JULY 30, 2025

Connecting to Ontario's Power System

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Connecting Today. Powering Tomorrow.

Territory Acknowledgement

The IESO acknowledges the land we are delivering today's webinar from is the traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples and is now home to many diverse First Nations, Inuit and Métis peoples. We also acknowledge that Toronto is covered by Treaty 13 with the Mississaugas of the Credit First Nation.

As we have attendees from across Ontario, the IESO would also like to acknowledge all of the traditional territories across the province, which includes those of the Algonquin, Anishnawbe, Cree, Oji-Cree, Huron-Wendat, Haudenosaunee and Métis peoples.

Agenda

Today's presentation will focus on the following key activities performed by the IESO and transmitter to reliably connect a new or modified project to the IESO Controlled-Grid:

1. System Impact Assessment (SIA) – 30 minutes
2. Customer Impact Assessment (CIA) and design and build – 45 minutes
3. Reliable Integration (RI) – 45 minutes

Introduction – Key Industry Players

The Government of Ontario, through the Ministry of Energy and Mines, sets the overall policy for the energy sector mainly through laws and regulations.

Ontario Energy Board (OEB) regulates Ontario's energy sector and sets electricity rates.

The IESO manages the province's power system so that Ontarians receive power when and where they need it. It also plans and prepares for future electricity needs.

Transmitters

- Hydro One Networks Inc.
- Five Nations Energy Inc.
- Canadian Niagara Power Inc.
- Hydro One Networks Sault Ste. Marie LP
- Upper Canada Transmission 2, Inc
- Wataynikaneyap Power LP
- Niagara Reinforcement LP
- Chatham x Lakeshore LP
- PUC (Transmission) LP
- B2M LP

Introduction – Role of the Connection Process

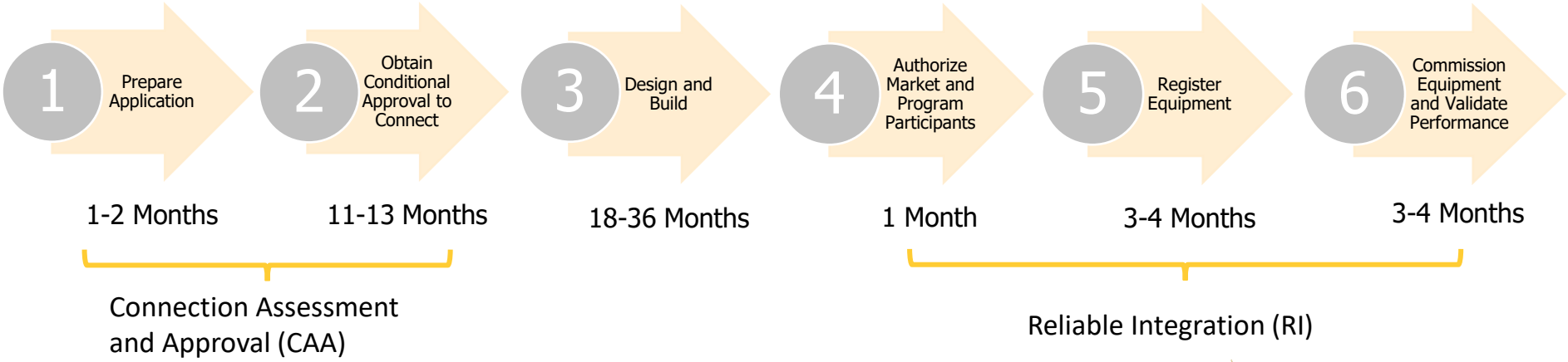
- The electricity system is continuously evolving to support:
  - economic development – datacenters, mines, large residential developments, electrification etc.
  - changes in resource mix – decarbonization of the generation fleet
  - advancement of new technologies – electricity storage, electric vehicles, etc.

- To maintain the reliability and operability of the IESO-Controlled Grid (ICG) and to operate the IESO-Administered Markets (IAM), the IESO, in conjunction with the transmitters, must perform several key activities to integrate these changes.

- This presentation is intended to familiarize potential connection applicants with these activities.

Connecting to Ontario's Power System

The activities to establish a new or modified connection to the Ontario's power system can be grouped in six stages that, based on our past experience, could take anywhere from a few months up to 3-3.5 years.



I. Connection Assessment and Approval – System Impact Assessment

The System Impact Assessment (SIA) Process

Successful completion of the SIA process results in a Notification of Conditional Approval (NoCA) and an SIA report.

According to the Section 6 of Chapter 4 of the Market Rules:

- The SIA report must describe the adverse effects the project will have on the reliability of the integrated power system (findings) and the system upgrades required to mitigate such adverse effects (requirements for connection).

- Connection applicants must meet all requirements for connection described in the SIA report, to the satisfaction of the IESO, before the final approval to energize the project is granted.

When is an SIA required?

New generation facilities or modifications to existing generation facilities

Embedded generation facilities greater than 10 MW

New transmission facilities or modifications to existing transmission facilities

New load facilities or modifications to existing load facilities

Large load addition greater than 10 MW to a distribution system

Ancillary services: regulation, reactive support and voltage control, black start capability

How to determine if a CAA application is needed?

Confirm the Required Connection Assessment Processes

Connection Type	Required processes	Who files the CAA application
New or modified connection of **less than or equal to 10 MW** to a **distribution system** or to an existing load or generation facility within a **distribution system**	Distributor's connection impact assessment process (DxCIA)	No CAA application with the IESO and transmitter is needed for projects in this category. Only an application with the distributor is needed.
New or modified connection **larger than 10 MW** to a **distribution system** or to an existing load or generation facility within a **distribution system**	Distributor's connection impact assessment process (DxCIA) followed by the IESO's and transmitter's CAA process (SIA+CIA).	The distributor must file the CAA application with the IESO and transmitter on your behalf after completing the DxCIA.

