

# Grid-Connected Energy System Operational Data Procurement

Information Webinar

March 7, 2023



# Agenda

- Context
- Purpose of Operational Data Procurement
- Invitation to Qualify (ITQ) Process
- Use of Collected Data
- Eligibility and Data Requirements
- Data Sharing Process
- Evaluation Criteria
- Questions, Comments and Communications

# Context

## UNDERSTANDING THE CHARACTERISTICS OF SMART RENEWABLE ENERGY PROJECTS AND THEIR CONTRIBUTIONS TO CANADA'S DECARBONIZATION GOALS

- i. The Government of Canada is committed to reducing greenhouse gas (GHG) emissions to meet Canada's 2030 targets and beyond by supporting the transition towards electrification through smart renewable energy projects and the transformation of the Canadian electricity grid
- ii. There is a need to better understand and interpret smart renewable energy and electrical grid modernization deployment projects performance and decarbonization potential for multiple stakeholders including industry stakeholders, researchers, utilities, community leaders, policymakers, and the public

# Purpose of Operational Data Procurement

## OBJECTIVES OF ENERGY SYSTEM DATA COLLECTION EFFORT

- i. Address questions from stakeholders on **performance** of various energy systems in the Canadian context
- ii. **Identify challenges** related to system design and implementation within national and regional contexts
- iii. Assess **cost-benefits** of technologies through case studies and analysis
- iv. Develop a better understanding and public documentation of the capabilities of **inverter-based resources and flexible loads** in the grid modernization space
- v. Identify potential **technological barriers** related to provision of grid services and flexible loads, including how to support modernization of grid codes and standards
- vi. Identify focus areas/ideas for further **research and development** to drive innovation and scaled-up solutions
- vii. Identify key **infrastructure investment** areas to achieve grid modernization and net-zero objectives
- viii. Estimate regional technology **deployment capacity**
- ix. Establish **advisory committees (internal and external)** on data analytics of energy systems

# Benefits to Qualified Respondents

- Provision of performance data will enable:
  - i. Development of innovative programs and policies based on actual performance data to increase deployment of smart renewable energy systems
  - ii. Collaboration between government, project proponents and utilities to improve the performance of smart renewable energy systems and improve the efficiency of integrating them into electricity grids
  - iii. Advancement of Canada's competitiveness in smart renewables and electrification sectors, supporting new investment opportunities for Canadian-based projects
  - iv. Investigation of market opportunities for provision of grid services
- An advisory committee with data providers will be established
- Monetary compensation will be granted for data provided

# Invitation to Qualify (ITQ)

- A new Invitation to Qualify (ITQ) has been launched to identify qualified suppliers that will be invited to participate in the subsequent Grid-Connected Energy System Operational Data procurement process
- This ITQ is the first phase of a procurement process for the Grid-Connected Energy System Operational Data requirement. Respondents are invited to pre-qualify in accordance with the terms and conditions of this ITQ
- Applications are open until March 27, 2023

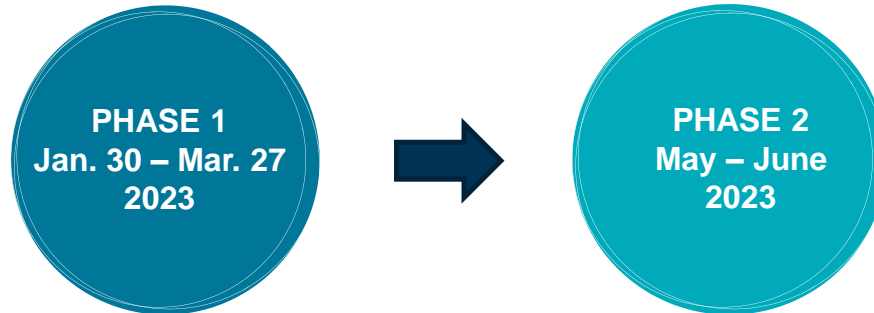
<https://canadabuys.canada.ca/en/tender-opportunities/tender-notice/pw-23-01023917>

# Timelines

## OVERVIEW OF ANTICIPATED PROCUREMENT PROCESS

**Phase 1 - Invitation to Qualify (ITQ) Phase:** This ITQ will be used to qualify Respondents to participate in any subsequent phases of the procurement process. Canada will publish the list of Qualified Suppliers, including all entities, after the ITQ Phase.

