tangible way and learn about energy efficiency in the context of their own habits, homes, and communities. Solar Photovoltaic systems are already being piloted at various locations in Edmonton, including Queen Elizabeth Pool and the Meadows Fire Station.
- Some example drawings of the dashboard are included in Attachment 1.
- The City of Edmonton Youth Council would like to continue collaborating with Administration to further develop this concept of the Citizens Energy Dashboard, and in particular engage youth and citizens in creating the content and preliminary assessment.

Findings About City Hall Energy Consumption

- While investigating, it was found that City Hall consumes a total of 2,652,286 kWh units of electrical energy annually, which is roughly the equivalent to 368 Alberta households.
- This number was verified with the Office of Energy Management, and the City of Edmonton Youth Council believes that the total energy consumption at City Hall can be reduced.
- City of Edmonton Youth Council determined that it may be more practical to look at energy efficiency measures to reduce energy usage at City Hall.
- It would be beneficial to further assess energy efficiency audits of City Hall to reduce consumption and save on electricity costs. These further assessments could include but are not limited to:
 - assessing heating usage in the parkade and pool
 - evaluating insulation layers of City Hall glass pyramids
 - using infrared thermometer to check for window heat leakage
 - energy metering technologies
 - motion sensor light switches
- City of Edmonton Youth Council believes that it would be meaningful to involve youth in collaboration with Administration in conducting these audits.

Conclusion

- It was concluded from the assessment that a rooftop solar array installation is not viable at City Hall, and so it will not be pursued as a site at this time.
- City Operations Greenhouse Gas Management Plan aims to achieve a 50 percent reduction in Greenhouse Gas Emissions from City operations by 2020. Based on the assessments conducted, City Hall is not the most ideal site to meet this defined target. Instead, other high profile city-owned sites should be assessed in order to determine sites that are both highly engaging and can help the City meet this efficiency target.

- Administration and City of Edmonton Youth Council do not support the City Hall site from a financial cost savings standpoint or to support the advancement of the City Operations Greenhouse Gas Emission target.
- Based on the current financial outlook and with an unclear funding model, the City of Edmonton Youth Council does not recommend installing a solar panel array at City Hall.
- City of Edmonton Youth Council will continue collaborating with Administration to determine a site selection decision making matrix, including financial assessments for selecting future sites within the city.
- City of Edmonton Youth Council will continue to collaborate with Administration and bring forward a full assessment including site selection, design, financial and citizen engagement related to the Citizens Energy Dashboard.
- City of Edmonton Youth Council will collaborate with Administration to determine the need for conducting an energy audit of City Hall and determining possible energy efficiency measures.

Policy

- *The Way We Green*, Edmonton's Environmental Strategic Plan, outlines the importance of community exposure to energy efficiency and environmental initiatives. Citizens Energy Dashboard would be an opportunity to connect Edmontonians to a local initiative and advance the vision outlined in *The Way We Green*.
- Edmonton's Community Energy Transition Strategy states that "The City is better positioned than any other entity in Edmonton to coordinate and lead Edmonton's energy transition." The City must lead by example with exemplary energy efficiency and GHG mitigation performance in its own operations.

Corporate Outcomes

This report is aligned with the following Corporate Outcomes:

- The City of Edmonton's operations are environmentally sustainable and implementing energy efficiency measures ensures the city's operations are sustainable.
- Edmonton is an environmentally sustainable and resilient city and ensuring accountability for the environment displays leadership towards reaching the Greenhouse Gas Emission target.
- Edmontonians are made aware of the importance of energy efficiency in their everyday lives, as a citizen energy dashboard would provide opportunities for citizens to participate and interact with energy consumption and education in their everyday lives.

Attachment

1. Concept Design for Citizens Energy Dashboard

Others Reviewing this Report

- A. Laughlin, Deputy City Manager, Integrated Infrastructure Services
- R. G. Klassen, Deputy City Manager, Sustainable Development