Transmission and Distribution Grid Services of the Future

October 13, 2021

How Customer Demand is Driving the Integration of Distributed Energy Resources (DER)

The Future of Energy Is Here

The energy sector is undergoing a historic transformation, driven by government policy, market forces and customer needs.

Governments and Canadian businesses are setting ambitious net-zero by 2050 targets.

Green infrastructure investments and decarbonization programs are getting established across Canada to accelerate the energy transition.

Electrification of transportation is accelerating with potentially ~1M EVs on Ontario roads by 2030.

Established industries are entering the “behind the meter” space, and utilities are responding by expanding their service offerings beyond the commodity.

Canada Net-Zero Emissions by 2050

Ford deal to build electric cars in Oakville comes amid $500M government cash to upgrade plant

Electrification of transportation will change the utility business

ArcelorMittal Dofasco getting $400M from Ottawa to cut greenhouse gas emissions

RBC adds $500-billion to funds earmarked for net-zero carbon goal

GM Accelerates Electrification Timeline, Plans 30 EVs by 2025

Brookfield Pursues $7.5 Billion Fund Devoted to ‘Net-Zero’ Shift

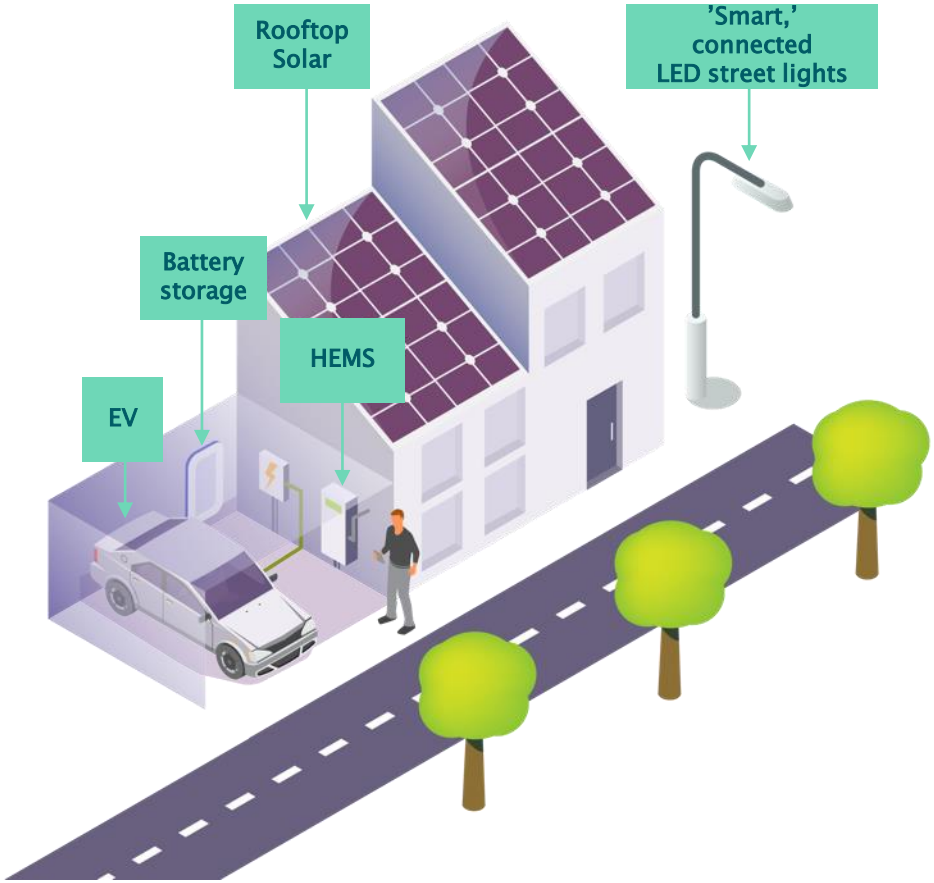
Customer Needs Are Changing

Rapid advances in technology, paired with heightened concern for climate change and sustainability are shaping customer needs and expectations.

In addition to affordable and reliable energy supply, customers across all segments are increasingly demanding clean, low-carbon solutions.

Extreme weather events, caused by climate change, present a threat to reliability, and customers are looking for resilient backup to avoid or mitigate outages.

The electrification of transportation and heating across all customer segments is driving the demand for electricity and need for infrastructure investments in the grid.



