

Enabling the Smart Grid We Need

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It's Time to Get Real about What Smart Grid Enablement will Require

The discussion around the promise of smart grid enablement in Ontario has often sounded too much like a far off discussion about a wonderful and connected future where new, cleaner and greener power sources connect seamlessly over a dynamic and intelligent power grid system. The Ontario Power Authority's (OPA) Integrated Power System Plan shares this tone when it talks about making the system "greener, cleaner and smarter."

The reality is that the need for that future grid system is not in some distant future, but something that we need to begin creating and facilitating today. Ontario has become recognized as a jurisdiction that has aggressively pursued the expansion of alternative energy generation from wind and solar sources through the province's well known Feed in Tariff (FIT) program.

By their very nature, solar and wind power are intermittent and distributed requiring a grid system that can fully support and integrate these new energy sources into our existing grid system. The problem is that what we have today is far from adequate to address these requirements, and it is difficult to see that we are moving forward on a clear path to remedy this shortfall with a smart grid that is founded on a robust and reliable next-generation communications network.

The need to develop a next-generation communications layer for Ontario's Smart Grid is most easily seen as critical when one considers how much will have to change in the status quo grid system of this province. Currently, Ontario, like many other jurisdictions, operates on a highly centralized management infrastructure that is analog-based, and facilitates a protection and control process that is not only slow but highly dependent upon human interface at an operational level. As we seek to bring new energy sources online that are constantly changing and widely distributed in small increments, it is essential that we move to a grid architecture that is more widely distributed in its command and control processes and is enabled by a decentralized communications infrastructure that can facilitate rapid, automated and segmented grid management and operations control. The current grid needs to evolve into a connected, distributed hub and spoke model that can facilitate rapid, dynamic and automated decision making at the micro grid level, while providing a rich diagnostic capability for central control to set, establish, monitor and augment macro grid management across the province. leadership and innovation or



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face an inevitable 'brain drain' to universities and enterprises that see the enormous business potential of the intelligent energy sector.

Firstly, a distributed grid should be fully IP enabled. IP has been the standard for telecommunications infrastructure for almost 15 years, and is long overdue in the power grid communications layer in Ontario, as well as many other jurisdictions.

As plans for grid modernization unfold in Ontario, it is clear that there are a number of barriers that remain in place, including a lack of commitment to fully cap and replace the current grid architecture versus making adjustments to the existing grid by layering on new technologies and structures to legacy systems.

To be clear, a robust and effective smart grid should come with some simple and definitive characteristics.

Firstly, a distributed grid should be fully IP enabled. IP has been the standard for telecommunications infrastructure for almost 15 years, and is long overdue in the power grid communications layer in Ontario, as well as many other jurisdictions. Trying to create a hybrid approach that is partially analog, partially IP-

based is foolish, and will ultimately serve to limit the potential of the network while increasing the cost of management and deployment. The bottle necks that will naturally and needlessly occur in such a system can be eliminated with a strong commitment to fully replace and retire the analog elements it now contains.

Secondly, an economic solution should be one that mixes both the use of existing network infrastructure with the development of new infrastructure. Achieving best value and cost performance is easier when the answer for communications infrastructure development is not always to fund new builds. Telecommunications companies in this province have invested billions in next-generation network infrastructure that can in many instances be complimentary to or sufficient for the communications needs of a new smart grid. It is certain that new network infrastructure will also need to be built, but funding it with public money should not be the only approach to solving this requirement. Funding this without considering other options risks creating an expensive, underutilized, uneconomic foundation.

Finally, we need to move to a network model that doesn't try to protect the status quo of an antiquated operational process, but instead moves to embrace new standards for efficiency and automation that can ultimately yield true business transformation and benefit for all. Much of what we expect from our power grid is by its very nature mission critical, but we know that other sectors face and meet the same challenges every day and do so using a mix of public and private network solutions. Our utility sector is of great importance and should expect the highest SLA (Service Level Agreement) standards, whether from internal or 3rd party network providers. The solution needs to be scalable to grow as bandwidth demands increase. However, are these network performance standards any different from the expectations that our financial services sector requires? The answer is no, and the sooner we accept this notion in the utility sector and embrace it, the sooner we will be able to make significant strides and stand on the shoulders of technological achievement that other mission critical sectors have already made. Being open to the latest standards of network management and application development will be a big change for the utility sector but one that is vitally necessary if we are to create a system that is truly capable of creating the Smart Grid we require to move forward in this province.

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Let's start the conversation.
Contact us today for more information.