**Phase 2 – Request for Standing Offer (RSO) Phase:** Canada will release RSOs to those Qualified Suppliers who remain qualified at the time RSOs are released. Canada does not guarantee that a Standing Offer will be issued as a result of the pre-qualification process. A Standing Offer will only come into effect with the issuance of a valid call up to the Standing Offer. Canada reserves the right to negotiate directly with a pre-qualified supplier should only one Energy System Operator be capable of providing the services.



# How Will Collected Data Be Used?

Data will be used by Government researchers for two main purposes:

## 1. DATA ANALYSIS ACTIVITIES

- Evaluate operational technology or system performance
- Determine which technologies are operating effectively, which require additional research and development, and which could be effective with continued funding support
- Determine the impact and performance of any grid reliability services provided, or the potential for the system to provide grid services and the aggregated benefits if these are scaled up

## 2. MODELING ACTIVITIES

- Develop system dynamic performance simulation models; measured data will support validation exercises, parameterize models and to fill performance data gaps
- Establish expected system performance and system fault operation, and analyze the technical and economic potential for wider deployment and increased efficiency of grid integration
- Perform detailed GHG emission analysis and compare against typical values used in decarbonization models



# How Will Collected Data Be Used?

## Use and dissemination

- Precise use of performance data will depend on the quantity and quality of data received
- Raw performance data will not be released. Any publicly released models will be parameterized using aggregated data, where such data is in sufficient quantity to retain provider anonymity
- General, non-identifiable, benchmark data may be released (e.g., capacity factors within “regions”), subject to data availability

# Technologies under Consideration

## INCLUDES THE FOLLOWING SINGLE OR AGGREGATED ENERGY DEVICE(S)

- Photovoltaic module
- Wind turbine
- Energy storage system
- Hydroelectric dam
- River hydrokinetic generator
- Marine tidal generator
- Geothermal electric generator
- Controllable/flexible electric load
  - Electric vehicle charger
  - Electric water heater
  - Baseboard electric heater thermostat

# Additional Considerations

- Project must be located in Canada
- Project must be connected to an electric distribution grid or a bulk power grid, or have the capability of providing grid services
- Applicant must be the owner of the data or be granted explicit authorization from the owner of the data to disseminate the data
- Minimum capacity
  - Minimum combined electrical generation capacity of 500 kW (exceptions: river hydrokinetic systems must have a minimum combined generation capacity of 50 kW, remote communities must have a minimum combined generation capacity of 25 kW)
  - Combined electrical storage capacity of 250 kW, or combined thermal generation capacity of 5 TJ/year (exception: solar and heat pump systems must have a combined thermal capacity of 1 TJ/year)
  - Minimum grid-controlled demand capacity of 50 kW

# Data Requirements

## PERFORMANCE DATA

- Must include, at minimum, basic metering data, operational settings, and relevant operational conditions such as wind speed or solar irradiance as well as the event logs of each main system component
- Time series data should be at the preferred rate as specified in Mandatory Requirement 6. The minimum accepted time resolution is 1 hour
- Use the data request template provided to identify the data that will be supplied

Company Name		System Identifier		PCC: Point of common coupling Gen: Generator PV: Photovoltaic module Wind: Wind turbine ESS: Energy storage system Load: Controllable/flexible electric load Hydro: Hydroelectric energy River: River hydrokinetic energy Tidal: Marine tidal energy EV: Electric vehicle charger EWH: Electric water heater Baseboard: Baseboard heater thermostat												Source of Data		Sampling period	Access delay	Completeness
Description	Identifier	Unit	PCC	Gen	PV	Wind	Hydro	River	Tidal	ESS	Load	EV	EWH	Baseboard	Data type	Granularity	Source of Data	Sampling period	Access delay	Completeness
Current phase A (or single phase L1)	AphA	A	x	x	x	x	x	x	x	x	x	x	x	x	Time-series	per device	Device Controller	1second	≤ monthly	96% (±2 wk.stgy)

