



To: Public Works and Transportation Committee

Date: April 24, 2012

From: Tom Stewart, AScT.
Director, Public Works Operations

File: 10-6000-01/2012-Vol
01

Re: **Electric Vehicle - Community Charging Infrastructure Grant Funding Opportunity**

Staff Recommendation

That an application for a community electric vehicle charging plan and infrastructure grant be submitted to the Fraser Basin Council upon announcement of the availability of provincial funding for this work.

Tom Stewart, AScT.
Director, Public Works Operations
(604-233-3301)

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ROUTED TO:	CONCURRENCE		CONCURRENCE OF GENERAL MANAGER
Sustainability	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	
Transportation	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	
Parks and Recreation	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	
Facilities Services	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	
REVIEWED BY TAG	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	REVIEWED BY CAO
			YES <input checked="" type="checkbox"/>
			NO <input type="checkbox"/>

Staff Report

Origin

The BC Government has established a \$17 million funding program to promote clean-energy vehicles, infrastructure, home charging stations and the BC SCRAP-IT Society. A component of this funding program is a point-of-sale incentive program, which provides up to a \$5,000 rebate on qualifying new battery electric vehicles. To date, the City has received \$15,000 in rebates through this program related to the purchase of three electric vehicles (Chevrolet Volts). The program also provides for rebates of up to \$500 to homeowners who install dedicated charging stations in their homes.

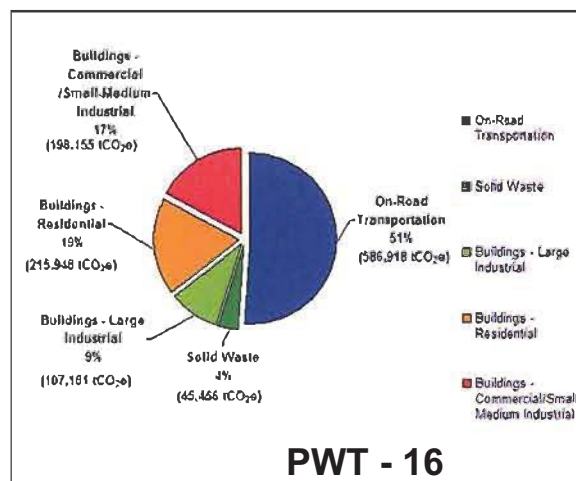
As part of the overall program, the Province recently announced a \$6.28 million funding initiative, expected in the next month, to support planning and installation of community-wide electric vehicle charging stations. The objective is to achieve 570 level two publicly-accessible charging stations throughout the province, approximately one-half of which are anticipated to be in the Metro Vancouver and Southern Vancouver Island regions -- with an allocation of approximately \$2.74 million. This portion of the funding will be managed by the Fraser Basin Council and staff have been advised that the timeline for submissions will be limited. In preparation for the funding call, this report presents a project to undertake planning for community-wide charging infrastructure, as well as installation of some initial community charging infrastructure points in Richmond. Further, the report seeks approval to apply to the infrastructure-charging fund when the funding call is announced.

Analysis

Background

Funding incentives are expected to result in 10,000 - 20,000 electric vehicles in Metro Vancouver by 2020. This would reduce greenhouse gas emissions (ghg) by an estimated 35,000 tonnes by 2020, increasing to 111,000 tonnes by 2030 (.66% - 2%) as adoption of electric vehicles increases. Growth in the electric vehicle market to 130,000 vehicles by 2030 would reduce ghg emissions by 6.5%. Personal transportation accounts for 14% of ghg emissions in the province, where in the average BC household, almost half (45.3%) of emissions come from personal cars and trucks. In Richmond, transportation accounts for approximately 50% of the community's ghg emissions (according to 2007 data):

Community GHG Emissions 2007



Currently, the price of an electric vehicle is approximately double that of a standard gasoline engine vehicle. When electricity and fuel costs are considered, an electric vehicle is approximately \$7,400 more expensive than a gasoline vehicle over a standard eight year service life. Therefore, the provincial incentive program is key to encouraging growth in electric vehicle uptake. As electric vehicle battery technology improves and the price of the battery reduces, electric vehicles will compete much more favourably.

