

Renewable Distributed Generation Integration (RDGI) Fund

Public Webinar

March 29, 2018

Outline

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 - RDGI Fund Objective, Scope and Principles
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RDGI Introduction

DERs and RDG Integration

- DERs are electricity producing or storing resources, and controllable loads that are directly connected to the distribution system or that are located behind a customer's meter and indirectly connected to the distribution system
 - Today, DERs are mostly renewable distributed generation (RDG) sources in Ontario. In the future, this will include energy storage, microgrids and electric vehicles.
- As DERs increase in Ontario they present both challenges and opportunities for the IESO, Local Distribution Companies (LDCs), and the Ontario Energy Board (OEB), and the Ministry of Energy with regards to:
 - How they are connected and operated
 - How they affect grid operation, planning and markets
 - How costs and revenues across Ontario's integrated grid should be allocated; and
 - How DERs should be accommodated and their value recognized within policy and regulatory frameworks
- The RDGI Fund will support opportunities for DER operators, LDCs, the IESO, the OEB and the Ontario government to demonstrate and learn how DERs can be better integrated into grid operations, planning, forecasting, and how regulatory frameworks can better recognize their value

LTEP Directive Initiative

October 26, 2017 Directive to IESO respecting the Implementation of the LTEP states:

Encouraging an Innovative Sector

With respect to the Government of Ontario's objectives of modernizing the energy system and removing barriers to innovation, the IESO shall:

2.1 Develop a program to support a select number of innovative renewable distributed generation demonstration projects, strategically located and paired with other distributed energy resources and smart-grid technologies, as well as virtual net-metering demonstration projects. The program shall be administered by IESO, and will inform future grid modernization and net metering policies, support grid interoperability and be aligned with market renewal.

RDGI Fund Objective

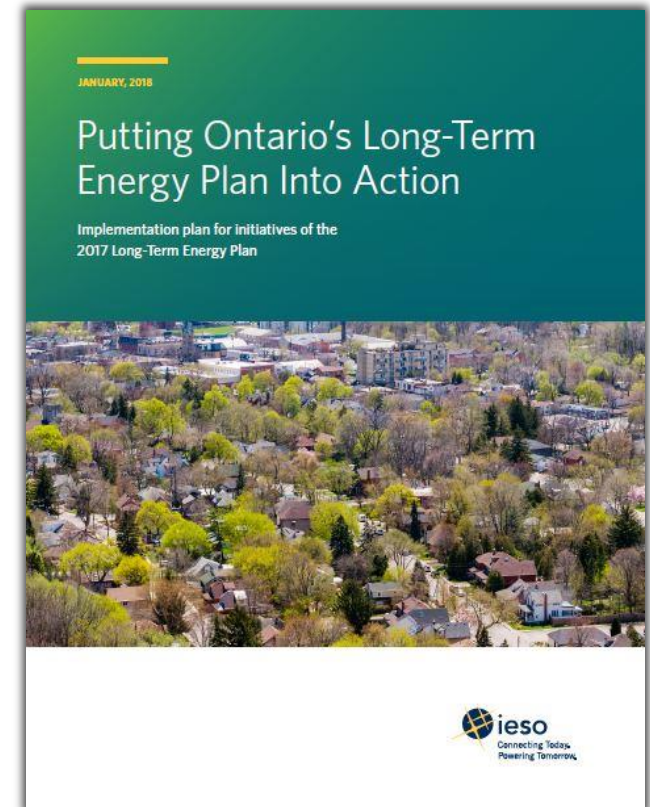
Per IESO's LTPE Implementation Plan, *Putting Ontario's Long-Term Energy Plan Into Action*, as approved by the Minister of Energy on February 8, 2018:

Develop a program to support a select number of innovative renewable DG demonstration projects in order to:

1. gain direct experience with integration of DER;
2. refine methodologies for assessing value;
3. inform the evolution of grid systems, processes; and practices.

The RDGI Fund will also:

- assess impacts and benefits of DER to the electricity system, and help inform development of policy and regulatory frameworks, and;
- explore topics related to non-emitting resources as identified through the Non-Emitting Resources RFI which will inform market renewal



RDGI Fund Scope

Per Ontario's LTEP 2017:

- “...demonstration projects will help inform the value of DG and DER to customers and the grid, and inform future grid modernization and net-metering policies, guide the treatment of renewable DG by regulators and energy markets, and steer further integration of these resources into Ontario's energy system.”

