

Grid Innovation Fund 2024 – Background

Overview

Demand for electricity in Ontario is forecasted to increase 60% over the next 20 years. The electrification of the transportation and heating sectors are major contributors to rising demand, changing daily electricity use patterns and the way we manage the system.

As the energy transformation continues in Ontario, many processes traditionally powered by fossil fuels are switching to electricity, with electric vehicles and heat pumps becoming increasingly common. This switch is driven by a number of factors, including: customer choice, government policy, emissions reduction goals and the mainstream commercialization of cost-effective technologies.

While electrification will add more demand on the system, there is an opportunity for the IESO and local distributors to leverage these technologies to contribute to grid flexibility, reliability, affordability and sustainability.

Grid Innovation Fund 2024 Call for Proposals

The Grid Innovation Fund (GIF) is releasing a call for proposals in 2024 with a maximum budget of \$9.5 million. This year's projects will demonstrate the IESO's efforts to advance electrification and demand management, emphasizing that controllable loads can contribute to electricity system reliability and affordability. Some primary learning objectives include:

- Informing new ways to leverage electric vehicle and heat pump aggregations to provide grid services at the local and provincial levels.
- Informing programs or incentives that could be incorporated into the IESO's future conservation and demand management framework
- Helping local distribution companies gain experience with demand management solutions as non-wires alternatives while supporting better energy management among consumers.

In collaboration with the IESO, the Ontario Energy Board will serve as a regulatory partner, where proponents can concurrently seek guidance from its Innovation Sandbox.

This year's call for proposals includes two streams.

Stream One: Electric Vehicles

EV adoption in Ontario is increasing, resulting in rising electricity demand. EV charging can overlap with daily system peaks or result in secondary evening peaks. This presents an opportunity to explore the capabilities of aggregations/fleets of EVs and develop a better understanding of how they can be leveraged to support the grid. This stream has two sub-categories:

- **Vehicle to Grid:** Demonstrate how EV fleets or aggregations can be leveraged to support the local and provincial grid by injecting electricity back into the grid when called upon.
- **Managed Charging and Vehicle to Home/Building:** Demonstrate how EV aggregations can be managed to mitigate the impact of charging on the local and provincial grids. LDCs must either lead, or be a partner in, proposals for this category. These projects may also explore use-cases for vehicle-to-home and vehicle-to-building to support the grid or as temporary backup power during outages to support customer resilience and enhance distribution-level reliability.

Stream 2: Space and Water Heating and Cooling

Electrification of heating has begun to accelerate due to the availability of cold climate heat pumps, hybrid heating systems and thermal storage technology. Although the electrification of heating can be highly efficient through heat pumps, it can result in a net increase in electricity demand.

This stream will demonstrate how innovative control solutions help manage the demand of space and water heating and cooling and lower greenhouse gas (GHG) emissions. This stream has three sub-categories:

- **Small to medium-scale heating and thermal storage:** Demonstrate innovative management and control solutions that integrate heat pumps and thermal storage, or manage existing space/water heating systems to better manage their demand and reduce GHG emissions.
- **Large-scale heating and thermal storage:** Implement novel large-scale heat pump systems with thermal storage, to support space or process heating needs of large customers.
- **Aggregation of Heating, Ventilation and Air Conditioning loads:** Explore new automated approaches to aggregate and manage non-residential HVAC controllable loads to support the distribution network and bulk electricity system.

The objective of this stream is to better understand how best to optimize space and water heating electrification through controls, hybridization and thermal storage. A secondary objective is to explore new approaches for aggregations of non-residential HVAC to support the grid.

About the 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 the reliable operation of the provincial grid. Since 2005, the GIF has funded over 260 innovative projects.