Grid Innovation Fund Announcement Backgrounder – November 10, 2021

Grid Innovation Fund

The Grid Innovation Fund advances innovative opportunities to achieve electricity bill savings for Ontario ratepayers by funding projects that either enable customers to better manage their energy consumption or that reduce the costs associated with maintaining reliable operation of the province's grid. Since its inception in 2006, the IESO's Grid Innovation Fund has supported 230 projects, taking innovative ideas from partners and turning them into knowledge that enables the reliability, effectiveness and resilience of the provincial electricity system.

Distributed Energy Resources

Ontario's electricity system is changing. It used to be a simple matter of large generators transmitting power over long distances down into communities. And while that still happens, the electricity system of today is much more complex.

New technologies, along with more engaged consumers and communities, has led to a much more diverse and decentralized system. This is creating a lot of opportunities for businesses and communities to get involved.

The provincial grid vs. local distribution networks

Ontario's electricity system comprises a provincial grid that spans the province, and many local distribution networks ("local hydros") within it – Hydro Ottawa or Utilities Kingston, for example. While local distribution networks mostly draw power from the provincial grid, there are an increasing number of electricity resources connected directly to local distribution networks.

Local energy

Sources of electricity that are connected to a local distribution system are known as distributed energy resources, or DERs. They can either store or generate electricity, or can adjust their electricity consumption. Examples of DERs include small-scale generation such as solar on rooftops, battery storage and consumers that adjust their energy use based on electricity price and other signals.

These resources make up more than 10 per cent of the province's electricity supply capacity and are growing:

- While only one per cent of Ontario homeowners have installed solar panels, another 11 per cent say they are very likely to do so in the next few years.
- Small business consumers are seeing the potential of pairing solar panels with batteries – with 13 per cent intending to install them within their facilities in the near future. [1]

Benefits of DERs

DERs can contribute to the reliability and affordability of Ontario's electricity system. They give communities more choice in how their growing energy needs are met, and can provide alternatives to traditional electricity infrastructure. Businesses who invest in DERs also have the potential to earn revenue by selling electricity services to the grid.

Two factors are making DERs more cost-effective:

- Innovation is creating new technologies and driving down the cost.
- As electricity supply needs grow increase the years ahead, this provides an opportunity to use DERs as alternatives to new or upgraded transmission and generation infrastructure, or to make room for more businesses to connect to existing infrastructure. This requires technologies and platforms to co-ordinate these resources so that they are aligned with system needs.

How are DERs being used today?

- There are thousands of DERs operating in Ontario – solar panels, batteries and demand response capability that provides supply to local communities. But there is likely more – as businesses increasingly use these technologies for their own needs. This supply eases the need to rely on transmission lines or large power plants to serve local needs.
- Local supply options are already making an impact on the system. For example, the IESO takes advantage of batteries located within distribution networks to provide services that fine-tune frequencies on the system.
- Last year, the IESO launched a pilot project in the Alectra Utilities service area which allows local DERs to compete to provide local supply. The auction attracted wide participation from various different types of participants – including supermarkets, a district energy facility and companies that aggregate home consumers with smart thermostats.

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[1] IPSOS research for the IESO:

- Residential – n=800 Ontario residents aged 18+. (+/- 4.0 percentage points, 19 times out of 20)
- Small Business – n=251 decision-makers at Ontario small businesses (+/- 7.1 percentage points, 19 times out of 20)

The Future of DERs in Ontario

- After a period of strong energy supply, the IESO is forecasting a growing need for new energy sources as nuclear refurbishments and retirements move forward and contracts for existing generators expire. Meeting these emerging needs will require a proactive effort to enable the new kinds of supply options to participate in the Ontario electricity system and market.
- The IESO has embarked on a number of initiatives to better understand the role of DERs and integrate them in the electricity system. This includes building greater co-ordination between provincial grid and distribution networks as well as looking at and addressing the barriers that stand in the way of these energy providers participating in the system. This work is a key focus for the IESO.
- The IESO's Grid Innovation Fund supports projects that either enable customers to better manage their energy consumption or that reduce the costs associated with maintaining reliable operation of the province's grid. Most recently, the IESO issued a targeted call in partnership with the Ontario Energy Board's Innovation Sandbox for submissions to support research and demonstration projects that would test DER capabilities to provide services at both the local and provincial level.
- The work continues with the development of a DER Roadmap engagement which will set out the IESO objectives, initiatives and timing for the integration of DERs in Ontario.