Grid Innovation Fund 2024

Electrification and Demand Management Proposal Guideline

May 2024

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1. Purpose of the Guideline

The purpose of this guideline is to provide prospective applicants of the 2024 Grid Innovation Fund Targeted Call, with an overview of the requirements and application process for the call.

Please review this document in its entirety before submitting a proposal.

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 their projects.

2. 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 2024 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 2024 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

demand-side management, planning, and innovation activities and; (4) inform the broader electricity sector of the capabilities of innovative demand-side solutions.

The Ontario Energy Board (OEB), through its Innovation Sandbox, will be playing an important role as a regulatory partner for the 2024 Call. The Innovation Sandbox will provide project-specific support for innovative projects that require customized guidance related to a regulatory requirement(s) and/or assistance in requesting temporary relief from a regulatory requirement(s). Please see Section 8 of this Proposal Guideline for further details on the OEB's role as regulatory partner.

Please carefully read the information and requirements set out in this Proposal Guideline for the 2024 Call. Proposals for the 2024 Call may be submitted to the IESO for consideration between May 27, 2024, and July 22, 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 and that identify and mitigate market barriers, or otherwise accelerate the adoption of competitive cost-effective energy solutions.

3. 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 5.2 of this Proposal Guideline 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 aggregations[1], 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 6 of this Proposal Guideline have been developed to measure the ability of the selected projects to meet the above objectives, and to measure the overall success of the 2024 Call.

4. Project Streams

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

The selected projects are expected to provide learnings that may inform several areas of interest, as further outlined in Appendix A of this Proposal Guideline.

For clarity, system flexibility may 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

[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.

4.1. 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.

Please note: to be considered for GIF funding, a local distribution company (LDC) must either be the applicant or be listed as a partner in the proposal for Stream 1 projects. 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 (single site/meter) or aggregations (multiple sites/meters) 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 proposed under this stream should aim for a minimum fleet or aggregation size of at least 250 kW of total aggregated installed charger capacity and total aggregated vehicle flexible discharge capacity for at least one hour.

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 proposed under this stream should aim for a minimum aggregation size of at least 100 kW of average available flexible capacity for at least one hour.

4.2. 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-scale[2] 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 and/or heat recovery 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 proposed under this stream needs to 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-scale[3] heating with thermal storage: Design and install a large-scale heat pump and/or heat recovery systems 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 proposed under this stream needs to deliver a minimum effective/average available load reduction of 200kW for a duration of at least 60 minutes.

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. Facilities must be able to automatically receive and respond to activation signals, and be able to demonstrate two or more types of flexibility (see Section 5.2) including providing intra-hour flexibility. 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.

Please note: if a load participates in a Stream 2C project, it is not eligible to participate in current or future IESO-led programs or markets for the term that the project is contracted through the GIF.

5. 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 this Section.

Each proposal will be screened for eligibility in accordance with this Proposal Guideline and those meeting all of the eligibility requirements will be further evaluated according to the Evaluation Criteria set out in Section 7.2 of this Proposal Guideline.

Successful projects funded through the Grid Innovation Fund will be no longer than 36 months.

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[2] Applicable sectors: residential, multi-unit residential, and small commercial buildings
[3] Applicable sectors: industrial, large commercial, institutional

5.1 Project Type

The 2024 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.).

5.2 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 Flexibility[4]: This includes reducing/shifting electricity consumption[5], 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

[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

- 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.,).

5.3 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 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.

5.4 Project Funding

The Grid Innovation Fund has a total budget of $9.5 million for the 2024 Call to be distributed across selected projects.

To be eligible for funding, the 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 project proposal is subject to the following funding requirements:

- Maximum $4.75M limit of requested funding from the IESO per project;
- Minimum $1M of requested funding per project from the IESO for Stream 1 proposals
- Request for IESO contribution funding must not exceed 50% of total project value;
- Applicant and partner cash contributions must comprise 35% or more of the total project value;
- The lead applicant's cash contribution must comprise 10% or more of the total project value; and
- Project expenses must be consistent with the GIF eligible project expenses outlined in Appendix B of this Proposal Guideline.