Confirm the Required Connection Assessment Processes

Connection Type	Required processes	Who files the CAA application
New connection **within an existing load or generation facility ("host facility")** that is connected to a transmission system	The IESO's and transmitter's CAA process (SIA+CIA)	The owner of the host facility must file the CAA application with the IESO and transmitter on your behalf.
New or modified connection to a **transmission system**	The IESO's and transmitter's CAA process (SIA+CIA)	Your organization must file the CAA application with the IESO and transmitter.

Stage 1: Prepare Application

Pre-Application Meeting (Optional)

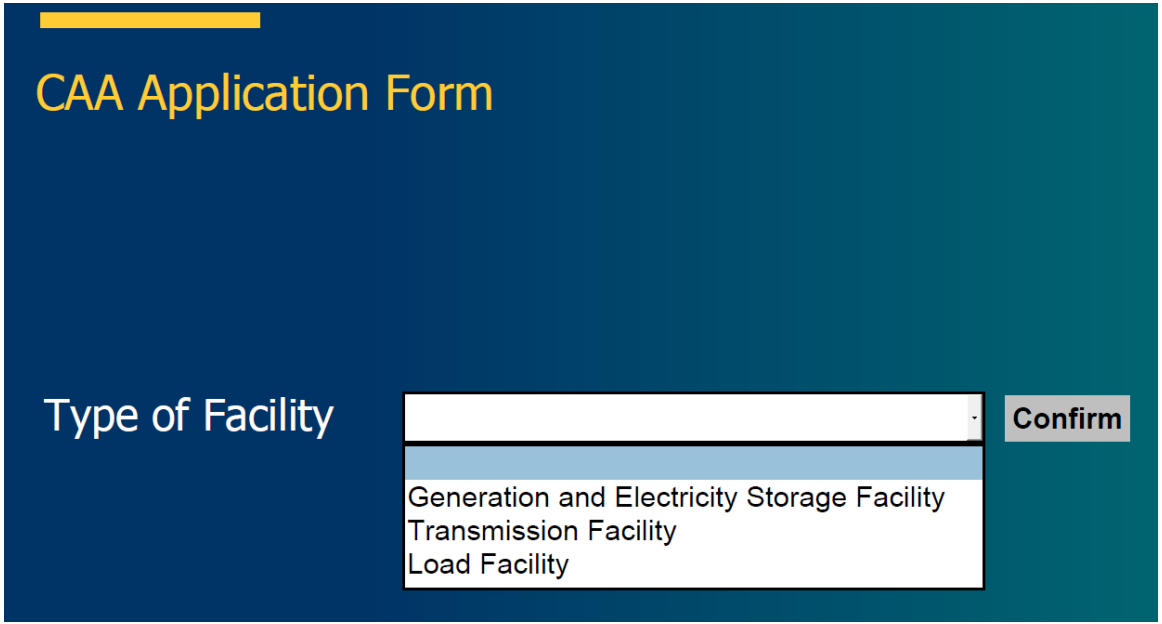
Prospective connection applicants have the option to request a pre-application meeting with the IESO and/or Transmitter, that is generally intended to discuss, at a high level, the following:

- Scope of the project
- CAA process
- Some details of application form
- Timelines and expectations
- Communication plan

How to use the CAA application form

Select the Type of Facility

Sector Participants > Connecting to Ontario's power system > 2 - Obtain Conditional Approval to Connect



Select the Transmitter

PART 1 – General information

Transmitter Selection

Submit this form by email to connection.assessments@ieso.ca and also to the applicable *transmitter* to inform about your new connection or modification to an existing connection.

Select from the list as applicable.

Select Transmitter:

- Hydro One Networks Inc.
- Hydro One Sault Ste. Mar
- Canadian Niagara Power
- Five Nations Energy Inc.
- Upper Canada Transmiss
- Wataynikaneyap Power G
- Other (Fill in Name)

To the extent possible, the (should be submitted in .pdf format. Signed documents should be scann tronically signed by a method accepted by the IESO. Connection applicants ments in a different format are encouraged to contact Connection Assessm

Hard copies of the applicati documents are not required. Where the supporting documentation is not suitable for email submission, contact Connection Assessments via email for instructions.

Provide the Applicant's Information

Applicant Information

Table | Applicant Information

Applicant Information	Applicant Response
Connection Applicant's Organization Name	

Table | Authorized Representative[3]

Authorized Representative	Applicant Response
Name	
Position / Title	
Company	
Address	
City/Town	
Province/State	

Table | Project Contact[5]

Project Contact	Applicant Response
Name	
Position / Title	
Company	
Address	
City/Town	
Province/State	

