Feedback Form

Grid Innovation Fund (GIF) Engagement Roundtables – December 2025

Feedback Provided by:

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To promote transparency, feedback submitted will be posted on the Grid Innovation Fund engagement page unless otherwise requested by the sender.

- ☐ **Yes – there is confidential information, do not post**
- X **No – comfortable to publish to the IESO web page**

Following the Grid Innovation Fund roundtable discussions, the Independent Electricity System Operator (IESO) is seeking feedback from stakeholders on the items discussed. The presentation can be accessed from the Grid Innovation Fund engagement page.

Note: The IESO will accept additional materials where it may be required to support your rationale provided below. When sending additional materials please indicate if they are confidential.

Please submit feedback to engagement@ieso.ca **by December 24, 2025.**

Innovation Ecosystem in Ontario's Electricity System

Topic 1: Significance of Innovation (slide 15 of presentation)

Why does innovation matter in the electricity system and how can it support the energy transition and evolution of the system?

The electricity system in Ontario is going through a major transformation in order to achieve decarbonization goals, including a significant build-up of variable generation resources (wind and solar) along with a dramatic increase in demand due to electrification in transportation and heating, along with a reduction in the industrial use of fossil fuels. Innovation is crucial to ensure the successful energy transition without compromising grid stability, reliability, and customer satisfaction. Innovation in the electricity system can translate into various aspects, including the use of new technologies (e.g. monitoring data, electrified transportation, renewable generation), adopting new methods based on existing technologies (e.g., formulation of control zones and decentralized control), and novel practices and relationships (e.g., ancillary service design). Hence, innovative efforts can support the energy transition by enabling grid modernization, digitalization, and real-time control, flexible operation schemes, and sector coupling.

Topic 2: Strengths (slide 16 of presentation)

What are the strengths of the current state of innovation in the electricity sector? What is working well?

There are several efforts to integrate innovative approaches in the electricity sector:

Data: The increasing amount of monitoring devices, such as Phasor Measurement Units (PMUs), leads to a vast amount of data that is currently used by power system operators to monitor critical quantities. Several operators in Switzerland (Swissgrid), China (SGCC), Greece (IPTO) rely on Wide-Area Measurement Systems (WAMS), indicating the importance of data but also the possibility to apply data-driven methods for grid stability monitoring. At the IESO, new requirements for PMUs at generation stations, in addition to province-wide individual load data, provide new opportunities to improve the control and operation of the power grid in Ontario.

Decentralized control: In terms of control design, decentralized approaches have been up and running as a robust formulation by actual operators, such as the transmission system operator in France (RTE). In fact, control zones have been well-defined for implementing secondary voltage regulation in many actual transmission systems, including the Spanish and French networks. Furthermore, decentralized control is important in the face of the uncertainty posed by extreme weather events. In particular, when massive outages occur due to flooding or extreme weather events, a rapid and distributed response can greatly increase the resilience of the power network (e.g., allowing for islands to continue operating without direct centralized control).

Decrease in renewable generation and energy storage costs: Costs for renewable generation and energy storage installations have significantly decreased. In fact, renewables can represent the most cost-competitive source of new electricity, with onshore wind and solar PV leading the way. Large

grid-scale batteries and renewable generation farms are now being built faster than ever. Such infrastructure can handle uncertainty in renewable generation and promote flexible operation. Global and national standards organizations, such as IEEE, have made significant innovations in interconnection standards to ensure the rapid increase in inverter-based resources has minimal effect on grid reliability.

Topic 3: Evolution of Innovation (slide 17 of presentation)

Recognizing the electricity system of tomorrow will look different than today's, what support do you feel the innovation sector needs to support the energy transition?

What are the biggest gaps or challenges to advancing innovation in the electricity sector in Ontario?

R&D and collaboration: Strong research and collaborative efforts are essential to advance innovation. The electricity system in Ontario can be at the forefront of innovation by leveraging exchanges with a great number of high-quality academic institutions in the province. Long-lasting academic-industry collaborations can also lead to building a future-ready workforce that has the skills to contribute to the energy transition and the power sector. Hence, it is crucial to sustain funding schemes such as the Grid Innovation Fund (GIF) and promote collaborations with educational institutions. The current GIF framework, due to its legacy focus on demand management and conservation efforts, lacks the broad scope needed to foster innovation throughout the electricity sector, especially in the context of improved control and modeling of the transmission network.

