



Grid Innovation Fund 2024

Electrification and Demand Management
Draft Proposal Guideline

Table of Contents

1. Overview	3
2. Purpose and Objectives	4
3. Project Streams	5
3.1 Stream 1: Electric Vehicles	5
Stream 1A - Vehicle to Grid (V2G)	5
Stream 1B - Managed Charging (V1G) and Vehicle to Home/Building (V2H/V2B)	6
3.2 Stream 2: Space and Water Heating and Cooling	6
Stream 2A - Small to medium-scale heating and thermal storage	6
Stream 2B - Large-scale heating with thermal storage	6
Stream 2C - Aggregation of Heating, Ventilation and Air Conditioning (HVAC) loads	7
4. Eligibility Requirements	7
4.1 Project Type	7
4.2 Project Category	7
4.3 Project Applicant and Partners	8
4.4 Project Funding	8
4.5 Documentation	9
4.6 Technology Readiness Levels	10
5. Key Performance Indicators	10
5.1 Key Performance Indicators (KPIs)	10
5.2 Standardized Testing	12
6. Proposal Submission, Evaluation, Approval	13
6.1 Proposal Submission	13
6.2 Evaluation Criteria	13
6.3 Evaluation and Approval Process	15
6.4 Funding Disbursement	16
7. Regulatory Partner	16

7.1 Ontario Energy Board (OEB)	16
8. Grid Innovation Fund Supporting Organizations	17
8.1 Electrical Safety Authority (ESA)	17
8.2 Ontario Vehicle Innovation Network (OVIN)	18
Appendices	20
Appendix A: Research Areas of Interest	20
Appendix B: Eligible and Ineligible Expenses	21
Appendix C: Project Documents	22
Appendix D: Bulk Electricity System Standardized Testing - Overview	22

1. Overview

As the energy transition occurs in Ontario, many end-uses traditionally powered by fossil fuels are switching to electricity as a means to decarbonize. This switch is driven by decarbonization goals, choices made by the end-use consumer, government policy, and broader accessibility of cost-effective technologies.

As a result of the energy transition, the electricity system is seeing an increase in demand and changes to electricity usage patterns. According to the IESO's 2024 [Annual Planning Outlook](#), transportation and space heating electrification are major contributors to rising demand in the province, changing daily load profiles, and seasonal peak shifting.

With these changes comes an opportunity to explore how the electrification of these sectors can help support the grid. This is complemented by the opportunity to develop and strengthen cross-sector collaboration with participants that are new to the electricity space, for example, electric vehicle (EV) fleet owners and operators, vehicle manufacturers, customers owning heat pumps and personal EVs, and others.

To advance these opportunities, the IESO's Grid Innovation Fund (GIF) is issuing a targeted call (the Call) for innovative projects focused on Electrification and Demand Management.

The 2024 Call seeks project proposals that demonstrate how electrification can be achieved in a way that helps address Ontario's growing electricity demand in the transportation and space and water heating and cooling sectors while maintaining grid reliability, sustainability and affordability for ratepayers. More specifically, the Call is seeking project proposals under two streams:

1. Electric Vehicles (EVs) - including light, medium, heavy duty vehicles and rail transit
2. Space and water heating - across all sectors

Learnings from successful projects are intended to: (1) support customers in managing electricity costs and reducing greenhouse gas (GHG) emissions; (2) support Ontario distribution utility evolution including coordination between distribution and transmission level operations; (3) inform the IESO's work on demand side management, planning, and innovation and; (4) inform the broader electricity sector on the capabilities of innovative demand-side solutions.

The Ontario Energy Board (OEB) plays an important role as the Regulatory Partner for this Call. The OEB's Innovation Sandbox can provide project-specific support for innovative projects that require customized guidance related to a regulatory requirement and/or assistance in requesting temporary relief from a regulatory requirement. Please see Section 7 for further details.

The IESO will accept for consideration applications submitted between May 27, 2024, and July 21, 2024. Up to \$9.5M in total funding is available for approved projects.

About the IESO's Grid Innovation Fund

The GIF was established by the IESO in 2005 to advance electricity sector innovation in Ontario 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 province's grid. The GIF supports projects that validate the performance and business case of promising new technologies, practices, and services. The GIF supports projects that identify and mitigate market barriers, or otherwise accelerate the adoption of competitive cost-effective energy solutions.

2. Purpose and Objectives

The purpose of the 2024 Call is to demonstrate how innovative demand-side solutions can help address Ontario's growing electricity needs while maintaining grid reliability, sustainability and customer affordability.

Specifically, the 2024 Call is seeking projects that will demonstrate how EVs and controllable space/water heating and cooling equipment can provide system flexibility and be integrated to support the electricity system. System flexibility includes adjusting or shifting electricity consumption and/or injecting energy into the distribution network in response to distribution and/or bulk system needs. Please see Section 4.2 for further details.