Certify the Application

PART 4 - Certification

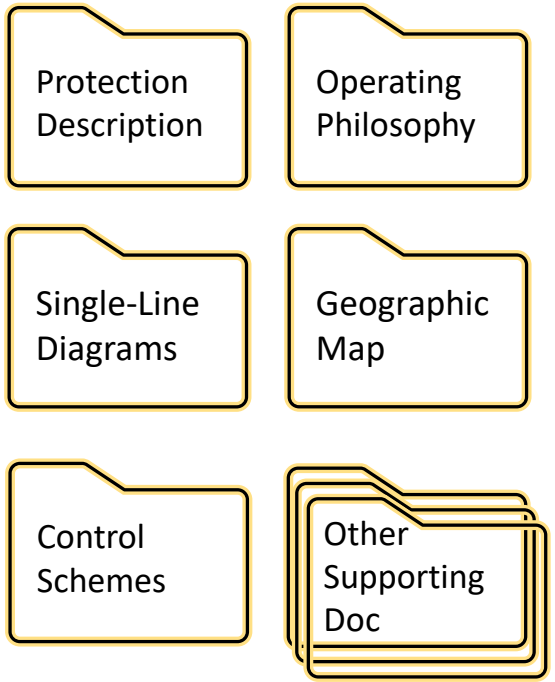
The undersigned hereby declares that the information contained in and submitted in support of this document is, to the best of the connection applicant's knowledge, complete and accurate. By signature, the connection applicant agrees that information may be provided to the affected transmitter(s) and posted on the IESO website as stipulated in the applicable Market Manual pertaining to connection assessment and approval.

Table | Certification

Certification	Applicant Response
Name of Authorized Representative	
Title	
Date	
Signature	

Provide Project Information

- Project description with in-service date
- Point of connection to the transmission system
- Technical data, that includes the characteristics of the equipment proposed for installation at the project
- Prepare supporting documents



Provide Technical Data for Equipment

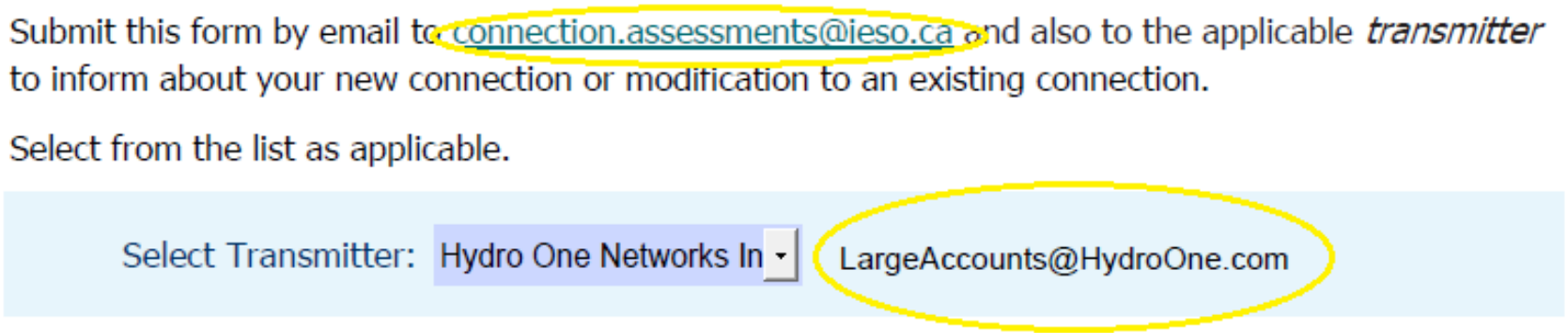
- ☐ Overhead Circuit Section
- ☐ Underground Circuit Section
- ☐ Main Buses
- ☐ Surge Arresters
- ☐ Transformers
- ☐ Shunt Capacitors
- ☐ Shunt Reactors
- ☐ Circuit Breakers
- ☐ Circuit Switchers[12]
- ☐ Disconnect Switch/Mid Span Openers
- ☐ Wavetraps
- ☐ DC Lines
- ☐ FACTS Devices[13]

Dynamic Models

- Generator, Exciter, Power System Stabilizer, Governor, Compensator, Data center
- Inverter-Based Generators and Loads require Electromagnetic Transient (EMT) models
- The models provided should be configured with suitable parameters
- All models will be verified against commissioning test results during the Validate Performance stage
- Acceptable dynamic models are listed in Market Manual 1.6 – Performance Validation

Submit the Application Package

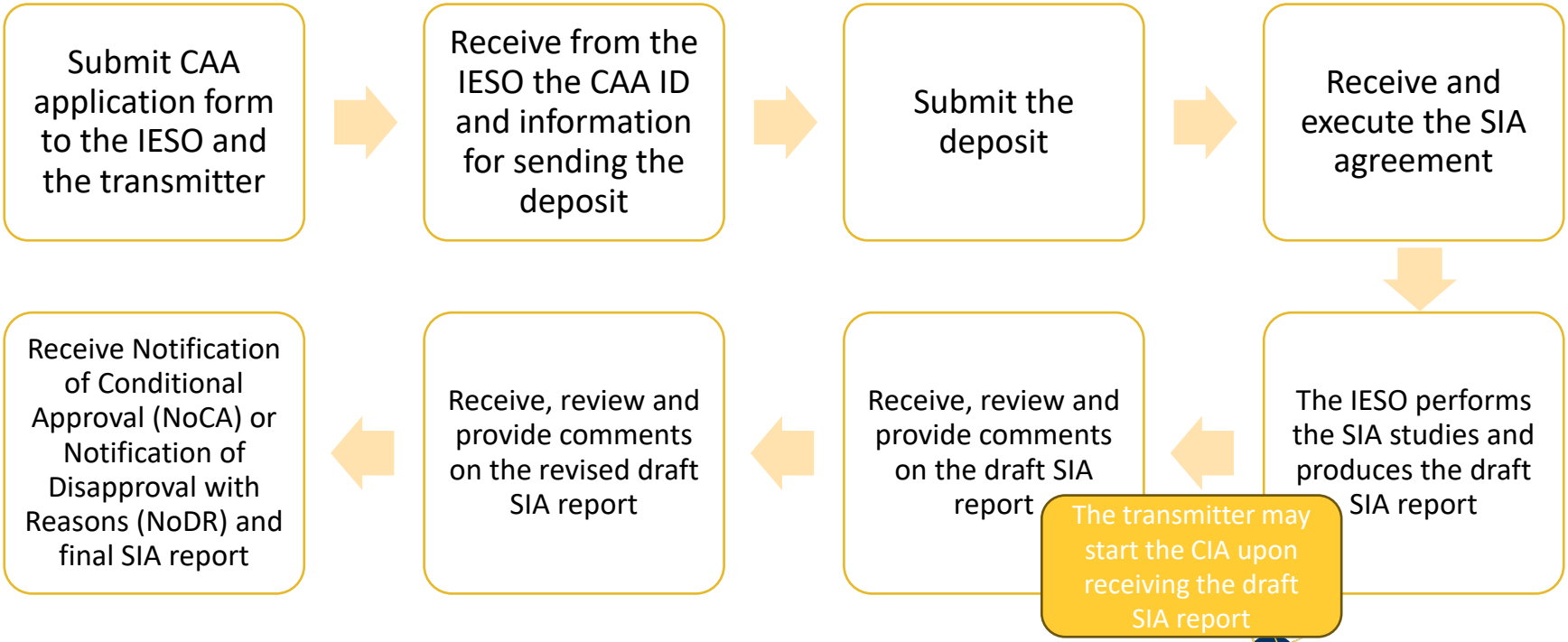
Send the complete and signed application form and supporting documentation ("application package") via email to the IESO and transmitter at the addresses* listed under Part 1 of the form:



