Standing Committee on Natural Resources Strategic Electricity Inter-Ties

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S&C Electric is an employee-owned global manufacturer of electrical systems for utilities, headquartered in Chicago with a major plant in Toronto and offices throughout Canada. In 1909, over a century ago, the founders of S&C developed an extremely reliable power fuse to enable the safe operation of high-voltage transmission lines, heralding a new era in the industry.

Ironically, over the last decade, S&C has implemented dozens of utility-scale energy storage systems throughout the world, allowing utilities to defer or even to avoid investing in new transmission and distribution lines. In Canada, we are a leading member Energy Storage Canada, the industry association working to expand the use of energy storage in Canada.

This new reality is in stark contrast with the old electricity grid. The old grid has large generation stations away from users, requiring long transmission lines to bring electricity to where it is being used. Those transmission lines often take 15 or 20 years from inception to operation, use vast areas of land, disparage landscape and are generally opposed by local communities.

In the modern grid, electricity is being generated from renewable sources, such as solar and wind, distributed across the grid near users of electricity. Energy storage systems accumulate electricity when the sun is shining or the wind blowing, releasing it at time of use. Electric vehicles are charged during the day, and can even give power back to the grid if needed. Distributed, utility-scale renewable energy sources and storage make use of existing grid assets, without the large environmental impact of transmission lines.

The reality of the new electricity grid stems from major investments and innovations that have been made across the world in designing and implementing renewable generation and energy storage systems, including electric vehicles. As a result, the price of renewable sources and energy storage technologies is decreasing at double-digit rates per year and they are getting increasingly competitive as the industry is scaling up manufacturing and learning how to better integrate those systems.

Wind, solar and storage are not only becoming cost effective, but doing so at a much smaller scale than traditional generation. Renewable generation and energy storage systems are therefore being installed deep in the electrical grid, at its edge or even behind the meters. The traditional and centralized grid is being transformed into a digital grid of microgrids integrated to local energy resources. Just like personal computers and the Internet replaced mainframe computers, the new grid of distributed energy resources is replacing the centralized old grid.

The new, distributed and digital-enabled electrical grid is also more resilient to extreme weather events because it relies on multiple and alternate energy sources and paths. This new resilience is welcomed, as residential and industrial customers are increasingly dependent on electricity to power our modern life in smart communities and with the advent of electrical transportation.

What is even more dramatic is that those innovations are shaking a pillar of the Canadian economy. The electric industry touches every home and business in Canada and reliable power is an essential ingredient for the competitiveness of our economy. Electric power generation, transmission and distribution utilities contribute almost $30 billion to the Canadian economy, with electrical equipment manufacturers contributing another $4 billion. This industry employs over 100,000 Canadians. Canada's net exports of electricity and electrical products amount to billions of dollars every year. The importance of the electric industry scales up the potential of wealth creation if the right investment decisions are made, but also underlines the perils that we are facing: should the Canadian electric industry fail to renew itself for the challenges of the 21st century, the entire economy of Canada would suffer.

Canadians should be inspired by how other countries are building this new electricity grid. For example, a utility-scale energy storage system at a substation in Leighton Buzzard, 50 km outside London in the United Kingdom, allowed the utility there to avoid building a 20-km underground line. With this technology and others, as well as a regulatory regime that incites utilities to perform better, UK communities enjoy an electrical grid that is 4 times more reliable than Canada's.

In conclusion, accelerating the transformation of the Canadian electric industry is essential. In an industry traditionally defined by centralized generation and rigid geographic boundaries between utilities, new linkages need to occur: utilities and customers, vendors and entrepreneurs, cities and businesses, ensuring that all see the opportunities that didn't exist before and have the support they need to get their ideas to market quickly. The transformation of the electric industry will ensure that Canadians benefit from the billions of dollars already invested in the electricity system. The structure of the industry will emerge transformed, with Canadian-owned service providers offering novel energy solutions in Canada, backed by a web of hardware, software, and professional service vendors. This will increase the opportunities for Canadians to export their energy, their expertise, and the fruit of their labor.

Now is a time of innovation in the electric industry, like no other since Thomas Edison.

Now is the time when wealth can be created as we use our collective resources and brains to ensure a resilient and sustainable energy future for all.

Let's make collective investments in an infrastructure that is built for the next century, not for the last one.

Exhibits

In 1909, S&C's high-voltage fuse heralded a new era of safe operations of high-voltage transmission lines.

The S&C energy storage system in Leighton Buzzard, near London, UK, avoided construction of a 20-km underground transmission line.

The cost of utility-scale renewable generation and energy storage systems have been declining at over 20% per year, fueled by increasing scale of manufacturing, larger installations and better integration. This trend is expected to continue for the foreseeable future.