High-level objectives include:

1. Demonstrate the *types of flexibility services* that aggregations of EVs and/or weather-sensitive controllable loads can provide to the distribution network and bulk electricity system, including quantifying the amount of flexibility provided, and *quantifying infrastructure deferral value*.
2. Develop and demonstrate novel *programmatic approaches / participation models* that leverage aggregations of EVs and/or weather-sensitive controllable loads to provide grid flexibility services at the distribution and bulk levels, with a focus on areas such as unique program design, automation, visibility of aggregations¹, performance validation, compensation methods and settlement.
3. Obtain *Ontario-specific end-use load profiles and data* to support distribution and bulk system planning activities.
4. Explore how innovative solutions can *support sector evolution* through informing regulatory and policy discussions and initiatives.
5. Quantify the *greenhouse gas emissions reductions* that can result from the electrification of specific end-uses and the management of controllable electric loads.

Key performance indicators (KPIs) outlined in Section 5 have been developed to measure the ability of successful projects to meet the above objectives, and to measure the overall success of the Call.

¹ Visibility of aggregations refers to aggregated Distributed Energy Resource telemetry and deliverability data provided by the aggregator or distribution utility in real-time or close-to-real-time, at a single point of connection to the IESO-controlled grid, for the purposes of providing visibility into the electricity injection / consumption of the aggregated resources.

3. Project Streams

The 2024 Call is seeking projects that fall under the following streams. Applicants are welcome to include more than one stream in their project scope.

Successful projects are expected to provide learnings that may inform several areas of interest, outlined Appendix A.

For clarity, system flexibility can include but is not limited to:

- Peak shaving, load shifting, load shedding and other activities that smooth the load profile over different time frames
- Increasing consumption during times of surplus base load and/or excess generation capacity from renewables
- Providing flexible response duration ranging from intra-hour to multiple days/weeks to enable longer term load shaping activities
- Providing flexible response to minimize sudden changes in consumption, both up and down, caused by high volumes of electrical loads switching on or off at the same time
- Providing load relief to grid infrastructure during times of system need such as extreme weather days, during adequacy shortfalls, etc.
- Providing temporary backup power supply through V2B and V2H for enhanced customer reliability and resilience

3.1 Stream 1: Electric Vehicles

Objective: Demonstrate how EV aggregations and EV fleets can be leveraged to support the distribution network and/or bulk electricity system through participation in an innovative EV program. The EV program should explore how EV aggregations/fleets can provide flexibility services through managed charging (V1G), vehicle-to-home (V2H) or vehicle-to-building (V2B), as well as grid injection through vehicle-to-grid (V2G). EV types may include light-duty, medium-duty, heavy-duty, and rail transit.

Local distribution companies (LDCs) must either lead or be a partner in proposals for Stream 1. Integration with distribution utility tools, systems, and planning processes must be explored.

Stream 1A - Vehicle to Grid (V2G): Develop and implement a program or participation model that demonstrates how EV fleets can provide flexibility services that support the distribution network and the bulk electricity system through direct energy injection from the vehicles back into the distribution grid.

Projects in this stream should aim for a minimum fleet size of: (1) at least 500 kW of total installed charger capacity; (2) at least 500 kW of total vehicle flexible discharge capacity for at least one hour and; (3) at least 5 vehicles.

Stream 1B - Managed Charging (V1G) and Vehicle to Home/Building (V2H/V2B): Develop and implement a program or participation model that demonstrates how managed uni-directional and/or bi-directional charging of behind-the-meter (BTM) EV aggregations can provide flexibility services that support the distribution network and bulk electricity system:

- Demonstrate how to manage charging load to mitigate charging impacts on the distribution network and bulk electricity system (including testing the reduction and increase of electricity consumption)
- Demonstrate how V2H/V2B can offset home or building load to reduce the facility's electricity consumption from the grid
- Demonstrate how V2H/V2B can be used as backup power supply to support customer resilience and enhance distribution-level reliability

Projects in this stream should aim for a minimum aggregation size of: (1) at least 100 kW of average available flexible capacity for at least one hour; (2) at least 50 vehicles for managed uni-directional charging demonstrations (V1G) and; (3) at least 20 vehicles for managed bi-directional charging demonstrations (V2H/V2B).

3.2 Stream 2: Space and Water Heating and Cooling

Objective: Demonstrate how innovative control solutions and technologies can automate, manage and control aggregations of space and water heating and cooling equipment to reduce electricity demand and lower GHG emissions for various customer types in Ontario.

Stream 2A - Small to medium-scale² heating and thermal storage: Demonstrate the capability of control solutions to manage space and/or domestic water heating needs while providing system flexibility in the winter season for the following applications: (1) aggregations of heat pumps integrated with thermal storage in new installation applications; and/or (2) retrofit control solutions for existing heating systems. For clarity, this category excludes residential demand response programs using smart thermostats.

Projects in this stream must deliver a minimum effective/average available load reduction of 100kW for a duration of at least 60 minutes.

Heat pump technologies may include full electric air-to-air, air-to-water or ground source. Thermal storage solutions may include but are not limited to the use of water, bricks or ground-based heat sinks. Domestic hot water technologies include electric resistance or fossil fuel water heater tanks.

Stream 2B - Large-scale³ heating with thermal storage: Design and install a large-scale heat pump system integrated with thermal storage to provide the space and/or process heating needs of a large customer and demonstrate how the system can provide system flexibility for the distribution network and bulk electricity system on an enduring basis.