* Once the transmitter is selected, the preferred email address of the transmitter will appear on the right side of the transmitter's name.

Stage 2-1: Obtain Conditional Approval to Connect – System Impact Assessment (SIA)

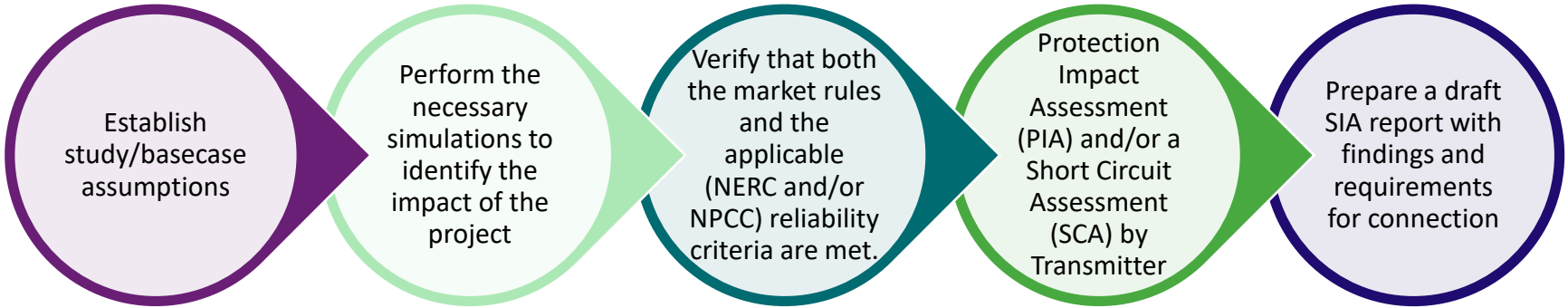
Stage 2-1: Obtain Conditional Approval to Connect: SIA



Conditions to Start SIA Studies

- The complete project data is received
- The deposit is received
- The SIA agreement is executed

IESO's activities during the SIA



Requirements for connection

Must be fulfilled to the satisfaction of the IESO before the project is allowed to connect:

Additional equipment, including metering equipment, that needs to be installed at the project

- Examples: Reactive compensation devices, Remedial Action Scheme (RAS) equipment, circuit breakers, etc.

Additional equipment or modifications to the existing equipment in the transmitter's facilities

- Examples: New diameters in existing stations, in-line breakers on transmission circuits, re-termination of circuits, etc.

Performance requirements for the connection applicant's and/or transmitter's equipment

- Examples: Circuit breakers rated at higher voltage or short circuit levels, or with shorter interrupting times, etc.

Actions to be taken by the connection applicant and/or transmitter

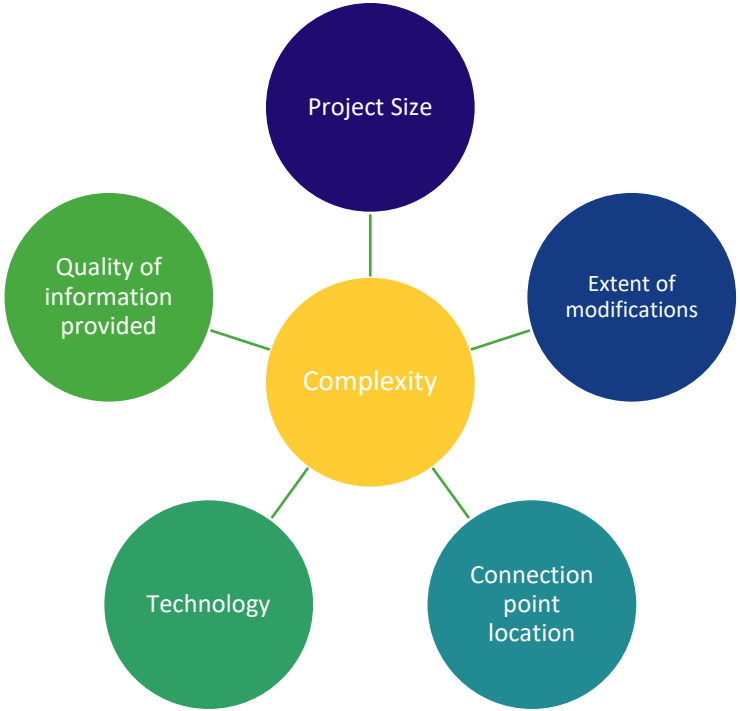
- Examples: Maintain the power factor in a prescribed range, limit maximum load levels or disconnect load at the request of the IESO, etc.

