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**REPORT TO FINANCE COMMITTEE
MEETING OF WEDNESDAY, OCTOBER 5, 2016**

SUBJECT **CRD Fuel Cell Electric Vehicle Project**

ISSUE

To provide information on the Fuel Cell Electric Vehicle Project, which aims to test/pilot the use of hydrogen fuel cell electric vehicles (FCEVs) within the CRD fleet and support the development of publicly available hydrogen fuel cell fueling infrastructure within the Capital Region.

BACKGROUND

FCEVs are zero-emission vehicles that reduce GHG emissions inventory and tailpipe emissions by 100% compared to their conventional counterparts. These vehicles produce power through an electrochemical process combining hydrogen and oxygen atoms in a fuel cell stack. The resulting electricity is then applied to a small electric motor that powers the vehicle. Embodied emissions are included in the production and transport of hydrogen to the fueling site.

The FCEV project is a component of a broader Zero Emissions Fleet Initiative which the CRD is developing as part of its commitment to reduce corporate greenhouse gas emissions by 33% by 2020.

The FCEV project has two goals:

- Test/pilot hydrogen FCEVs as replacements for existing gas/diesel powered vehicles within the CRD vehicle fleet.
- Support the development of publicly available hydrogen fueling infrastructure within the Capital Region.

The project will be jointly-funded through industry, grants, university, and government contributions in the following way:

- The test/pilot of FCEVs in the CRD fleet will be funded by the Green Municipal Fund (GMF) Pilot Project Grant (if successful in application), the CRD (through the equipment replacement fund) and the Ministry of Energy and Mines Clean Energy Vehicle (CEV) Program. Staff are working with Hyundai to finalize the price of piloting the pre-production vehicles and are preparing an application to the GMF. The net cost to the CRD (after applying the grant funds) is expected to be equivalent to similar class vehicles already within the fleet.
- The development of publicly available hydrogen fueling infrastructure will be funded by industry with support from provincial or federal government grants, incentives, and programs as outlined below.

The pilot project aims to launch in 2017 and run for 3 years, with a view towards eventual adoption of FCEV technology within the CRD fleet as a regular use vehicle. Hyundai Canada has

committed 2 pre-production 'Tucson' FCEVs for pilot testing in the 2017 year. More 'next generation' production Hyundai Tucson FCEVs will be made available in 2018. Currently the Hyundai Tucson FCEV is a pre-production vehicle and there are less than 10 in Canada. As this project is innovative in nature and will represent the first local government fleet application of the Tucson FCEV in Canada, the project represents a key opportunity to study and learn from the application of FCEVs within a local government fleet. The Institute for Integrated Energy Systems at the University of Victoria (IESVic) has partnered with the CRD on this project and the Zero Emissions Fleet Project to study the application of FCEVs within the CRD fleet. The project is still in development, and staff are working to conduct a feasibility analysis, develop a project budget plan, and establish further partnerships.

Fueling Infrastructure:

Key to the success of this project is establishing hydrogen fueling infrastructure within the Capital Region. By ensuring that the fueling infrastructure is accessible to the CRD fleet, residents, businesses and fleets across the Capital Region, this project promotes the adoption of zero emissions vehicles and GHG emissions reductions both within the CRD's corporate fleet and more broadly across the community.

The fueling infrastructure is estimated to cost between 2 to 2.5 million dollars, which will be jointly funded by some combination of provincial and/or federal grants and industry participation. The project envisions a fueling station that is industry owned/operated, publicly available and available to CRD operations staff to meet operational needs. The CRD has a role to play to incentivize investment in hydrogen fueling in the Capital Region, both as a facility user and as a Regional Leader.

Two funding avenues have been identified to incentivize fueling infrastructure:

1. Through the British Columbia Ministry of Energy and Mines "Part 3 Agreements Program" the Ministry of Energy and Mines (MEM) has issued a call out to conventional, GHG intensive fuel suppliers who are in a carbon deficit to develop or partner on projects that will significantly reduce GHG emissions, thereby creating carbon credits. A letter from CRD to the MEM in support of any proposed in-region hydrogen fueling projects would strengthen applications for the Capital Region, and could incentivize a provincial/industry funded station to be developed within the CRD in the near-term.
2. Natural Resource Canada has issued a call for proposals through the Natural Resources Canada Energy Innovation Fund. The CRD's support of industry-led applications to this fund, through a letter of support for any and all interested industry parties, could strengthen industry applications. The letter of support would be one of general support and not commit the CRD to a partnering relationship with any specific industry party.