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. These are assets and services that are essential to the project that would have otherwise been purchased by the applicant, 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-funded tasks and activities is not permitted. Applicants will be required to provide information that substantiates no duplicate funding of IESO-supported tasks.

Please note: unless otherwise approved by the IESO, projects cannot receive additional funding from other IESO-administered programs such as the Save on Energy programs or participate in IESO-Administered Markets for the duration of the contractual term of the project under the GIF.

Eligible and non-eligible expenses are described in further detail in Appendix B of this Proposal Guideline. All budgeted expenses using IESO funds are subject to audit.

5.5 Documentation

To be eligible for funding, please refer to Appendix C of this Proposal Guideline for a full list of the documentation required. In addition to the completed proposal template documents required, the applicant must provide the following supporting documentation 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)

5.6 Technology Readiness Levels

To be eligible for funding, 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.

6. Key Performance Indicators (KPIs)

6.1 Key Performance Indicators

The KPIs set out in this section 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 5.2 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: 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
Program Effectiveness	Examines how effective project programs are in meeting the objectives of this call, including their ability to (where applicable): • 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	The IESO will provide stream-specific grading rubrics to calculate this KPI after projects are selected.

KPI	KPI Description	KPI Methodology / Input Data
Ontario-Specific Load Profiles	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.	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. Device-level metering is preferred. For clarity, a customer specific load profile would take into account customer specific impacts to a measures' operation that changes how and/or when a measure operates, such as: business operating hours or multi-unit residential vs. single detached dwelling, or type of vehicles being charged.
Infrastructure Deferral Savings Potential	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.	Projects will be required to use approaches outlined OEB's Benefit-Cost Analysis Framework and/or transmission deferral methodologies, approved by the IESO.
Sector Evolution	Assesses the projects' capacity to gather information and disseminate insights that will facilitate regulatory innovation and/or inform policy.	Methodology 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. 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. Low - The project has provided insufficient information. These contributions are too limited to adequately inform regulatory and policy initiatives.

KPI	KPI Description	KPI Methodology / Input Data
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))

6.2 Standardized Testing

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

7. Proposal Submission, Evaluation, Approval

7.1 Proposal Submission

Please carefully review this Proposal Guideline, including the eligibility and submission requirements.

Proposals must be submitted via email to gridinnovationfund@ieso.ca between May 27th, 2024, and July 22nd, 2024, with the words "Electrification and Demand Management Targeted Call" in the subject line.

Proposals must include the documentation specified in Appendix C of this Proposal Guideline. Proposals **will not be accepted after 11:59 p.m. on July 22nd, 2024.**

The IESO will respond by email to each applicant to confirm receipt of the submitted proposal within two business days.

Applicants 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 applicant, proposal or the 2024 Call process. The IESO may disqualify an applicant from the 2024 Call if that applicant engages in any of the foregoing activities or conduct, or if that applicant'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) on a non-confidential basis for the purposes of regulatory support (as further described in Section 8).

7.2 Evaluation Criteria

Following the principle of fairness, integrity and transparency, all proposals will be evaluated and ranked using the evaluation criteria set out in this Section 7.2. The IESO reserves the right to conduct interviews (30-60 minutes) with applicants 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
Grid Flexibility	The proposal clearly articulates: 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

[6] With respect to the Grid Innovation Fund governance, the following Evaluation Criteria Categories have been re-named for the purposes of the 2024 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".