Projects in this stream must deliver a minimum effective/average available load reduction of 200kW for a duration of at least 60 minutes.

² Applicable sectors: residential, multi-unit residential, and small commercial buildings

³ Applicable sectors: industrial, large commercial, institutional

Stream 2C - Aggregation of Heating, Ventilation and Air Conditioning (HVAC) loads:

Design and implement a new program to aggregate and manage non-residential controllable HVAC loads to support the distribution network and bulk electricity system, with a focus on automation and the ability to provide real-time or near real-time visibility. All participating load facilities must be able to automatically receive and respond to activation signals, and be able to demonstrate intra-hour flexibility (see Section 4.2). Proposed programs must be novel and differ significantly from existing or past IESO or LDC programs/participation mechanisms. It is encouraged to include aggregators as project partners or leads in proposals for this category.

Note: All loads participating in Stream 2C pilot projects are not eligible to participate in current or future IESO-led programs or markets for the duration of the GIF pilot project.

4. Eligibility Requirements

To be eligible for Grid Innovation Fund funding, projects must be located in the province of Ontario and meet all of the eligibility requirements outlined in the sections below.

Each proposal will be screened for eligibility and those meeting all the eligibility requirements will be further evaluated according to the Evaluation Criteria set out in Section 6.2.

4.1 Project Type

This call is tailored to projects that fall within the GIF's Strategic Opportunity stream, and includes the following project types (projects spanning multiple types are highly encouraged):

- **Program:** Testing of a new program/participation model or specific design element that enables consumers to provide flexibility benefits to the distribution network and bulk electricity system. The project must test the program in a real-world environment and should involve suitable partners with appropriate expertise. To determine cost-effectiveness, projects must have an evaluation, measurement and verification component.
- **Emerging Technology Demonstration:** The project must test a near-commercial technology in a real-world environment. Projects must have a measurement and verification component to determine cost effectiveness, electricity savings potential and greenhouse gas reductions. Projects must have a minimum technology readiness level of 7 – prototype ready for demonstration in an appropriate operational environment.
- **Tool:** Development and testing of a new energy management tool, system or approach demonstrating system flexibility for the distribution network and bulk electricity system (e.g., real-time or near-real time visibility of aggregated resources, dispatching systems, telemetry services, etc.).

4.2 Project Category

In addition to aligning with the Strategic Opportunity project type(s) above, projects must propose to test activities related to at least one of the following project categories:

System Flexibility⁴: This includes reducing/shifting electricity consumption⁵, increasing electricity consumption and/or injecting into the distribution network in response to distribution and/or bulk system needs, for example:

- Peak shaving, load shifting, load shedding and other activities that smooth the load profile over different time frames
- Increasing consumption during times of surplus base load and/or excess generation capacity from renewables
- Providing flexible response duration ranging from intra-hour to multiple days/weeks to enable longer term load shaping activities
- Providing flexible response to minimize sudden changes in consumption, both up and down, caused by high volumes of electrical loads switching on or off at the same time
- Providing load relief to grid infrastructure during times of system need such as extreme weather days, during times of peak demand, etc.
- Providing temporary backup power supply through V2B and V2H for enhanced customer reliability and resilience

System Integration: System integration refers to the effective and reliable integration of a demand-side resource aggregation and/or injecting EV fleet into distribution utility and IESO planning and operations such that the resource aggregation is able to demonstrate its capability of providing services to the distribution network and the bulk electricity system (e.g. visibility, dispatching, planning activities, resource performance validation, resource compensation, etc.,).

4.3 Project Applicant and Partners

Proposals are welcome from non-profit and for-profit incorporated entities including but not limited to electricity distributors, technology companies, fleet owners/operators, academic institutions, public sector organizations and others.

A minimum of three partners, including the lead applicant, are required to participate in the project and provide cash and/or in-kind contributions.

Funding is not available to individuals, including incorporated individuals, sole proprietorships, trusts, or joint ventures.

4.4 Project Funding

The Grid Innovation Fund has a total budget of \$9.5 million for this call, distributed across selected projects.

⁴ For clarity, this category includes but is not limited to demand reduction, conservation behaviour, load reduction, load displacement, and efficient electrification.

⁵ Reducing/shifting electricity consumption includes leveraging behind-the-meter generation to reduce the amount of electricity drawn from the distribution grid

To qualify for funding, a proposed project must be a large-scale pilot that demonstrates strategically important activities, technologies, services, or approaches that cannot be effectively piloted at a smaller scale and that demonstrate the potential for scalability within the Ontario electricity sector. For this reason, there are minimum requirements for the IESO contribution funding requested.

The following funding requirements must be met:

- Maximum \$4.75M limit of requested funding from the IESO per project
- Minimum \$1M of requested funding from the IESO for Stream 1 projects
- Request for IESO funding must not exceed 50% of total project value
- Applicant and partner cash contributions must comprise 35% or more of total project value
- The lead applicant's cash contribution must comprise 15% or more of total project value
- Project expenses must align with the GIF eligible project expenses outlined in Appendix B

Applicants are required to secure funding additional to that requested from the IESO, including funding from project partners. Each project partner must submit a signed letter of support specifying the contribution amount and the type of contribution (cash and/or in-kind), with the proposal submission package.

