

Getting out in front of EVs



Canadians are buying electric vehicles (EVs) in record numbers. Are power and utilities organizations ready for the change that will bring? And are investors ready for the opportunities that might emerge?

In 2017, Canadians bought more electric vehicles than ever before – sales of EVs shot up 68 percent year-over-year. There are now more than 50,000 EVs on the road in Canada and that number is growing steadily each month.¹

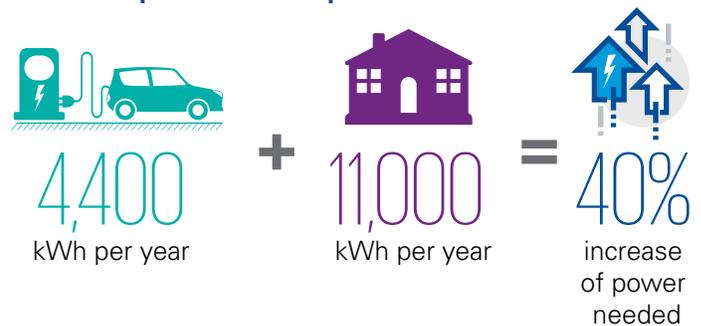
In part, that is because costs for EV ownership and maintenance is falling rapidly. EVs are already cheaper than combustion-engine vehicles to run (according to a recent report by the University of Michigan, fueling up an EV may cost half as much as a gas-run car each year).² Bloomberg reports that EVs will also be less expensive to buy than combustion-engine cars by 2025.³

It doesn't hurt that EVs enjoy super-star status in Canada – not only because Canadians seem to be more environmentally conscious than many other nations, but also because EVs are seen as being 'cool' vehicles to own. And the fact that many Canadians can get generous provincial rebates for purchase makes the value proposition for EVs even stronger⁴.

Demanding attention

While this is all terrific news for the environment, it creates massive challenges for the power and utilities sector. One of the biggest problems is how to manage the increase in demand. Consider this: a 2018 model EV, getting its official mileage, would guzzle up around 4,400 kWh of electricity each year⁵. Canadian households are estimated to use around 11,000 kWh per year⁶. So adding one EV per household would increase demand by more than 40 percent (remember, though, that in 2009 there was an average of about 1.5 cars per household in Canada⁷).

Estimated power demand per household



1. <https://www.fleetcarma.com/electric-vehicle-sales-canada-2017/>

2. <https://www.forbes.com/sites/jeffmcmahon/2018/01/14/electric-vehicles-cost-less-than-half-as-much-to-drive/#fdaeb2d3f973>

3. <https://www.bloomberg.com/news/articles/2018-03-22/electric-cars-may-be-cheaper-than-gas-guzzlers-in-seven-years>

4. <https://emc-mec.ca/ev-101/ev-incentives/>

5. Based on an EPA rating of 30kWh per 100 miles (source: <https://www.fueleconomy.gov/feg/Find.do?action=sbs&id=39860>) and assuming an average annual travelling distance of around 25,000 kilometers

6. <https://www.statcan.gc.ca/pub/11-526-s/2010001/t004-eng.htm>

7. *Canadian Vehicle Survey 2009 Summary Report*, Natural Resources Canada, 2009

The other big problem is managing the type and timing of demand. One might naturally expect that – at the end of the workday – EV owners will be coming home and plugging in their cars. The stress on the network at 5pm could be significant. On the flip side, EV cars could also serve as stores of power for households which, if managed properly, could help alleviate stress on the grid, particularly at peak hours.

A capital challenge

What is clear is that Canadian power and utilities organizations need to start planning and acting now if they hope to respond to this challenge without major service interruptions. And they need to be thinking holistically – the implications of EVs will influence both generation and distribution alike.

Generation capacity will clearly need to rise to meet growing demand. Distributed power models will certainly add some capacity to the grid. But even if every EV owner added a residential solar array to their home, it still wouldn't be enough to completely recharge their car (using current technologies, of course). Distributed power is only part of the solution.

Distribution networks will also need significant asset renewal and expansion. There are many neighborhoods in Canada where the addition of just a few EVs would likely blow the transformers. Adding thousands of super-chargers to the network would create unprecedented stress on existing distribution assets.

What that means is that, for both generation and distribution, much more investment will be required. If you're an energy producer or distributor, you're going to need some pretty significant capital investments to get through the next decade or two. And you're going to need some very strategic planning.

A new paradigm

But take heart; the shift to EVs is also creating new opportunities for both energy companies and investors. In some jurisdictions, authorities are already starting to explore how they might use Public Private Partnership models to help drive the new asset development and renewal efforts that will be required. Investors are starting to think seriously about this new potential field of investment.

The adoption of EVs is also inspiring some investors and energy authorities to think much more broadly about energy use in the future. And they are coming up with some very interesting new use cases and value propositions.

How, for example, could parking lots be used to balance peak demand? The Oshawa Go Station in Toronto houses 2,250 cars and the 2018 model EV can hold up to 25-30 kWh in its battery⁸. How can that massive store of power be leveraged? In the UK, there's already at least one energy company offering customers

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'free EV charging' if they allow them to draw from their EVs battery during peak hours and recharge it during off hours.⁹ What might that look like at an industrial scale – at the Oshawa Go Station, for example – and what opportunities would that create for investment?

A public matter

The rise of EVs will also create new challenges and opportunities for government. Infrastructure planners will need to start thinking about how these changes in energy demand might influence future infrastructure development. Where will energy be used in the future? Where will it be created? And what does that mean for infrastructure planning, prioritization and investment.

Policy makers and regulators will also need to think seriously about how they can support and manage the shift to EVs. Some new regulation will certainly be required to encourage greater fluidity within the network and grid. Ensuring that the generators and distributors have the right regulation and support to engage in PPPs will also be critical.

Ministries of Transport and Energy will also need to start thinking and planning much more collaboratively to ensure alignment between the rise in EVs and the rise in generation capacity and distribution capability. Creating the right encouragements in the right elements at the right time will be key.

Time to gear up

The bottom line is that EVs are coming to Canadian cities and their adoption will have massive implications for our local power and utility companies. Yes, there will be risks and disruption, but there will also be significant opportunity.

Not to be too alarmist, but I believe that the long-term stability and success of our energy system depends, in large part, on how we respond to this challenge. And we have little time to waste – the EVs are already in the fast lane.

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8. <https://www.powerstream.ca/innovation/electric-vehicles-and-charging-stations.html>

9. <https://www.theguardian.com/business/2017/oct/02/electric-car-battery-savings-nissan-leaf-ovo>