Restrictions on the operation of the connection applicant's operation of the project

- Examples: limit the ramp rate, limit the amplitude and/or frequency of load or generation fluctuations, etc.

Factors that Influence SIA Timelines

- The duration of the SIA depends on
  - the complexity of the work that needs to be done to assess the impact of the project on the reliability of the IESO controlled grid.
  - the responsiveness of the connection applicant.
  - the accuracy and completeness of the information provided to the IESO and transmitter.



Reach Out and Connect with Us

- The IESO is committed to working closely with connection applicants to connect new facilities or modify existing facilities in a timely manner, while maintaining the reliability of the IESO-controlled grid.
- If your organization is looking to connect a new facility to the transmission system in Ontario, reaching out early to the IESO will help ensure a more efficient connection process.
- A pre-application meeting with the IESO and the transmitter is strongly recommended to discuss the project and understand the key steps of the process and the connection applicant's needs.

- Email address: connection.assessments@ieso.ca

II. Connection Assessment and Approval – Customer Impact Assessment

Hydro One Overview

- Hydro One Limited, through its wholly-owned subsidiaries, is **Ontario's largest** electricity transmission and distribution provider, with approximately 1.5 million combined transmission and distribution valued customers.
- Our team of skilled and dedicated employees proudly build and maintain a **safe and reliable** electricity system which is essential to supporting strong and successful communities.
- **We are committed** to the communities where we live and work through community investment, sustainability, and partnership initiatives.
- Hydro One Limited's common shares are listed on the **TSX**, and certain of Hydro One Inc.'s medium term notes are listed on the NYSE.
- For more corporate details and how we are energizing life in Ontario for over 110 years, please visit https://www.hydroone.com/about/

Purpose

Energize life with reliable and sustainable solutions for a brighter future

Vision

A better and brighter future for all

Strategic Priorities

Customers

Strengthen trust and improve customer satisfaction with exceptional service.

Growth

Expand and Modernize the grid to meet Ontario’s energy needs.

Solutions

Drive innovation and leverage technology to support an electrified future.

Partnerships

Build meaningful partnerships to develop high-impact solutions

Hydro One's Role in the Ontario Electrical System

Hydro One's regulated business operates under a 5-year rate regulated Custom Incentive Rate Making Framework. Business energizes life for people and communities, helping Ontarians live a better and brighter future

Generation

Where electricity comes from

Transmission

Electricity travels across Ontario

Distribution

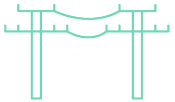
Electricity is delivered to homes and businesses

Customers

End-users of electricity

640,000 km^2
Service territory

30,000
circuit km
of high-voltage transmission lines



126,000
circuit km
of local distribution lines

1.5 million
residential and business customers across Ontario

Hydro One's Transmission Connection Process

Hydro One has a seven-phase process for Transmission (Tx) connections to our grid. An average connection can take anywhere from under two years to over three years to complete. Various factors, such as project complexity, land issues, and approval processes, can extend project timelines.

The study outlines Hydro one scope of work, general technical requirements, budgetary costs and connection options.

IESO feasibility studies are more focused on bulk system considerations.

**Assessment fee required.*
**Feasibility Study Agreement*

System Impact Assessment ("SIA") Application submitted to the IESO

Customer Impact Assessment ("CIA") Application submitted to Hydro One.

These are joint applications

IESO Connection Assessment & Approval (CAA) can take between 8+ months, and Hydro One CIA can take between 4-6 months.

Draft studies issued.

**Assessment fee required*

The study develops preliminary engineering and scope to support timeline development, resource and material availability and associated costs to support the requested In-Service-Date.

**Agreement fee required.*

CCRA Agreement for project design and build. Covers customer load guarantees, cost responsibility and financial credits.

**Customer Capital Contribution may be required.*

Design and construction of facility per IESO Market Entry Process, & CCRA,

Apply to OEB for Wholesaler License; register as Market Participant with IESO.

Obtain other approvals as needed

Commissioning completed via the COVER process to support ESA inspections and connection interface testing.

Customer to provide as-built drawings, execute Transmission Connection Agreement, and notify IESO for supply of power commercial arrangements.

Hydro One's Connection Process

Phase 1: Connection Application
(Approximate timeline = 1 – 2months)

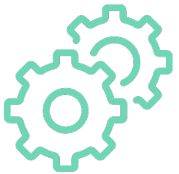
- **Preliminary Assessment**
  - Customer contacts Account Executive to initiate a consultation with Transmission System Planning
  - Purpose: Understand connection requirements and discuss available options
- **Discussion Topics -** Connection facilities, general technical requirements, budgetary costs and responsibility for connection work
- **Who Applies -** Customer completes Customer Connection Application
  - If customer builds station → customer applies
  - If transmitter builds station → transmitter applies

- **Common Application** with IESO:
  - Link: Connection Assessment and Approval (CAA) application form
  - Include: ✓Single Line Diagram ✓Protection & Operation Philosophy ✓Site layout

Hydro One's Connection Process

Phase 2: Customer Impact Assessment
(Approximate timeline = 4 – 6 months)

- Draft SIA Completion
  - Triggers Account Executive and Transmission System Planning to initiate the CIA.
  - The CIA identifies significant impacts, if any, to other affected transmission customers
- Agreement & payment
  - Customer executes agreement and provides payment to Hydro One to begin CIA study
- Final CIA report Issued to:
  - IESO
  - Connection Applicant
  - ESA
  - Other transmission-connected customers in study area.