In-kind contributions are defined as eligible non-monetary resources that can be provided by the project lead or partners. In-kind contributions are assets and services that are essential to the project and that would have otherwise been purchased by the project proponent and may include capital items that partners donate to the project, professional services and training.

Eligible cash contributions are expenses for the direct costs of activities that are directly related to achieving the objectives and deliverables for which the GIF funding was awarded.

Grant stacking with other non-IESO sources of funding is encouraged, however duplicate funding of IESO-supported tasks is not permitted. Applicants will be required to provide information that substantiates no duplicate funding of IESO-supported tasks.

Projects cannot receive additional funding from other IESO-administered programs such as the Save on Energy programs or participation in IESO-Administered Markets for the duration of the project term, unless approved by the IESO.

Eligible and non-eligible expenses are outlined in Appendix B. All budgeted expenses using IESO funds are subject to audit.

4.5 Documentation

To be eligible for funding, the applicant must provide the following at the time of proposal submission:

- Audited financial statements from the most recent year
- Copy of the applicant's certificate of incorporation
- Signed letters of support from all project partners, confirming partner contribution amounts

- Substantiation of no duplicate funding for IESO-supported tasks (if grant stacking with other non-IESO grant sources of funding)

Please refer to Appendix C for a full list of documentation requirements.

4.6 Technology Readiness Levels

Demonstration projects must address technological or market challenges by validating and deploying pre-commercial technologies and/or market concepts. Projects as a whole must target Technology Readiness Levels (TRL) of 7 or higher. For more details on the TRL levels, including examples, please refer to the Government of Canada’s [TRL Assessment Tool](#).

5. Key Performance Indicators

5.1 Key Performance Indicators (KPIs)

The below KPIs will be used throughout the duration of the project and post-project completion to: (1) determine the success of each funded project and; (2) evaluate the overall success of the 2024 GIF call in achieving its high-level objectives.

KPI	KPI Description	KPI Methodology / Input Data
Flexibility Provided	Quantifies the amount of flexibility provided (as defined in Section 4.2 above) to both the distribution network and bulk electricity system, including the number of flexibility services, number of instances, number of hours, total capacity (MW) and total flexibility (MWh).	Inputs include but are not limited to: <ol style="list-style-type: none"> 1. Program guidelines 2. Definition of the flexibility service 3. Activation/dispatch notifications 4. Measurement data 5. Performance Assessments Round-trip-efficiency for storage may be requested

KPI	KPI Description	KPI Methodology / Input Data
Program Effectiveness	<p>Examines how effective project programs are in meeting the objectives of this call, including their ability to (where applicable):</p> <ul style="list-style-type: none"> • Enroll and retain project participants • Manage/optimize the energy consumption of the loads to provide flexibility services to the distribution and transmission grid • Provide real-time telemetry/visibility into individual and aggregated load behavior • Provide data for individual and aggregated loads for performance validation and settlement purposes • Develop and implement T-D coordination protocols 	<p>The IESO will provide stream-specific grading rubrics to calculate this KPI after projects are selected.</p>
Ontario-Specific Load Profiles	<p>Indicates the number of unique end-use load profiles that are statistically significant and can inform planning processes at the distribution and bulk system levels. Load profiles should be categorized by end-use type (e.g. school bus, delivery truck, etc.) and climate/geography.</p>	<p>Projects will be required to provide 8760 hourly demand (kW) data broken down by end-use type and geographic region for the duration of at least one year. Individual load profiles may be requested.</p>
Infrastructure Deferral Savings Potential	<p>Examines the project's ability to meet or contribute to the load relief requirements necessary to defer infrastructure upgrades at the distribution and transmission levels.</p>	<p>Projects will be required to use approaches outlined OEB's Benefit-Cost Analysis Framework and/or transmission deferral methodologies, approved by the IESO.</p>

KPI	KPI Description	KPI Methodology / Input Data
Sector Evolution	Assesses the projects' capacity to gather information and disseminate insights that will facilitate regulatory innovation and/or inform policy.	<p>Methodology</p> <p>High – The project has advanced regulatory innovation through the provision of comprehensive quantitative and qualitative data, analyses and insights. These contributions can inform regulatory and policy initiatives while also delivering public value.</p> <p>Medium – The project has contributed to regulatory innovation by offering quantitative and qualitative data, analyses and insights. These contributions can inform regulatory and policy initiatives.</p> <p>Low - The project has provided insufficient information. These contributions are too limited to adequately inform regulatory and policy initiatives.</p>
Emissions Reductions (tCO2e)	Quantifies the reduction in Scope 1 and 2 emissions throughout the course of the project resulting from the electrification of the end use and management of the electric controllable loads.	Publicly recognized/standardized methodologies for calculating emissions reductions must be used, and marginal emissions reductions published in the IESO's Cost Effectiveness Tool should be used to inform Scope 1 emissions reductions (https://www.ieso.ca/en/Sector-Participants/Energy-Efficiency/Evaluation-Measurement-and-Verification)

5.2 Standardized Testing

The IESO will provide a standardized testing framework to successful proponents that will assist in measuring the bulk electricity system impacts and transmission-distribution coordination in a consistent manner. Refer to Appendix D for a high-level overview of the different types of tests that may be included in the final testing framework.