A principal disincentive to electric vehicles is driver concern about running out of charge due to a lack of accessible charging infrastructure within their traveling range or while ‘on the go’. This is commonly referred to as “range anxiety”. It is expected that 80% of charging will occur at home, 18% at work and 2% while ‘on the go’. Despite most charging being expected to happen at home, it will be crucial to provide access to charging infrastructure in a variety of locations to foster growth in the electric vehicle market. This is because ready access to charging points will ease driver “range anxiety” issues and encourage electric vehicles to be used for all vehicle trips. Locations such as office, retail parking lots, public spaces, park ‘n rides, and commercial businesses are among the charging locations targeted by the upcoming provincial infrastructure funding program.

There are three levels of charging infrastructure. The cost and charge times are shown below. Level 2 charging infrastructure is being targeted in the upcoming funding initiative for local governments and businesses/institutions. In tandem, the province is developing a plan and implementation strategy for thirty Level 3 fast charge stations throughout the province.

	<u>Cost Range</u>	<u>Time to Full Charge</u>
• Level 1:	\$1,000 or less	12 - 20 hours
• Level 2:	\$2,000 - \$10,000	4 - 6 hours
• Level 3:	\$60,000 - \$100,000	under 30 minutes

In order to maximize the funding opportunity to the City associated with planning and installation of charging infrastructure, it is suggested that the City’s grant application address both local planning and infrastructure installation, as discussed below. Staff’s understanding is that funding of up to \$4,000 per charge point may be provided, or up to 75% of capital and installation costs. Greater clarity on the details of funding eligibility is expected when the funding call is announced.

Community Wide Charging Infrastructure Plan

The charging infrastructure plan would identify the broader strategy and contextual overview of potential charging infrastructure throughout Richmond. Issues such as suggested charging stations and number of charge points per station throughout the City including office, retail, public spaces, commercial and others would be part of this plan. This could include partnerships or other support to encourage installation of charging infrastructure at key businesses. The plan would be developed by retaining a consultant who would work with an inter-departmental staff team.

There are a number of best practices and considerations which would be addressed within the plan:

- To provide a greater level of confidence to electric vehicle commuters, the general best practice of 1 charge point per every 5 km of major road network is suggested.
- Locating charging infrastructure at signature sites, high pedestrian traffic areas and at locations highly visible from major roads is recommended for effective marketing and charging. Optimizing business locations and park and rides is another consideration. Key criteria relating to population density, destinations (employment, retail, community service centres), visibility and range (even distribution, major corridors), etc. are all issues which will be addressed.
- Security issues – including measures to prevent potential wire theft, vandalism, or other damage to charging infrastructure.
- Charging capacity. While the provincial funding grant targets Level 2 charging stations for communities, the plan would also address whether a fast-charge station (Level 3) might be appropriate at certain locations, i.e. City Centre, No. 5 Road/Steveston area, etc. Staff note that while the costs for Level 3 charging stations are notably high at this time, they are expected to reduce substantially or by as much as one-half. By planning early, the City can be prepared for any potential Level 3 stations once the price point makes this a cost-effective installation.
- Fees and incentives associated with charging services. There are legal limitations on the resale of electricity. As such, another category of fee would need to be identified (i.e. a parking fee) should the City wish to consider cost recovery. Alternatively, no fees could be applied. The City could also look to provide incentives (i.e. preferred parking). As part of this, it may be necessary to establish maximum time limits to allow greater access to the charge points. These issues would all be explored as part of the planning work. For example, as part of ensuring security of the charging infrastructure, it may involve collection of a deposit to allow access to the charging unit, which is immediately refunded once the plug and associated equipment is securely restored.