Per LTEP Implementation Plan:

- IESO will seek renewable DG projects, strategically located and paired with other DER and smart-grid technologies, that demonstrate opportunities to enhance integration

RDGI Funding Principles

- RDGI fund will seek to address gaps in knowledge, understanding and/or capability for the integration of DERs into Ontario's electricity system
- RDGI Fund will fund demonstration projects
- Projects must have the potential for replication and to scale beyond demonstration
- RDGI Fund may support technologies/solutions that have not previously been deployed in Ontario however the RDGI Fund will not fund pre-commercial technologies
- Projects must include non-IESO funding/revenue components (non-IESO contribution requirements may vary by investigation topic)
- Demonstration projects with the potential for profitability may be funded, however rates of return should be reasonable and may be capped
- Projects that have potential to address identified distribution, regional or bulk electric system needs may be prioritized
- Projects should demonstrate the value of a technology/solution, and the proposed method for quantifying and evaluating value from the perspective of the LDC, the project proponent, ratepayers and the management of the electricity grid

Investigation Topics

- IESO expects to issue three to five requests for proposals for unique investigation topics over three year period beginning in 2018
- Investigation topics will include well-defined research questions
 - Focused areas of investigation will generally leverage mature underlying technologies to demonstrate DER integration concepts that have the potential to support future deployment
- Virtual Net Metering (VNM) is the first investigation topic
- Future investigation topics to be informed by public feedback and system integration needs

Feedback: Potential Future RDGI Investigation Topics

IESO seeks input on future investigation topics, such as:

- Non-wires alternatives
 - Often used for distribution capacity deferral
- Enhanced DER aggregation models
- Hosting capacity/interconnection processes
- Alternative metering/telemetry
 - Methods for providing visibility data for DER facility to LDC and IESO
- Alternative distribution services
 - Potential services that may be similar to wholesale market products, but may also include new unique distribution level service offerings

VNM Introduction

Definition of Virtual Net Metering

- Virtual net metering is a billing arrangement that allows customers who may not be able to or want to install their own renewable energy systems to participate in a renewable energy project located away from their home or business.
- The electricity conveyed into the grid from the renewable energy project creates bill credits which can be used by one or more participating customers to offset charges on their electricity bills.

Evolution of Net Metering in Ontario

- Ontario's Net Metering Regulation (O. Reg. 541/05)
 - Introduced in 2005
 - Requires electricity distributors to offer net metering to customers crediting energy injection to distribution system at same rates as consumption
 - 500 kW facility size limit
- Net Metering Regulation updated in 2017 (Part 1 Updates)
 - Crediting at same rates as consumption maintained
 - 500 kW size restriction removed and eligibility of energy storage introduced
 - Came into force July 1, 2017
- Additional updates to net metering regulatory framework proposed for 2018 (Part 2 Updates)
 - Ministry consultations in early 2017 on third-party ownership and VNM
 - 2017 LTEP committed to enhancements to Ontario's net metering framework
 - Proposed regulatory measures planned to come into force in 2018

Government Legislative/Regulatory Actions

- Legislative amendments to Ontario Energy Board Act, 1998, were tabled on November 14, 2017 through Bill 177
- Proposed regulatory measures were posted to the environmental and regulatory registries in November 2017, including actions to:
 1. Enable third-party ownership and VNM demonstration projects (proposed amendment of O. Reg. 541/05)
 2. Introduce new and enhanced consumer protections (proposed amendment of O. Reg. 389/10)
 3. Ensure that prescribed types of renewable energy generation facilities are sited appropriately (proposed new regulation to be made under the Electricity Act, 1998)

Proposed Update for VNM Demonstration

On November 28, 2017, the Ministry of Energy proposed changes to O. Reg. 541/05 to facilitate VNM demonstration projects:

- a) Electricity distributors would be permitted to enter into net metering agreements with customers to implement VNM demonstration projects, if the project is participating in a prescribed IESO-administered program and in accordance with criteria set out in that program.
- b) A generation facility utilized for a VNM demonstration project would be required to be a renewable generation facility.
- c) A VNM renewable generation facility would be required to be connected to a distributor's distribution system at a voltage not to exceed 50 kV, and could not be connected to the transmission system.
- d) Subject to the discretion of any involved distributors, customers associated with a VNM demonstration project may be located in a distributor's distribution system other than the distribution system in which the generation facility is located.
- e) Distributors implementing VNM demonstration projects would be required to value credits for any electricity conveyed by the generator into a distribution system based on similar principles (affecting only volumetric charges) as currently specified in the existing net metering regulation.