6. Proposal Submission, Evaluation, Approval

6.1 Proposal Submission

Proposals may be submitted via email to gridinnovationfund@ieso.ca between May 27th, 2024, and July 21st, 2024, with the words "Electrification and Demand Management Targeted Call" in the subject line.

Proposals must include the documents outlined in Appendix C. Proposals **will not be accepted after 11:59 p.m. on July 21st, 2024.**

The IESO will respond by email to applicants to confirm receipt of proposals within two business days.

Proponents must not engage in any unethical conduct, including lobbying or other inappropriate communications, offers of gifts to IESO employees, officers or board members, deceitfulness, submitting Proposals containing misrepresentations or other misleading, fraudulent or inaccurate information, or any other conduct that compromises or may be seen to compromise the integrity of the Proponent or the Call process. The IESO may disqualify a proponent from the Call if that proponent engages in any of the foregoing activities or conduct, or if that proponent's Proposal contains a misrepresentation or any inaccurate, fraudulent misleading or incomplete information (including as it relates to the disclosure of financial or in-kind contributions).

Please note, that by submitting a proposal, you agree that the IESO may also share your submitted or final Proposal with the Ontario Energy Board (OEB) for the purposes of regulatory support (as further described in Section 7).

6.2 Evaluation Criteria

Following the principle of fairness, integrity and transparency, all proposals will be evaluated and ranked using the following evaluation criteria. The IESO reserves the right to conduct interviews (30-60 minutes) with selected proponents to better understand project details.

Category ⁶	Evaluation Criteria Description	Weighting
Project Purpose and Outcomes	The project purpose is clearly described and aligned with the high-level objectives of the 2024 GIF call. The project outcomes have the potential to meaningfully support the distribution and provincial grid and influence sector evolution.	5

⁶ With respect to the Grid Innovation Fund governance, the following Evaluation Criteria Categories have been re-named for the purposes of this call: Grid Flexibility relates to "Strategic Fit", Demand-Side Program Design and Innovation relates to "Potential impact on program design or measures", Sector Evolution relates to "Market capability building impact".

Category ⁶	Evaluation Criteria Description	Weighting
Grid Flexibility	<p>The proposal clearly articulates:</p> <ol style="list-style-type: none"> 1. The type(s) of flexibility service(s) that will be tested (4) 2. The type of need(s) they will be addressing at the distribution and bulk levels (4) 3. How the flexibility will be tested and quantified, including clearly stated metrics and methodologies (4) 4. The distribution and transmission assets (e.g. transformer stations) that will be part of the project (4) 5. The types of unique end-use load profiles that will be provided by the project (2) 6. How the hourly demand data across the participants will be measured, collected, validated and assessed against factors such as weather patterns or extreme weather events (2) 	20
Demand-Side Program Design and Innovation	<p>The proposal clearly describes:</p> <ol style="list-style-type: none"> 1. A well-defined, unique program design or participation model that meets the needs of the consumer while providing flexibility to the grid, including consideration for visibility, performance validation, compensation mechanisms and settlement (10) 2. How outcomes can be used to inform future demand management programs, measures and/or potential market design for LDCs and/or the IESO (5) 3. How the project is "state of the art" in Ontario, including demonstrating novel demand-side programs, services, business arrangements, or technologies (5) 	20
Project Design	<ul style="list-style-type: none"> • The overall project design is realistic and likely to meet the stated objectives within the specified timeframes. The scope, work plan and scheduled tasks are contained in a clear and logical framework that supports the successful completion of the project. (5) • The deliverables and associated activities are reasonable and clearly articulated (5) • The approach to measure KPIs is clearly stated and appropriate. (5) • The proposal includes a clear and realistic Marketing Plan to attract participants such as EV owners (5) 	20

Category ⁶	Evaluation Criteria Description	Weighting
Project Funding	<ul style="list-style-type: none"> The budget items outlined in the Proposal Template Part B are relevant to achieving the objectives of the project and the call (5) Budget line-item dollar amounts are reasonable and clearly linked to activities and deliverables (5) Project risk is appropriately allocated, and the proponent is in good financial standing and able to carry their financial obligations (5) <p>Note: higher points will be allocated to projects with a lower percentage of IESO funding vs. total project value (risk allocation principle)</p>	15
Project Team and Partners	<p>The project team and partners have the qualifications and experience required to execute a large-scale, strategic project. Projects with a greater number of highly qualified, experienced and committed partners will be given greater points due to the capacity-building aspects that such projects offer.</p> <p><i>Note that proposals for Stream 1 are required to be led by or include an LDC partner.</i></p>	5
Emissions Reductions	<ul style="list-style-type: none"> Publicly recognized/standardized methodologies for calculating the GHG emissions reductions are used. The methodology to calculate GHG emissions reductions (Scope 1 GHG emissions resulting from end-use electrification and Scope 2 GHG emissions reductions resulting from load management and other project activities) is clear and demonstrates net annual GHG emissions reductions over the course of the project. 	5
Sector Evolution	<p>The proposal describes:</p> <ol style="list-style-type: none"> How project outcomes can be used to inform regulatory innovation and policy initiatives, including identifying existing regulatory/policy barriers and proposed solution to the barriers (5) How post-project activities that would enable broader uptake of the solution (market advancement) (5) 	10
Total Score		100