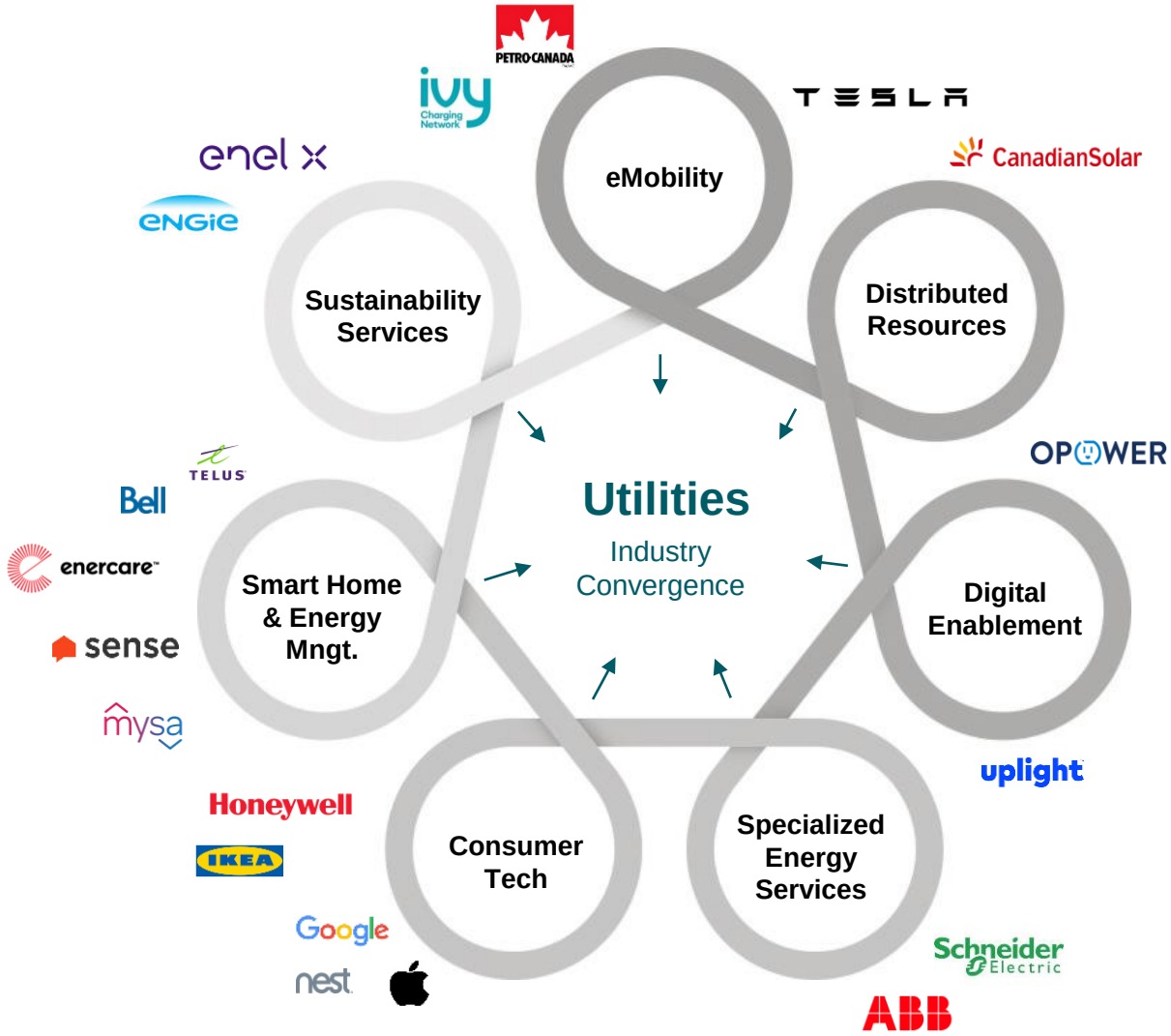
Utilities Are at the Center of Electrification

Utilities are uniquely positioned to lead the energy transition and enable a path towards a sustainable and prosperous economy.

Electricity providers need to adapt their service model to embrace new opportunities and create additional value for customers.

To keep electricity affordable and enable customer choice for sustainable and reliable energy supply, utilities need to invest in grid modernization and a smarter grid.

Solutions to electrification will require fully integrated Distributed Energy Resources (DERs), such as renewable generation and battery storage, to optimize capacity on the grid and enable customer goals.



Barriers to DER Integration

DERs are critical to electrification. Yet, regulated utilities face a number of system design and regulatory barriers regarding their integration.

Substantial grid modernization and system upgrades are required to enable DER integration that optimizes capacity on the grid and supports customer choice.

On the regulatory side, fundamental questions, such as *What is a DER? Who can own it? Who can operate it? Who pays?,* are still being discussed with the regulator.

Currently, regulated utilities are restricted in how they can use DERs. Except for reliability purposes, DERs can only be placed “before the meter”. However, the total value of a DER is much bigger “behind the meter”, the closer it gets to the customer.

Battery Energy Storage Value Chain, Upstream Portion: Utility-Scale and BTM