Grid Innovation Fund Governance Framework

Topic 4: Existing Framework (slide 20 of presentation)

From your experience, what would you say has worked well to date with GIF?

The GIF program has the potential to positively affect the growth and financial success of funded organizations, as it can help establish strategic partnerships and research findings useful for securing future funding.

What do you see as potential limitations/risks with the current GIF framework?

The current framework tends to focus on projects with little to no risk, which is likely why much of the funding has been on small- to medium-scale pilots of already-proven technologies. If Ontario wants to be at the forefront of innovation in the electricity sector, more focus on research that is at its initial stages would have the potential for larger benefits, even if the risks are significantly higher. The IESO is much better positioned, in comparison to private Local Distribution Companies (LDCs) and transmission operators, to make bets on the development of new ideas without an immediate payoff, and the GIF would be an ideal avenue for funding truly innovative research.

Topic 5: Current Mandate (slide 21 of presentation)

Do you feel the current mandate is appropriately broad? Too narrow?

The current mandate should be broadened to encompass innovation throughout the Ontario electricity sector, rather than being focused primarily on demand-based solutions.

How could it be refined to better capture the needs of supporting innovation within Ontario's electricity sector?

Ontario's electricity sector relies on the integrated, coordinated operation of transmission, generation, and load (typically via LDCs). Projects funded through the GIF should better reflect the necessary innovation needed at all levels, including currently unaddressed areas such as advanced modeling and simulation tools at the transmission and distribution levels, which are critical to achieving higher-performance control.

Topic 6: Eligible Project Categories (slide 22 of presentation)

Thinking about where innovation in the sector is headed, are there project categories you feel should be added or removed to ensure we're able to fund new innovations in the future?

Considering that the electricity sector is evolving rapidly, it would be useful to integrate project categories that reflect ideas in the areas of digitalization, decentralization, climate change, as well as projects that look at multi-sector coupling. For instance, it would be useful to include:

- **Extreme weather events**: remedial actions, pre-emptive control
- **Data and AI**: predictive analytics, digital twins
- **Smart buildings**: flexibility in electric heating, utilization of smart building controls as non-wires alternatives to improving frequency and voltage regulation
- **Transportation electrification and e-mobility**: EV flexibility, peak power minimization and interactions with mobility hubs
- **Community equity**: affordability-focused solutions (e.g., optimized energy management of low-income households)

Topic 7: Budget (slide 23 of presentation)

How is the funding amount limiting our ability to meet our broader objectives?

Regarding the limit on the maximum IESO support, it may negatively affect the deployment of high-cost innovations and the overall impact of the projects.

What types/scale of projects is GIF unable to support?

For instance, this amount may not be able to cover the expenses of partnerships that involve multiple entities (e.g., multiple academic groups within one institution or collaborations of groups in different institutions). It can also be insufficient to cover projects that involve large, utility-scale demonstrations and digital grid solutions that require investments in equipment as well.

What types of projects could a larger budget enable GIF to support and how could that allow projects to secure additional funding from other sources?

A larger GIF budget can lead to achieving findings that will serve as proof of concept and evidence of success for upcoming funding opportunities for researchers. It is worth noting that GIF results can be used for several NSERC funding applications, as those include a "Recent Progress" section that illustrates a researcher's successfully implemented ideas and potential for future work. Moreover, through GIF, researchers will have opportunities to foster interactions and future collaborations with other organizations (e.g., local industry or academic institutions), which are essential for bringing in diverse expertise and strengthening future applications. For instance, there are several collaborative programs, such as NSERC Alliance Advantage or Mitacs programs, where continuing collaborative efforts with IESO based on results from GIF can be encouraged.

Topic 8: Intake Approach (slide 24 of presentation)

Do you think the current approach is best to identify and assess projects?

What do you perceive to be the benefits of open calls? Targeted calls?

Open calls can promote inclusivity in the applicant pool, including early career researchers, as well as broader innovation.

Are there alternative approaches that could be considered?

Organizing brainstorming sessions or networking events to promote "matchmaking" between researchers and IESO's interests. The Power Systems Engineering Research Center (PSERC), as an example, has an industrial advisory board that meets twice annually to identify key industry research needs that are then discussed with academic researchers and developed into funded research proposals.

General Comments/Feedback