6.3 Evaluation and Approval Process

Potential applicants are encouraged to contact the Grid Innovation Fund team at gridinnovationfund@ieso.ca to discuss their project prior to submitting a proposal. Upon request, IESO staff will meet with potential applicants to discuss projects.

Once proposals are submitted, they will be screened for eligibility. Those proposals that meet all eligibility requirements will be further evaluated as follows.

Following the principle of fairness, integrity and transparency, the IESO will form an internal Technical and Financial Review Committee, with the support of external technical experts as needed (the Review Committee) to evaluate and score each eligible proposal. Applicants with highly ranked proposals will be provided with the opportunity to work with the Review Committee to refine their proposals to address any questions and/or feedback.

To ensure that the IESO funds projects under each project stream and to ensure ratepayers benefit from the learnings that can be provided by each project stream, the IESO will take the following approach until the \$9.5M of funding is allocated:

- First select the highest scoring proposal from each of project streams 1 and 2
- If funding is still available, select the highest scoring proposals of all remaining projects until funding is exhausted

The Review Committee will aim to bring high-ranking proposals forward for IESO executive approval in Q3 2024. Applicants will be notified of the outcome in Q4 2024.

Successful applicants will have the opportunity to participate in IESO communication activities, including public announcements of successful Grid Innovation Fund projects.

6.4 Funding Disbursement

Successful applicants will be required to enter into the form of agreement provided in Appendix C, Contribution Agreement Template. Note: **this agreement is non-negotiable**; the IESO will not make changes to the agreement for individual proponents and any applicants responding to this RFP should ensure they are comfortable signing the agreement as it is currently written before submitting a proposal.

Following the principle of a risk-based approach, funding is disbursed on a milestone basis as projects complete key deliverables identified in the proposal. Submitted proposals must set out the number, content, timing, and budget of milestones in their proposal.

In addition to the Milestone Report, progress reports may be requested and required on an annual basis.

7. Regulatory Partner

7.1 Ontario Energy Board (OEB)

The OEB plays an important role as the Regulatory Partner for this Call.

Once successful applicants are selected by the IESO, they will be directed by the IESO to the OEB’s Innovation Sandbox. Applicants are expected to seek and receive (subject to OEB approval) regulatory guidance as a condition of the first Milestone. It is encouraged to engage with the Sandbox as early as possible to determine whether your project may require regulatory support from the Sandbox.

The OEB’s Innovation Sandbox provides two types of support to innovators: an “Information Service” and “Project-specific Support.” The Information Service is intended to be an easy and accessible way for innovators to reach out to OEB staff with questions about the regulatory framework as it relates to innovative ideas, products, services or business models, or ideas about a specific pilot project.

Project-specific support is available for innovators wishing to move forward with a specific innovative project and allows innovators to request specific forms of support from OEB staff, including customized guidance related to a regulatory requirement and/or assistance in requesting temporary relief from a regulatory requirement.

Both of these services are provided to innovators by the Sandbox team which is composed of subject matter experts from across the OEB.

Applicants are encouraged to seek Sandbox guidance for projects aiming to test innovative business models, activities and services such as:

- Arrangements that test new activities, services or business models for project proponents that are not present in the current regulatory environment or not contemplated by the current regulatory framework;
- Identification of regulatory requirements that might prevent or impede the innovative arrangements, activities or business models being proposed

OEB Innovation Sandbox support may include information, customized guidance, and OEB staff assistance in pursuing temporary relief from regulatory requirements.

The OEB may grant exemptions from its own regulatory requirements (such as OEB electricity codes, OEB natural gas rules and OEB license conditions). Subject to certain exceptions set out in legislation, the OEB cannot grant exemptions to requirements in statutes or regulations. Exemption applications are decided by OEB decision-makers and may require a hearing. OEB Innovation Sandbox Staff will work with proponents throughout the process.

For more information about the OEB Innovation Sandbox, please visit www.oeb.ca/innovation.

8. Grid Innovation Fund Supporting Organizations

8.1 Electrical Safety Authority (ESA)

The Electrical Safety Authority (ESA) regulates and promotes electrical safety in Ontario. The Ontario government has given ESA a mandate to improve public electrical safety. The ESA administers Part VIII of the Electricity Act and oversees these five related regulations:

1. Ontario Electrical Safety Code (Regulation 164/99) — sets out how to do electrical work.

2. Licensing of Electrical Contractors and Master Electricians (Regulation 570/05) — sets requirements for businesses and certain people who can do electrical work.
3. Electrical Distribution Safety (Regulation 22/04) — provides objective-based electrical safety oversight and sets out the accountabilities of companies licensed to distribute electricity.
4. Electrical Product Safety (Regulation 438/07) — governs pre-market approval of electrical products before their sale, distribution and advertisement.
5. Administrative Penalties (Regulation 12/23) – sets out what and how ESA can issue administrative penalties for non-compliant action(s).