In addition to the issues identified above, the plan would also include practical installation guidelines and templates to provide for efficient installation of charging infrastructure. Potential business and funding models for installation would also be identified.

Information from this planning work could be incorporated into the City's broader mobility objectives per the City's sustainability framework and green fleet management strategy (e.g., targets could be set for both civic and community-wide electrical vehicle charging stations).

Regional Infrastructure Charging Network Planning

In addition to the planning work outlined in the previous section, Metro Vancouver has also canvassed municipal interest in a funding application to undertake regional planning work including mapping, education, detailed costing and other related planning activities which would

complement and support the Richmond-specific planning work outlined above. Richmond staff have advised Metro Vancouver of our interest in participating in the proposed regional planning work since it would service to complement our local planning efforts (regional mapping, shared educational resources, technical support to businesses, etc.).

Initial Community Charging Infrastructure Points

In order to kick-start installation of Level 2 charge points at key areas throughout the City, it is suggested that staff begin project planning for the installation of four charging locations at key City facilities, including potentially:

- City Hall or City Hall Precinct
- Steveston Community Centre and/or Garry Point
- Hamilton or Cambie Community Centre
- Thompson Community Centre

As part of this, staff would ensure consultation and involvement with community association and/or School District staff.

By fast tracking work on these Level 2 charge points, staff would be in a ready position to apply for funding and have key details such as specific installation locations, number of charge points per station and preliminary security features scoped out. These locations could also serve as pilots to work through any challenges and help to gauge uptake/demand. Installation of these Level 2 charge points could also serve as showcase initiatives, demonstrating City Council's leadership role in helping to promote community use of low emission vehicles and as part of meeting Council's community ghg emission reduction targets (e.g. 33% reduction from 2007 levels by 2020 and 80% reduction by 2050).

In addition to the proposed project to install charge points at City facilities, it should be noted that the provision of electric vehicle charging stations is also actively being incorporated into development requirements as one of the Transportation Demand (TDM) measures. Over the last few years, several major developments have committed to equipping 10%-30% of the on-site parking spaces with 120V (Level 1) and 240V (Level 2) electric service for vehicle plug-ins with conduits, circuit breakers, wiring (actual outlets to be provided later by strata owners) which will result in a total of 660 parking stalls capable of being retrofitted readily as individual charging stations. As part of the OCP update, it is expected that the provision of electric vehicle stations would be included as a new OCP policy so that electric vehicle stations would be incorporated as part of standard requirements in all future major developments.

Funding Plan

The estimated cost of the infrastructure plan and installation project is \$90,000. An additional level funding submission for this amount will be submitted for Council's consideration as part of 2011 surplus allocation. If the City is successful in obtaining provincial funding associated with

this program and depending on the level of funding provided, between \$20,000-\$36,000 could be rebated through grants.

Should surplus funding not be approved the City would not be bound by the grant program.

Financial Impact

None. Should Council support the staff recommendations, staff will have the authority and support required to submit a grant funding application.

Conclusion

Provincial funding opportunities are being made available to residents, local governments, businesses and institutions to foster growth in clean energy vehicles to help meet provincial emission reduction targets. A new funding call under the Community Infrastructure Charging Program for the development of approximately 285 charging points in Metro Vancouver is expected to be issued shortly, to be managed by the Fraser Basin Council. This report presents a proposed submission that would include a community wide charging infrastructure plan, as well as initial installation of four electric vehicle charging infrastructure stations at City-owned facilities. It is proposed that the City seek grant funding through the Fraser Basin Council to offset a portion of the cost of this work.

The City has undertaken a number of measures to acquire fuel efficient vehicles, including the recent acquisition of three electric vehicles. The planning and infrastructure project as outlined in this report would further showcase the City's leadership role in promoting sustainable transportation choices in the community and supporting progress toward Council adopted sustainability targets.



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SJB: