SUBJECT: Renewable Passive Energy Generation for The Port Colborne Operations Centre

1) PURPOSE

This report, requested by Council at the November 28, 2016 Council meeting, was prepared by Darlene Suddard, Environmental Compliance Supervisor, and authorized by Ron Hanson, Director of Engineering & Operations. This report was prepared to advise Council on potential renewable passive energy generation options for the new Port Colborne Operations Centre (PCOC).

2) HISTORY, BACKGROUND, COUNCIL POLICY, PRACTICES

As outlined in the Green Energy Act (GEA), 2009 all Ontario municipalities are required to ensure compliance with O. Reg 397/11 – Energy Conservation and Demand Management Plans. As directed in this regulation, the City of Port Colborne is required to collect and report on annual energy consumption rates and is required to prepare an Energy Conservation and Demand Management Plan (ECDM), and update the Plan every 5 years.

On June 9, 2014, Council approved the City's Energy Conservation and Demand Management Plan. One of the goals of the City's Plan is to seek opportunities to utilize renewable energy sources where feasible and practical.

In May 2016, Council approved the construction of the PCOC. This 3,324 square metre (35,780 square foot) facility will replace the current Public Works Yard, located at 11 King Street, and the current Parks Office, located at 54 West Side Road and will combine the Roads, Water, Parks and Engineering Departments under one roof. Unlike the Vale Health & Wellness Centre, official LEED certification is not being sought for this facility; however, the design is comparable to a LEED Certified building with a key emphasis on a sustainable design, which maximizes natural daylight with strategic window placement, specifies energy efficient materials and equipment such as requiring the building insulation and HVAC system to be more efficient than required by the Building Code, and by sourcing local building products wherever practical. In the spirit of the goals of the ECDM Plan, Council requested that staff investigate the feasibility of incorporating a renewable passive energy generation installation into the PCOC.

3) STAFF COMMENTS AND DISCUSSIONS

City staff consulted with the Energy Efficiency Advisor from Canadian Niagara Power to determine what opportunities and/or programs were currently available for a renewable passive energy generation installation for the PCOC.
There are currently three options for renewable passive energy generation for the PCOC:

a. **Option 1 - Reduce Electricity Costs**
   To reduce the electricity costs associated with the operation of the PCOC, the City could install a renewable passive energy generation system (most likely roof-mounted or ground mounted solar photovoltaic panels) at the PCOC. This system would be designed to provide electricity for the operation of the centre, thus reducing the amount of electricity purchased from the grid, and the associated electricity costs.

   This would require that a company with expertise in designing and installing renewable passive energy generation systems be hired to evaluate the facility. The evaluation would recommend which technology to install and the estimated cost-savings over the life expectancy of the installation in order to perform a cost-benefit analysis of such an installation.

   According to the City’s Building Department, the PCOC was designed with the structural capacity to incorporate roof-mounted solar panels. Such an installation would require a building permit to be issued and would be supported by the appropriate engineered designs. Should ground mounted solar arrays be the preferred technology, these arrays are not governed by the Ontario Building Code, thus would not require a building permit.

b. **Option 2 - Feed-in-Tariff (FIT)/microFIT Programs**
   These programs are designed for projects that generate electricity from a renewable resource such as wind, water, solar energy and bioenergy. The microFIT program is for projects with a capacity of 10 kilowatts or less. The FIT program is for larger projects. If an application to participate was approved by the Ontario Power Authority (OPA), the City would be required to sign a contract with the OPA for 20 years to sell electricity to the grid and the City would receive a guaranteed price per kilowatt hour.

   Under this program, any energy generated from the PCOC would be fed into the grid – and would not directly offset the energy consumed by the PCOC. In the current political climate, there is no guarantee that the current programs will continue or that contracts would continue to be honoured. Additionally, in December, 2016, Ontario’s Minister of Energy issued a directive to the Independent Electricity System Operator (IESO), reducing the procurement targets for the FIT/microFIT programs. This reduction will make it much more difficult to receive approval for a FIT/microFIT project. The Minister’s Directive also reiterated a commitment to transitioning the microFIT program to net metering – which is discussed in more detail under Option 3 – indicating that this program may be coming to an end.

c. **Option 3 - Net Metering**
   The Province enacted O.Reg. 541/05: Net Metering in 2005. This regulation provides any Ontario customer who generates electricity primarily for their own use and from a renewable source (bioenergy, wind, solar photovoltaic and waterpower) using equipment with a capacity of 500 kilowatts or less, with the opportunity to take advantage of the net metering incentive.
According to the Ministry of Energy’s website, net metering is a billing arrangement whereby customers can send electricity generated from renewable sources to the electrical grid for a credit towards their electricity bill. The customer’s local distribution company will subtract the value of electricity supplied to the grid from the value of what is taken from the grid over a billing period. If a customer supplies more power to the grid than they take from it over the billing period, they will receive a credit that they can carry over to help lower future electricity bills. The credit can be carried forward for up to 12 months.

The evaluation required for Option 1, with an additional section detailing the forecasted monthly credits (if any) would be required in order to determine the cost-benefit of installing a passive energy generation system and taking advantage of the Province’s net metering program.

It is the opinion of staff that the option that best fits the goals of the City’s Energy Conservation and Demand Management Plan is Option 3, therefore it is recommended that Option 3 be investigated to determine:

a) The feasibility of installing a renewable passive energy generation system at the PCOC (including an investigation into if there is capacity in the system),
b) The recommended passive energy generation system (size and type),
c) The feasibility of net metering,
d) The cost of installing the system,
e) The estimated energy consumption savings and estimated financial savings, and;
f) The cost-benefit analysis of the total energy saved vs. the installation costs.

In speaking with a business owner in Niagara who is currently installing solar photovoltaic panels and participating in the net metering program, they did not undertake a feasibility study as they were fully committed to installing a passive energy generation system. The owner recommended that prior to conducting a feasibility study that the facility be operated for a full year in order to be able to understand the fluctuating energy demand for the facility. The reason for this is that the system should not be sized to meet the maximum demand required by the facility, as the facility doesn’t operate at peak demand 24/7. If the system were sized to generate all the electricity the facility needed (i.e. go “off grid”) then the City wouldn’t be able to utilize the net metering program to its full effect, as the energy provider would pay a miniscule amount for the energy generated, versus receiving a credit in kWh that would offset future consumption.

This business owner has estimated a 7-year payback on the passive energy generation system, with the system having an approximate 20-year lifespan.

4) OPTIONS AND FINANCIAL CONSIDERATIONS

a) Do nothing.

Council may choose not to pursue a renewable passive energy generation system at the PCOC.
b) Other options

Council may choose to direct staff to investigate the Feed-in-Tariff programs in order to sell energy to the grid. However, as discussed under Option 2, staff do not recommend this option due to the uncertain political climate currently surrounding renewable energy contracts.

5) COMPLIANCE WITH STRATEGIC PLAN INITIATIVES

Not Applicable.

6) ATTACHMENTS

None.

7) RECOMMENDATION

That staff be directed to request during the budget for 2018 to procure the services of a consultant to investigate the feasibility of installing a renewable passive energy generation system at the Port Colborne Operations Centre as well as participation in the Province’s Net Metering program, for the purposes of offsetting the facility’s electricity consumption and costs.

8) SIGNATURES

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