The Ontario Electrical Safety Code (OESC) has comprehensive requirements related to product approval, applying for inspection, submitting plans for review and connection authorization requirements. Including this program (*), any work (where the OESC applies) on an electrical installation will need to comply with the above requirements, which include what to install, who is eligible to install and how to install. Installers and designers are required to meet and satisfy the current OESC requirements, and are encouraged to refer to the latest bulletins issued by the ESA. The bulletins include interpretations, clarifications, and sometimes easements.

- A sample of these published bulletins and the link to purchase the OESC are located on the following website link: <https://esasafe.com/electrical-products/bulletins/>
- Notifications can be filed on the following website link: <https://esasafe.com/fees-and-forms/forms/>
- Plan Review submissions can be filed on the following website link: <https://esasafe.com/business-and-property-owners/electrical-plan-review/>
- For more information about ESA technical requirements, please refer to the following website link: <https://esasafe.com/code-technical/>

(*)OESC requirements apply to work on an electrical installation related to this program. Work on an electrical installation may include but is not limited to, the installation (e.g. new equipment, future modifications, replacement and retrofitting) of:

- Electric Vehicle Supply Equipment (EVSE), Electric Vehicle Energy Management Systems (EVEMS) and Energy Management Systems (EMS); - examples of related OESC bulletins and sections are Bulletin 2-3-18, 2-11-*, 8-3-*, 86-1-*, Section 86.
- All electric power production sources including bi-directional EVSE (e.g. Vehicle-to-Grid (V2G), Vehicle-to-Building (V2B), Vehicle-to-Home (V2H)) shall meet all the requirements of the OESC including Section 64, 84 and 86.
- Installation of Space Heating and Water Heating equipment (e.g. heat pumps, furnaces, duct heaters, and water heaters); - examples of related OESC bulletins and sections are: 8-3-*, 26-15-*, and 26-24-*, Section 8, 26, 62 and Specification ESA SPEC-007 R9.

8.2 Ontario Vehicle Innovation Network (OVIN)

For smaller-scale EV-related projects that do not meet the \$1M minimum funding request, we encourage proponents to check out the Ontario Vehicle Innovation Network (OVIN) [R&D Partnership Fund – Advanced Charging and Vehicle-to-Grid \(V2G\) Stream](#) to see if your project would be a good fit for that program.

Appendices

Appendix A: Research Areas of Interest

Successful projects are expected to provide learnings that may inform several areas of interest, including but not limited to the below.

Electric Vehicles
Demonstrate aggregated state of charge for injecting EV fleets (including state of charge estimation and availability)
Impacts on the bulk electricity system resulting from EV aggregations
Impacts on distribution system resulting from EV aggregations, including assessing backfeed capability at the residential level
EV aggregation / EV fleet flexibility and response to grid conditions
Enabling EV aggregation for market participation and ancillary services
EV Programs: technical capability, participant compensation mechanisms, program design, program cost-effectiveness, forecasting and visibility, transmission-distribution coordination, technical interconnection requirements, operations and settlement, leveraging EV telematics, communication protocols
Explore different types of compensation models (e.g. paying the asset owners vs. aggregators vs. device providers)
Technical requirements of bi-directional charging as a back up power source (e.g. multi-mode inverters) for enhanced reliability and resilience
Aggregated telemetry from dispatchable injecting EV aggregations (e.g. V2G)
Optimal EV charging schedule/ EV charging incentive program
EV market behaviours, including methods for baselining and behaviour by market segment
Capabilities of EV aggregations for backup power purposes
Revenue metering capabilities at the device/residential level including accuracy, latency, scan rate, data skew, communication protocols, etc.
Space and Water Heating
Space/Water Heating Programs: technical capability and cost of technology, measurement and verification, operating philosophy, program and/or incentive design, system integration, optimization

Electric Vehicles
HVAC Programs: automation, forecasting and near real-time visibility, dispatchability, baselining methodologies, optimal program design, program cost-effectiveness
Assessing grid impact of varying penetration of heat pumps
Reliability needs from electrification of heating
Aggregation of space heating / electrical loads while considering thermal mass characteristics of their site (thermal inertia sensitive loading of space heating)
Performance and characteristics of the electrification of industrial heating

Appendix B: Eligible and Ineligible Expenses

Eligible expenses are those directly related to the design, development, demonstration, installation, implementation, testing, measurement, and performance verification of the project.

The following table includes examples of eligible and ineligible expenses.