Hydro One's Connection Process

Phase 3: Connection Cost Estimate
(*Approximate timeline = 8+ months)

- **Scope Agreement**
  - Customer & Account Executive agree on the scope of work to develop a cost and schedule estimate for their physical connection
- **Contestable work discussed and scope delineated –**
  - (1) Customer build and own; (2) Customer build and transfer of ownership to Hydro One; (3) Hydro One builds and owns.
- **Agreement & payment**
  - Customer executes agreement and provides payment to Hydro One
- **Customer provides -** all engineering details to perform this estimation phase
- **Hydro One delivers -** customer the cost estimate, project plan and associated timelines for their proposed connection

Hydro One's Connection Process

Phase 4: Connection Cost Recovery Agreement (CCRA)
(Approximate timeline = 1+ months)

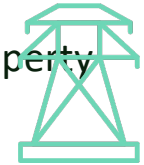
- **Agreement** - customer and Hydro One negotiate and execute the CCRA
- **CCRA outlines -** project design and build scope, customer load guarantees, cost responsibility, project schedule, and contestable assets transfer (if applicable)
- **Upon CCRA execution –**
  - Customer begin milestone payments related to connection cost
  - Funds release to proceed with detailed engineering, order equipment, and acquire the necessary approvals, permits, and licenses for the project
- Customer and Hydro One Acquire Regulatory Approvals, if applicable
- ***Hydro One and the customer commit to a connection in-service date***

Hydro One's Connection Process

Phase 5: Design and Build

(Approximate timeline = 1 – 2 Years)

- **Project Execution -**
  - Build connection as per the CCRA
  - Finalize Engineering
- **Procurement & Approvals -**
  - Procure necessary equipment, project materials, obtains necessary easements/property rights
  - receive necessary construction approvals and permits.



- **Standards -** Build site to transmission design and construction standards, operating and maintenance standards and commissioning requirements.
- **Coordination -** Hydro One construction is coordinated with customer's construction schedule

Hydro One's Connection Process

Phase 6: Commissioning & TCA
(Approximate timeline = 1 – 2 months)

Commissioning Phase

- Testing & Inspection of the connection facility to prepare for In-Service date (COVER)
- Customer submits the final as-built drawings

Transmission Connection Agreement (TCA)

- The Account Executive and the customer finalize the TCA and include:
  - Operating Schedule
  - transmission tariffs
  - high-voltage equipment data
  - Special connection considerations.

Connection facility goes into service

Hydro One's Connection Process – Fees

Items	COST PER STUDY
CIA study	$15,000 + HST
Complex CIA study	Actual Costs
Detailed Connection Estimate Studies	Actual Costs
Connection Cost Recovery Agreement (actual connection)	Actual Costs
*COVER and or design reviews (existing connections)	Actual Costs
*Feasibility Studies (phase 0)	Actual Costs
*Preliminary Engineering Agreement	Actual Costs
*Pre-CCRA Letter Agreement for Purchase of Long Lead Items	Actual Costs

** means if required*

Before You Apply

Engage with us early. It's important to get in touch with Hydro One to discuss your future plans as planning and infrastructure can take time.

To get started, submit the **Transmission Customer Preliminary Inquiry Form** available at Transmission Connections (hydroone.com).

Once received, one of our **Large Customer Account Executives** will contact you via email, phone or, if need be, meet you in-person, to discuss your connection.

Apply

With help from your **Large Customer Account Executive**, submit your connection application. For more detailed information about the Tx Load Connection Process, please visit **Transmission Connections (hydroone.com)** or email **LargeAccounts@HydroOne.com**.

III. Reliable Integration

Reliable Integration

- The IESO maintains the reliability and operability of the IESO-Controlled Grid (ICG) and the IESO-administered markets (IAM) by ensuring new Market Participants (MPs) are appropriately authorized and their applicable facility/equipment is registered well before energization.
- The IESO reviews all the information your organization submits to allow you to participate in the IAM and ensure any connection obligation identified in the applicable connection assessment is fulfilled.
- It also confirms that the physical facility is represented and modelled by IESO systems in a manner that accurately reflects operational and settlement requirements.

Reliable Integration

- Upon completion of the reliable integration activities, a Registration Approval Notification (RAN) will be issued to the MP.
- The IESO will then issue an invoice to the MP to cover the total costs and expenses incurred by the IESO in conducting these activities.
- Refer to Market Manual 0.1.5 for more information on Market Registration procedures.
- Average registration timeline:
  - 1 month for organization registration and authorization as MP
  - 8 months for new facility registration
  - 9 months for Remedial Action Scheme (RAS) changes

When is a RAN required?

New generation, load or storage facilities

Replacement of high voltage equipment such breakers, switches, capacitors, etc.