Draft VNM Research Questions

- What are the different VNM models are potential participants considering (e.g. single entity, multiple entity, etc.) ?
- What resource technologies will be employed, preferred project size, project location
- What are the different ownership structures (e.g. private, co-op, LDC, Municipal) and how might they work?
 - What are the challenges and opportunities associated with each structure?
- What could be the roles of the parties involved in a VNM project?
 - What commercial or other arrangements among LDC, end-customer, and VNM resource provider could be implemented and how might they operate?
- For multi-entity VNM, how might subscribers/end-customers be grouped (e.g. segmentation by customer class, geography, service territory, etc.)?
- How effective will new consumer protection provisions be? Are there existing or proposed industry best practices that exceed minimum requirements? If so, what are those practices?
- What are the primary project activities that will be undertaken and the associated timeframes for them?
- What are the challenges, constraints, barriers, etc. that the IESO should be aware of?

Draft VNM Research Questions

- How will LDC billing mechanisms for VNM function? Will there be significant differences for VNM vs regular net metering?
 - How would these mechanisms change for projects involving more than one LDC?
- Are any LDC costs expected to be rate based?
- How could VNM support regional planning efforts?
- How could LDCs identify specific areas within their service territory that would be better suited for VNM projects?
 - What parameters could be used to make this determination and how could they be measured?
- How should the cost and value of DERs be assessed? (e.g. local value, cost beyond VNM benefits)
- To inform IESO's assessment of proposed local value, is there a common framework/approach for its quantification that participants could use in their RDGI Fund applications?
 - Provide details of such frameworks/approaches and their sources if available

Draft Structure of VNM Call for Proposals

- Renewable energy sources are eligible, consistent with O. Reg. 541/05 Net Metering and proposed VNM regulation
- Bounds on overall call for proposals and projects, potentially including
 - Maximum/minimum capacity/energy
 - Maximum/minimum support sought from RDGI Fund
 - Eligible activities
- Project evaluation criteria, may include
 - Proposed VNM model, business case, and reporting products
 - Local value and proposed methodology for assessing local value
 - Project maturity (shovel readiness)
 - Evidence of LDC support for and willingness to connect and settle VNM project
- Agreement will provide funding support and outline requirements and other terms/conditions
 - Expected that agreements between the generator and customers will provide the primary source of revenue
 - RDGI Fund is considering providing a capital contribution
 - RDGI Fund disbursements will be tied to project milestone achievement
 - Project requirements include expected in-service date and reporting deadlines

Feedback and Next Steps

Key questions for engagement participants

1. What RDGI investigation topics should IESO pursue in the future (slides 10 & 11)?
 - What barriers to DER integration would each topic address?
 - What research questions need to be answered with regards to any suggested investigation topic?
 - What other learnings would the suggested topics provide?
2. Slide 16 outlines the draft research questions for the VNM call. Are there other/different questions that should be asked? If so, what research questions should be investigated for VNM?
3. What are reasonable timelines for potential applicants to the RDGI Fund to develop a project proposal once IESO has announced an investigation topic?

Feedback will be posted on the RDGI Fund engagement webpage unless submitter's specifically identify that feedback is provided on a confidential basis

2018 RDGI Fund Milestones

- RDGI Fund milestones outlined in the IESO's Implementation Plan

Q1 2018	Webinar to introduce RDGI Fund and VNM call
Q2 2018	Draft VNM documents posted
Q3 2018	Final VNM documents posted
Q3-Q4	Proposal submission period
Q4 2018	Successful proposal announced

- More detailed timelines will be posted to the RDGI Fund Engagement (SE) webpage as they become available, including timing of additional investigation topic developments

Next Steps

- Please submit written feedback to engagement@ieso.ca by April 12, 2018
- IESO will post responses to feedback by April 30, 2018
- Draft VNM documents will be posted for comment in Q2
- IESO encourages feedback on investigation topics and research questions posed on slides 10, 16, 17 and 19