Eligible Expenses	Ineligible Expenses
<ul style="list-style-type: none"> • Bi-directional EV supply equipment – up to 100% of the incremental cost compared to an equivalent uni-directional charger • Smart inverters, including multi-mode inverters • Certain customer-related infrastructure upgrade costs needed to accommodate the project e.g. upgrading panels, switchgear, customer transformers, etc • Integration of software solutions • Software licensing fees • Purchase of medium/heavy duty electric vehicle fleets – up to 100% of the incremental cost compared to an equivalent ICE (internal combustion engine) vehicle • Heat pumps integrated with thermal storage for residential / small commercial applications • Costs associated with the monitoring, verification, and evaluation of the project’s impacts, including data collection, processing, analysis, and management • Compensation or incentives paid to project participants based on the participation 	<ul style="list-style-type: none"> • Purchase of personal-use light duty electric vehicles • Uni-directional EV supply equipment • Stand-alone heat pumps (without thermal storage) for residential applications • Smart thermostats • Supplementary generation assets that may support the project (e.g. stationary storage) • Costs related to System Impact Assessment (SIA) or Connection Impact Assessment (CIA) processes • Budget deficits • Activities completed or costs incurred before the funding is approved or after the project is completed • Costs over \$50,000 for any single consultant or contractor that has not been selected through a competitive process • Costs associated with the purchase of real estate • Any overhead costs generated by the lead applicant or third parties, such as operating costs related to general maintenance and repair

Eligible Expenses	Ineligible Expenses
<p>and/or performance of their resource(s) in a program</p> <ul style="list-style-type: none"> • Marketing and communications directly related to project activities, including training and education initiatives • Project-specific materials, equipment, products, and services • Salaries and benefits of employees directly involved in the design, selection, purchase, and installation of the project • Professional, engineering, scientific, technical, management and contracting services 	<ul style="list-style-type: none"> • Hospitality, travel costs, incidental or food expenses • Any costs not directly related to the achievement of the project’s objectives as defined in the contribution agreement between the IESO and the applicant

Appendix C: Project Documents

GIF 2024 Proposal Templates Documents are found on the following links:

- Project Proposal Templates Part A
- Project Proposal Templates Part B
- Project Brief Template
- Contribution Agreement Template

With the proposal submission, the following supporting documents are required:

- Copy of the applicant’s certificate of incorporation
- Signed Letters of Support from all project partners, confirming contribution amounts (\$) and type (cash/in-kind)
- Applicant’s most recent audited Financial Statements
- Project Team’s Curriculum Vitae

Appendix D: Bulk Electricity System Standardized Testing - Overview

In addition to projects demonstrating and testing innovative distribution-level services or program elements, the IESO is seeking to conduct standardized testing for the bulk electricity system. Refer to the tests listed below for some examples.

These examples are intended to provide applicants with an idea of the type of bulk-level testing the IESO is interested in and is not a fulsome list of tests. Additional/alternative tests for space and water heating pilots may be requested.

The IESO will work with successful applicants to determine which types of bulk electricity system standardized tests are appropriate for their individual project.

Test Type	Test Description
Energy/ Operating Reserve	<ol style="list-style-type: none"> 1. Test ability of fleet or aggregation to submit bids or offers aligned with its energy requirements, follow a 5-min energy schedule, and respond to operating reserve activations 2. Analyze bid/offer strategy 3. Analyze compliance with energy schedule 4. Analyze amount of OR offered/delivered relative to overall fleet/aggregation capacity 5. Assess how fleet/aggregation availability changes over day/week/season
Frequency Regulation	<ol style="list-style-type: none"> 1. Test ability of fleet/aggregation to follow a rapidly fluctuating dispatch signal (changing every 4 seconds or less) 2. Analyze basepoints, contribution of charging, charging interruption, and discharging (for bi-directional applications) across the fleet/aggregation
Demand Response	<ol style="list-style-type: none"> 1. Test ability of aggregation to curtail charging and/or displace site load following a Demand Response activation 2. Analyze availability, performance, etc.
Grid-friendly Charging (Stream 1 only)	<ol style="list-style-type: none"> 1. Test ability of fleet/aggregation to meet their transportation needs while avoiding charging/prioritizing discharging or prioritizing charging/avoiding discharging during varying pre-defined periods of the day, aligned with current and forecasted future system demand peaks and troughs 2. Test ability to stagger or smoothen the charging or discharging of the fleet/aggregation to minimize sudden steep fluctuations in load or generation, including minimizing the "secondary peak" effect resulting from scheduled charging aligned with time-of-use rates
Emissions-friendly Charging (Stream 1 only)	<ol style="list-style-type: none"> 1. Test ability of fleet/aggregation to meet their transportation needs while avoiding charging/prioritizing discharging or prioritizing charging/avoiding discharging during varying pre-defined periods of the day, aligned with the level of renewable generation or emissions on the grid
Transmission-Distribution Coordination	<ol style="list-style-type: none"> 1. Test ability of fleet/aggregation to coordinate operations, services, outages, etc. amongst the LDC and IESO

**Independent Electricity
System Operator**

1600-120 Adelaide Street West
Toronto, Ontario M5H 1T1

Phone: 905.403.6900

Toll-free: 1.888.448.7777

E-mail: customer.relations@ieso.ca

ieso.ca

 [@IESO_Tweets](https://twitter.com/IESO_Tweets)

 [linkedin.com/company/IESO](https://www.linkedin.com/company/IESO)