New transmission facilities or modifications to existing transmission facilities

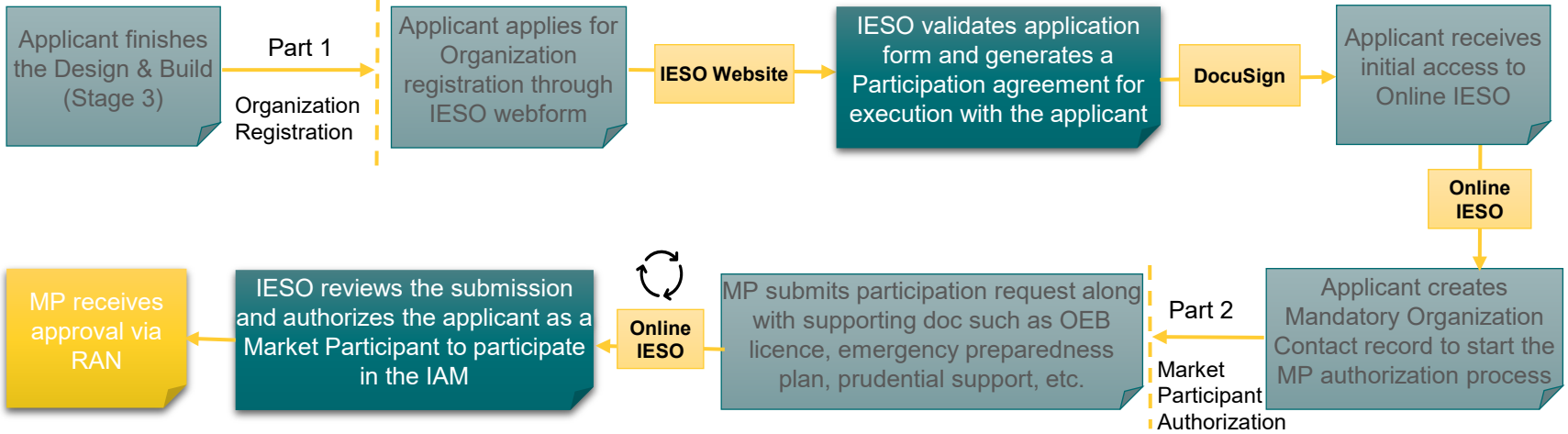
Modifications to existing generation, load or storage facilities

Modifications to Remedial Action Scheme (RAS)

Market and Program Participation

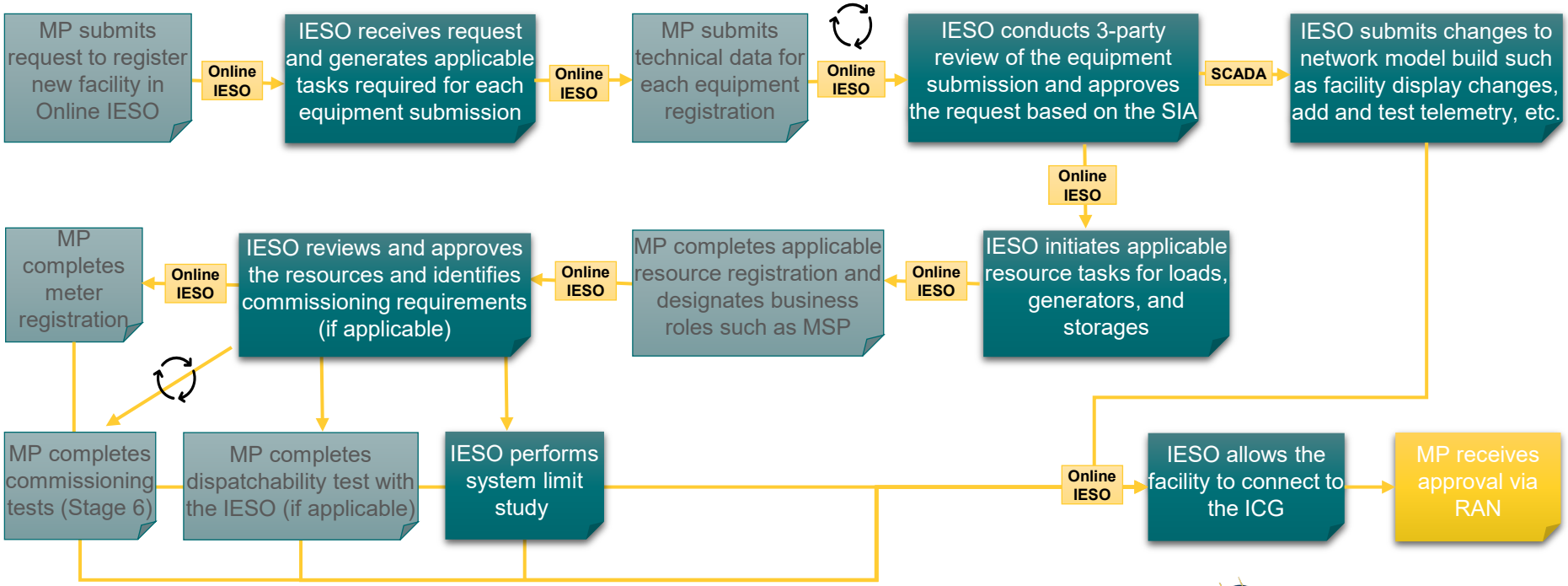
Stage 4: Authorize Market and Program Participant

This high-level diagram provides an illustrative overview of the steps required to complete the organization registration process and authorization as a Market Participant.