Demand-Side Program Design and Innovation	The proposal clearly describes: 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	• 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
Project Funding	• 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 applicant is in good financial standing and able to carry their financial obligations (5) *Note: higher points will be allocated to projects with a lower percentage of IESO funding vs. total project value (risk allocation principle)*	15
Project Team and Partners	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. *Note: proposals for Stream 1 are required to be led by or include an LDC partner.*	5

Emissions Reductions	• Publicly recognized/standardized methodologies for calculating the Green House Gas (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	The proposal describes: 1. 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) 2. How post-project activities that would enable broader uptake of the solution (market advancement) (5)	10
TOTAL SCORE		**100**

7.3 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 their project.

Once proposals are submitted, they will be screened for eligibility. Those proposals that meet all eligibility requirements will be further evaluated as set out in this Section 7.3.

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 using the evaluation criteria set out in Section 7.2 of this Proposal Guideline. 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:

1. Select the highest scoring proposal from each of Project Streams 1 and 2.
2. If funding is still available, select the highest scoring proposals of all remaining projects until funding is exhausted.

The Review Committee will look to bring high-ranking proposals forward for IESO executive approval in Q3 2024, with applicants likely being notified of the outcome in Q4 2024.

Successful applicants will have the opportunity to participate in IESO communication activities, including public announcements of the selected 2024 Grid Innovation Fund projects.

7.4 Funding Disbursement

Successful applicants will be required to enter into the form of agreement (Contribution Agreement Template) specified by the IESO in Appendix C. Note: **this agreement is non-negotiable**; the IESO will not make changes to the agreement for individual applicants 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. Applicants must propose the number, content, timing, and budget of milestones in their proposal.

In addition to the Milestone Report, the IESO may request or require project reports on an annual basis.

8. Regulatory Partner

8.1 Ontario Energy Board (OEB)

The OEB will act as a "regulatory partner" for the 2024 Call.

Once successful applicants are selected by the IESO, they will be directed by the IESO to the OEB's Innovation Sandbox. Applicants will be required to seek and receive (subject to OEB approval) regulatory guidance as a condition of their first project milestone to be eligible for GIF contribution funding. Applicants are encouraged to engage with the Innovation Sandbox as early as possible to determine whether their project may require regulatory support.

The Innovation Sandbox provides two types of support: "Information Service" and "Project-specific Support." Information Service is intended to be an easy and accessible way 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 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 Innovation Sandbox team which is composed of subject matter experts from across the OEB.

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

- Arrangements that test new activities, services or business models 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 successful applicants throughout the process.

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

9. Supporting Organizations

9.1 Electrical Safety Authority (ESA)

The Electrical Safety Authority 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. Any work (where the OESC applies) on an electrical installation, GIF projects included, 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/*

The 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.

9.2 Ontario Vehicle Innovation Network (OVIN)

For EV-related projects that do not meet the $1M minimum funding request requirement set out in Section 5.4 of this Proposal Guideline, we encourage applicants to consider whether the project would be eligible to participate in the Ontario Vehicle Innovation Network (OVIN) R&D Partnership Fund – Advanced Charging and Vehicle-to-Grid (V2G) Stream.

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.
Charging strategies to minimize system emissions for EVs (e.g. emission response signal, emission-sensitive participation model)
Space and Water Heating

Electric Vehicles
Space/Water Heating Programs: technical capability and cost of technology, measurement and verification, operating philosophy, program and/or incentive design, system integration, optimization
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**
• 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	• 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

Eligible Expenses	Ineligible Expenses
impacts, including data collection, processing, analysis, and management • Compensation or incentives paid to project participants based on the participation and/or performance of their resource(s) in a program • 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	• Any overhead costs generated by the lead applicant or third parties, such as operating costs related to general maintenance and repair • 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, and must be completed and submitted as part of the applicant's proposal:

- Project Proposal Templates Part A (link to be added once ready)
- Project Proposal Templates Part B (link to be added once ready)
- Project Brief Template (link to be added once ready)

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 Vitaes (CVs)

Successful applicants will be required to enter into the following agreement:

- Contribution Agreement Template (link to be added once ready)

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 required.

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	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	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 (Stream 1B only)	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	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	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	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
linkedin.com/company/IESO

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