Driving forward: Is the grid ready for electric vehicles in Canada?

December 13, 2023

Both the energy and automotive sectors have experienced significant change, creating new *This article is based on BLG's automotive industry seminar, held on Sept. 21, 2023, for an audience that included industry representatives from original equipment manufacturers to engineers specializing in energy systems.*

Both the energy and automotive sectors have experienced significant change, creating new opportunities for integration and collaboration. This article explores the evolving relationship between these two sectors, examining key factors such as clean energy regulations, decarbonization efforts, incentives, and the role of electric vehicles (EVs). It is based on a conversation between BLG's Sarah Diebel, Dave Devereaux, Director of Resource Planning at Ontario's Independent Electricity System Operator (IESO), and Bonnie Hiltz, Vice President and Energy Practice Group Lead at Sussex Strategy. Their discussion sheds light on how these sectors are connecting and helps answer the question: is the grid ready for electric vehicles in Canada?

The clean energy revolution

We are living in times of eco-consciousness, where governments are setting aggressive policy targets to decarbonize, and positive consumer demand trends are accelerating clean-tech investment.

A driving force behind the integration of the energy and automotive sectors is the clean energy revolution. New federal regulations are pushing both sectors to adopt cleaner and more sustainable practices. These regulations have a particular focus on decarbonization, which is a hot topic in provinces such as Ontario. The perspectives on this transformation are multifaceted, encompassing both the industrial and consumer sides.

The Canadian government is setting targets to decarbonize. The two targets frequently talked about are:

1. Canada will achieve net-zero electricity supply by 2035.
2. Canada will achieve a net-zero economy by 2050.

To meet these targets, Canada needs new and sustained investment in electric vehicles, including government subsidies and incentives. This promises to integrate, transform and disrupt both the automotive and energy sectors. But what do increasing numbers of electric vehicles mean for the grid? And what impact will EVs have on decarbonization?

Decarbonization and the electric vehicle space

The IESO's David Devereaux likens IESO to an air traffic controller for the energy system, controlling Ontario's energy grid in real-time and ensuring there's enough power to meet supply and demand. Interconnected electricity systems, like the massive North American grid, provide stability and opportunities for buying and selling electricity across regions.

In their role as planners and system operators of the Ontario electricity market, the IESO publishes an Annual Planning Outlook which shares a 20-year advanced forecast for electricity supply and demand in the province.

The demand for electricity is expected to increase by nearly two per cent each year, driven by factors such as population growth, greenhouse operations and the transition to electric vehicles. The largest anticipated source of new load growth is in electric vehicle charging, which is predicted to increase from less than half a per cent of Ontario's annual energy use today to 15 per cent of our annual electric energy use by 2042. This will require transformative changes to infrastructure and will give rise to new residential and commercial consumption patters.

Why does the automotive sector care about electricity?

According to Bonnie Hiltz, the intersection between public policy and electricity policy is driven by a need for clean energy. Auto manufacturers, too, are looking at the electricity grid differently. In the past, the focus has been on low-cost reliable electricity supply. Today, manufacturers are concerned about the carbon footprint of electricity production and are increasingly seeking emissions-free sources of electricity supply.

While Canada boasts a clean grid compared to most countries, regional variations exist, with some provinces relying more heavily on fossil fuels than others. Achieving decarbonization in such regions presents unique challenges.

The automotive sector plays a crucial role in decarbonization, by enabling the transition to a reliable and clean electricity supply for the vehicles it produces. But vehicles won't be the only consumers of electricity. Decarbonization will require many transformative solutions for processes that previously relied on fossil fuels to switch to electricity.

The rapid transformation required to facilitate the transition to electric vehicles and broader zero-emissions decarbonization objectives will be enabled by the alignment of subsidies and incentives across the electricity and automotive sectors, as well as across jurisdictions. New and sustained investment is needed to accelerate and disrupt current

supply chains and services from manufacturers and suppliers, to lenders, EV dealers, energy providers and charging station operators.

What's next for the energy and automotive sectors

The new edition of the IEA's annual Global Electric Vehicle Outlook shows that more than 10 million electric cars were sold worldwide in 2022 and that sales are expected to grow by another 35 per cent in 2023 to reach 14 million.

Electrification of vehicles is an industry transformation taking place at unprecedented speed. It is also complex. Players in the energy, infrastructure, mobility and automotive sectors are increasingly intertwined as they navigate the challenges and opportunities presented by clean energy regulations and decarbonization efforts. To achieve the federal decarbonization targets and ensure a cleaner and more sustainable future, it's crucial for these sectors to collaborate, innovate and adapt.

In this journey, stakeholders, suppliers, lenders and operators must be prepared to invest in new infrastructure and adapt to a rapidly changing ecosystem.

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