

Synopsis of Ontario Considerations Stemming from:

“Assessment of Plug-in Electric Vehicle Integration with ISO/RTO Systems.”

Background:

On March 23rd the ISO/RTO¹ Council (the “IRC”) publicly released a report entitled “*Assessment of Plug-in Electric Vehicle Integration with ISO/RTO Systems.*” This report² is available on the IRC website at the following link:

http://www.isorto.org/atf/cf/%7B5B4E85C6-7EAC-40A0-8DC3-003829518EBD%7D/IRC_Report_Assessment_of_Plug-in_Electric_Vehicle_Integration_with_ISO-RTO_Systems_03232010.pdf

This document provides a brief synopsis of the IRC paper, and more particularly, various issues that may be of relevance to Ontario’s adoption of Plug-in Electric Vehicles (PEVs).

Scope of the IRC Report:

The IRC report includes:

- An overview to PEV technology, forecasts of PEV adoption in North America and the attendant scenarios for electrical load growth over that timeframe;
- A discussion of the nature of the interface between PEVs and ISO/RTO systems and the “aggregator” role in that interface. The aggregator role is discussed in generic terms and leaves the possibility open as to whether or not this role is fulfilled by a utility company and/or various third part service providers.
- Communications, technological and logistical needs of the PEV interface to ISO/RTO systems.
- Suggestion for various wholesale electricity market trading products that could enhance the PEV value chain.

The scope of the IRC report does NOT include such topics as:

- Vehicle-to-consumer information interfaces;
- Vehicle-to-distribution grid interfaces (although they are briefly discussed from a standards perspective and in the assumptions about load growth forecasts);
- Broader government policies to stimulate adoption, investment and R&D activities with respect to PEVs;

¹ “ISO”: Independent System Operator “RTO”: Regional Transmission Organizations

² KEMA consulting and IRC, “*Assessment of Plug-in Electric Vehicle Integration with ISO/RTO Systems*”, March 2010

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- Aggregator-to-consumer information interfaces and commercial relationships (although the report does have strong implications for these topic areas).

Outcomes and Recommendations of the IRC report³:

- ISO/RTOs in North America will need to prepare for over 1 million PEVs in the next 5 to 10 years with a particular concentration in major city centres. This could have an impact on wholesale market prices ranging from 0% to 10% - depending on the timing, length and coordination of PEV charging cycles.
- Various wholesale market products could help mitigate wholesale market price impacts of PEVs and at the same time bring about operational benefits and market efficiencies. In the near-term these products could include Emergency Load Curtailment, Dynamic Pricing, and Enhanced Aggregation – all of which are described in detail in the paper.
- Over the longer term, PEVs could also provide regulation and operating reserve volumes to wholesale markets. Again, the aggregator interface to the ISO/RTO systems plays a pivotal role in that regard.

IESO staff observations - Critical, Ontario issues raised by the paper:

- 1) **Roles and Responsibilities:** The IRC paper highlights the vital importance of an aggregator role in the successful adoption of PEV's. However, this role has several aspects ranging from communication of reliability-related data to competitive consumer products. Which of these aspects is best suited to the natural monopoly of local distribution company? Which business activities are better served by a competitive marketplace? What regulatory authorities and licencing conditions are required in this new area of activity?
- 2) **Market Participation:** Do PEV aggregation/integration services constitute a new type of electricity market participation in Ontario – or can existing notions of “market participant” be applied? The SGF has previously indicated an interest in the role of the *IESO Market Rules* in facilitating smart grid development. The PEV integration issue warrants consideration in that regard.
- 3) **Canadian PEV growth projections:** Canadian PEV growth projections contained in the IRC paper are merely extrapolations of the U.S. model used by the report and therefore assumptions about the quality of these projections should err on the side of caution. A study currently being carried out by the University of Waterloo in conjunction with the Ontario Centres of Excellence Plug 'N Drive Partnership should be able to shed more light on Ontario PEV projections in the near future.
- 4) **Rigorous Canadian Revenue Metering Standards:** The smart metering experience in Ontario has shown that Measurement Canada rigorously applies its existing revenue metering requirements on **all** commercial activities involving the sale of electricity. How will this carry over to electric vehicle charging? Will Canadian standards require special considerations beyond those of our neighbours to the south? While the vehicle-to-grid interface was not the

³ See also, “Assessment of Plug-in Electric Vehicle Integration with ISO/RTO System” pages 7 to 11

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main subject of the IRC report, it is a critical element of the PEV value chain that may warrant special consideration from an Ontario standpoint.

- 5) **Early pilot projects:** Several public sector and fleet vehicle pilot projects are being planned in Ontario in the next couple of years. Are there aspects wholesale market/systems integration that should be put to the test in these early pilot projects?

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