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THE CHALLENGES AND BENEFITS OF DISTRIBUTED ENERGY RESOURCES (DER) FOR MUNICIPALITIES

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The growing interest in, and deployment of, distributed energy resources ("DER") has been thought to be of interest, albeit for different reasons, primarily to consumers and to local electricity distribution utilities. However, DER has important implications for municipalities, both in their capacity as the owners of those distribution utilities and as a means to promote both conservation and the development of contaminated properties.

DER is a term which covers power generation and storage resources, of varying sizes, types and capacity. DER is typically found on a consumer's premises and is used to supply all, or a portion of, the consumer's electricity load. Depending on the size and capacity of the DER technology used, it may also be able to supply excess power to the utility grid.

DER includes a variety of technologies, including solar, combined heat and power, microgrids, wind turbines, gas-fired micro turbines, back-up generation and energy storage.

The scale of the use of DER can extend from a single residence, business or institution, to an entire neighbourhood or subdivision.

The cost of DER technology varies, again depending on size and capacity. However, cost is not the only factor influencing the decision to deploy DER. The value of DER for the consumer includes resiliency, reliability, bill reduction, security, and the impact on the reduction in greenhouse gases ("GHG"). Resiliency and reliability are particularly important for some larger institutional consumers such as hospitals.

The development and deployment of DER technology is frequently discussed in terms of the potential adverse impact on distribution utilities. Material reductions in the amount of electricity distributed have an impact on the revenues of those utilities. Reductions in revenue in turn make it more difficult for utilities to invest in the infrastructure necessary to maintain the distribution grid. The widespread deployment of DER technologies might, in the worst-case scenario, lead to the stranding of assets, with the consequence that utilities would be unable to recoup the cost of their investment.

Since the costs of developing and maintaining the utility grid must be borne by all consumers, those consumers who are able to reduce their load or leave the grid altogether through the use of DER impose additional costs on others who are unable to do so. Those costs might then have to be borne by consumers who are less able to deploy DER technologies. The deployment of DER thus has implications for considerations of social equity.

The perception has been that a combination of rapid developments in DER technology and surging consumer demand will, by itself, drive the deployment of DER. However, as the experts on a panel at a recent conference of the Council for Clean and Reliable Electricity pointed out,

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the examples of DER deployment to date suggest that the nature and pace of deployment is a function of more than just technological development and consumer demand. It is influenced by the presence of subsidies and incentives, from a variety of sources, as well as by the willingness of local distribution utilities to participate. That said, those experts did agree that we are perhaps one major technological development, for example in energy storage, away from a potentially destabilizing surge in consumer demand and DER deployment.

The widespread deployment of DER is a threat to distribution utilities, and to their municipal owners. At the same time, the deployment of DER provides opportunities, and potential benefits, to those municipalities.

Since the restructuring of the electricity distribution market, in the late 1990s, when municipalities became the owners of utilities entitled to earn a return on equity, those utilities have become an important, and predictable, source of revenue for municipalities. Should the utilities face a material decline in revenue, as a result of the deployment of DER, that predictable stream of revenue would be threatened. It is, therefore, important that municipalities be aware of the extent of DER deployment and of how their utilities are responding to it.

In the longer term, the role of local distribution electricity utilities may have to change in fundamental ways in response to consumer demand and the deployment of DER. The provincial government has anticipated such changes through recent changes to the Ontario Energy Board Act. These changes allow the affiliates of those utilities to engage in any business activity and allow the utilities themselves to apply for permission to broaden the range of their business activities. Such changes may well increase the risk profile of the traditional, and relatively low risk, utility business. Because of that, municipalities must pay close attention to the changes in business models their utilities propose to adopt.

In the near term, one possible response to the deployment of DER would be for the municipal owners to encourage the utility to participate in the deployment of DER by, for example, encouraging utility participation in the development of microgrids for new subdivisions. A second possible response would be to ensure that the utilities themselves use DER to optimize the operation of the grid and defer capital investment.

The deployment of DER also offers potential direct benefits to municipalities. Depending on the technology used, DER can contribute to a reduction in GHG. Municipalities may be interested in the deployment of DER as a way to meet their own GHG emissions reduction targets.

Finally, the deployment of DER may be used as a means to develop contaminated or vacant properties within municipalities.

It is, thus, important for municipalities to be aware of the challenges and opportunities presented by DER technologies and their deployment. It is also critically important that the governance structure of the utilities allow municipalities to be aware of, and to the extent necessary control, the activities of the utilities they own.

** The contents of this paper reflect, in part, observations made by Paul Murphy, Dr. Dan McGillivray and Paul Sommerville at a recent conference of the Council for Clean and Reliable Electricity.*

ENERGY PRACTICE

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