MITL Symposium
November 29 2018

LDC 2.0
EVs, DER, Transactive Energy

Dan Guatto, P. Eng.
COO
VP Engineering and Operations
<table>
<thead>
<tr>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changing Consumers</td>
</tr>
<tr>
<td>Decarbonization</td>
</tr>
<tr>
<td>Transportation Electrification</td>
</tr>
<tr>
<td>Other DERs</td>
</tr>
<tr>
<td>Transactive Energy</td>
</tr>
</tbody>
</table>

We know the future... and so do you
The customer we have is not satisfied with the status quo.

Customers are driving change at the political level (e.g. Fair Hydro Plan in Ontario).

By 2030 self generation will be cost effective compared to grid power, so customers will have the choice to go off-grid.

Developers are offering alternative energy suppliers – the UK example.

Customers of all classes are requesting new services, like ride-through.

If our customer base changes significantly, how will that impact our operating models?
Planning today for tomorrow

This move to a more distributed, cleaner and intelligent energy system requires the transformation of the utility business model.
Comparing Carbon Intensity

Source: electricityMap API
Global Trends: Manufacturers

- Chinese-owned carmaker Volvo said in July 2017 that all its new car models would have an electric motor from 2019.
- Germany’s BMW is gearing up to mass produce EVs by 2020 and committed to having 12 all-electric and 13 hybrids in its lineup by 2025.
- Volkswagen AG secured $25 billion in battery supplies and will equip 16 of its factories to produce EVs by the end of 2022 (more than 3 million EVs).
Mercedes-Benz released a plan in 2018 to build EVs at 6 factories across 3 continents and a “global battery network” to support the effort.

“Electric mobility is a bit like the ketchup bottle. You know that it is coming, but not when or how much“.

*Dieter Zetsche, Head of Mercedes-Benz*

Local Distribution Companies need to be ready.
Residential EV Charging

Residential On-Peak Demand is typically
4 to 6 kW
(Multi-res 2.5 to 3 kW)

EV Charging at Level II
(240V @ 32A) means
7.7 kW is available
### Intelligent Charging – Usage Summary

Average charging rate of **6.4 kW**

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Ontario: 2018 EV Usage

150 MWh of EV capacity added in June
25 MW of EV residential load added in June
160 MW of EV public fast charging added in June
Multi-Residential EV Charging:
New Buildings
EV Charging & Other DER

- Artificially intelligent controller (grid interface) learns behavior patterns and optimizes energy flows
- Nano amounts of solar and stationary storage
- EV – significant load and significant storage
- Smart appliances, LED lighting
LDC 2.0

- Customers enroll
- LDC acts as FINO (Fully Integrated Network Orchestrator) aggregates and manages responsive assets
- IESO provides price signal, requests DM
- Transparent to end user
- Customer gets ride-through (no outages on critical circuits)
- Financial benefits to customer, LDC and IESO
Benefits to Customer

- Optimized cost through alignment of surplus energy with load
- Elimination of outages
- Environmental and health benefits
- Automated process – no need for consumers to become knowledgeable about energy or the optimization process
- V2B or V2G? Maybe...
Benefits to the Grid

- Reduction in peak demand
- Directly replace next-day on-peak generation with surplus energy from the previous day
- Avoid unnecessary capacity increases to assets
- Existing grid assets can serve more customers
- Five-minute-ahead DR and other grid stabilization services
LDC 2.0 Transactive Energy

Bi-directional Metering and Distribution System
Thank You!

Dan Guatto, P. Eng.
COO
VP Engineering and Operations
Burlington Hydro Electric Inc.
E: dguatto@burlingtonhydro.com
M: 416 937 2872