## CONTEXTUAL DATA

- Applicant must provide sufficient contextual data to conduct a basic energy balance (input/output) analysis of the system and must include at minimum the main component specifications, configurations, and settings including a single line diagram of the system

# Point Rated Evaluation Criteria

## MINIMUM REQUIREMENTS AND CRITERIA

- Temporal range of the performance data, from 1 to 7 years (Max score: 10)
  - Can be a combination up to 5 past years and up to 3 years into the future
- Sampling period of each unique data item has a minimum resolution of 1 hour (Max score: 10)
- 20 or more unique performance data parameters. All related contextual data (Max score: 10 | Max 0.5 each)
- Under-represented system location and technology combination. Preference is given to systems that are of strategic interest to Canada (Max score: 30)
- Provide grid services (Max score: 10)

Responses that do not comply with the minimum requirement specified in the evaluation criteria will be declared non-responsive and will be disqualified.

# Data Sharing Process

- NRC will create an account and a dedicated storage space for each data provider.
- NRC will provide guidelines to automate the file transfer from data provider's premise to NRC managed file transfer server.
- Data providers will format the data according to the data provision guidelines and send sample files to NRC for review and format validation.
- Data provider will upload periodically the data files to the NRC managed file server.
- NRC will periodically reconcile the data received with the data providers.

# Data Sharing Process – Time series and settings

## File format:

- Spreadsheet data files generated by data provider: format requirement detailed in the attached “Data Provision Guidelines” document attached to the ITQ

## Example:

	A	B	C	D	E	F	At
1	Timestamp	ABC-corp_ES-001_PV_AphA_A	ABC-corp_ES-001_PV_AphB_A	ABC-corp_ES-001_PV_AphC_A	ABC-corp_ES-001_PV_VphA_V	ABC-corp_ES-001_PV_VphB_V	At
2	2021-08-25T15:34:43Z	123.456	123.456	123.456	123.456	123.456	123.456
3	2021-08-25T15:34:44Z	123.456	123.456	123.456	123.456	123.456	123.456
4	2021-08-25T15:34:45Z	123.456	123.456	123.456	123.456	123.456	123.456
5	2021-08-25T15:34:46Z	123.456	123.456	123.456	123.456	123.456	123.456
6	2021-08-25T15:34:47Z	123.456	123.456	123.456	123.456	123.456	123.456
7	2021-08-25T15:34:48Z	123.456	123.456	123.456	123.456	123.456	123.456
8	2021-08-25T15:34:49Z	123.456	123.456	123.456	123.456	123.456	123.456
9	2021-08-25T15:34:50Z	123.456	123.456	123.456	123.456	123.456	123.456

# Questions, Comments and Communications

## DURING PROCUREMENT PROCESS

- Single Point of Contact
  - [Johnathon.Gillis@nrc-cnrc.gc.ca](mailto:Johnathon.Gillis@nrc-cnrc.gc.ca)
- Deadline for Asking Questions:
  - 3 business days before the ITQ closing date
- Content of Questions
  - Respondents should explain each question in sufficient detail
  - Any questions that a Respondent believes include proprietary information must be clearly marked “proprietary” at each relevant item.
- Publication of Answers
  - All questions and answers will be posted on [CanadaBuys](#) under "Bidding Details"

## ONGOING COMMUNICATION

- Longer term engagement, if of mutual interest
- Advisory committees will be established to guide and inform aspects such as consideration of analytical approaches, research questions, publication support and modeling efforts



# THANK YOU

Cyrille Decès-Petit • [Cyrille.Deces-Petit@nrc-cnrc.gc.ca](mailto:Cyrille.Deces-Petit@nrc-cnrc.gc.ca)