Letters of support from the CRD would include the following elements:

- Identify the CRD's interest in supporting hydrogen fueling infrastructure in the Region;
- Indicate that the CRD would like to partner with the successful proponent selected through the various funding agencies during the pilot testing phase;
- Indicate that Hyundai has committed to the CRD pre-production pilot vehicles in 2017 and production vehicles in 2018;

- Indicate that the CRD is applying to the Green Municipal Fund to pilot vehicles, and working in partnership with the Institute for Integrated Energy Systems at the University of Victoria on the pilot project;
- Stipulate criteria that would be important to the CRD in the establishment of an in-region station, including siting/location that meets operational needs, reducing lifecycle GHG emissions associated with hydrogen production, and ensuring system technical requirements match operational needs;
- Offer the CRD's role as a Regional Leader to help coordinate relationships with municipalities and other regional fleets (e.g. provincial government, BC transit etc.) who might be interested in accessing the infrastructure or piloting FCEVs.

ALTERNATIVES

That the Finance Committee recommends:

1. That staff be directed to further develop the Fuel Cell Electric Vehicle Project, and the CAO be authorized to provide letters of support to the Ministry of Energy and Mines and any and all industry players that request support in respect of applications to senior government agencies for the development of hydrogen fueling infrastructure within the Capital Region.
2. That the report be referred back to staff for further information.

IMPLICATIONS

ENVIRONMENTAL IMPLICATIONS

FCEVs are zero-emission vehicles that will reduce the CRD's corporate GHG emissions inventory and tailpipe emissions by 100% compared to their conventional counterparts. In broad terms, this equates to an approximate GHG emissions savings of between 2,100 and 4,400 kg of CO₂-e per year for each vehicle that is replaced with a FCEV.

Embodied GHG emissions are associated with energy used to produce hydrogen and transport it to the fueling site. Vancouver Island has good options for producing hydrogen with very low embodied GHG emissions, as electricity is relatively low in GHGs in British Columbia, and as there is potentially a source of waste industrial hydrogen on the Island. Minimizing embodied GHG associated with hydrogen production is a key objective of this project.

ECONOMIC IMPLICATIONS

The net cost to the CRD to pilot FCEVs is expected to be equivalent to the cost of owning and operating equivalent conventional vehicles (after applying grant funds).

INTERGOVERNMENTAL IMPLICATIONS

This project provides an opportunity for the CRD to play a role as Regional Leader to support other municipalities or regional fleets (e.g. provincial government, BC transit, etc.) to join in the piloting of FCEVs.

A project team, with representatives from the CRD, BC Ministry of Energy and Mines, and the Institute for Integrated Energy Systems at UVic, is working together to develop a project proposal and work plan. The BC Ministry of Energy and Mines has provided a 15,000 dollar contribution to the CRD to support conducting further feasibility analysis regarding piloting the use of FCEVs

within the CRD fleet, and incentivizing hydrogen fueling infrastructure within the Capital Region. Regular updates will be provided to the committee on the progress of the project proposal and the final proposal for the project will come to the committee and board for approval, prior to any implementation.

CONCLUSION

The proposed FCEV project represents the first local government fleet application of the Hyundai Tucson FCEV in Canada. The project will reduce the CRD’s corporate GHG emissions inventory and tailpipe emissions by 100% compared to conventional vehicle counterparts, and provides a cost-effective and innovative way for the CRD to work towards meeting the Board’s directive to accelerate corporate mitigation activities.

RECOMMENDATIONS

That staff be directed to further develop the Fuel Cell Electric Vehicle Project, and the CAO be authorized to provide letters of support to the Ministry of Energy and Mines and any and all industry players that request support in respect of applications to senior government agencies for the development of hydrogen fueling infrastructure within the Capital Region.

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