Stage 5: Register Equipment

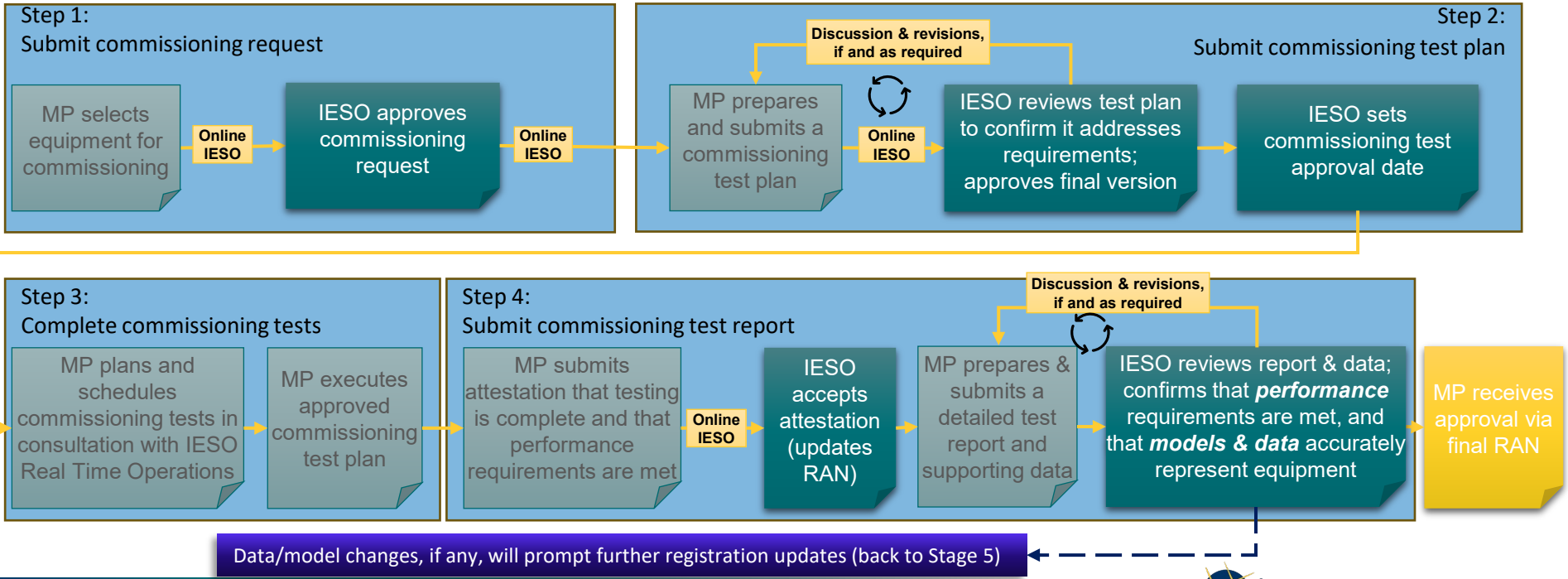
This high-level diagram provides an illustrative overview of the facility registration process.



Stage 6:
Commission Equipment and Validate Performance

Stage 6: Commission Equipment and Validate Performance

This high-level diagram provides an illustrative overview of the commissioning and performance validation process.



Performance Validation Objectives:

- The Performance Validation process has two main objectives:
  1) Confirm that equipment ***performance*** meets requirements specified in the Market Rules & Manuals, Connection Assessment Report (SIA), etc.; and
  2) Ensure ***data and models*** are sufficiently accurate, complete, and understandable for the IESO to use when making planning and operating decisions
- Different information may be needed for different purposes, and may include:
  - Steady-state ratings and capabilities (e.g., voltage/current/power/impedance);
  - Dynamic models for phasor-domain (PSSE) & electromagnetic transient studies (PSCAD)
  - protection scheme & settings information, control system descriptions, etc.

Connecting to Ontario's Power System
Reliable Integration - Wholesale Metering

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Wholesale Metering

- Wholesale Metering measures the energy conveyed in and out of the IESO-controlled grid to provide the metering data to settle the IESO-administrated markets, transmission services, and programs
- Metering is the basis for deriving all settlement charges and payments that a market participant will make or receive for its physical market transactions
- All energy bought or sold by market participants **must be measured and recorded by registered metering installations,** for both directly connected and embedded facilities
- Successful completion of the metering registration process supports the RAN approval and subsequently permitting the facility to connect to the ICG

Wholesale Metering – Cont'd

- Wholesale Metering, a.k.a as Revenue Metering or Settlement Metering, **must not be confused with**:
- **Smart Metering Entity (SME)**: - responsible for the operation of the province's Meter Data Management/Repository (MDM/R). The MDM/R serves as a central database for storing, processing, validating and managing information about hourly electricity consumption that supports the billing processes of local distribution companies (LDCs). [Ref: https://www.ieso.ca/sector-participants/smart-metering-entity]
- **Operational Metering (**Telemetry/SCADA): - provides real-time data to IESO for directing, monitoring and managing the ICG in real time operations

Wholesale Metering: Governance Rules

- Measurement Canada, establishes rules and requirements for electricity meters

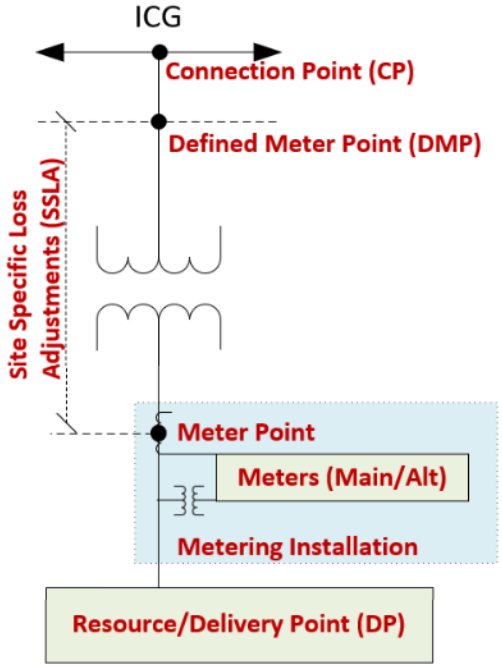
  [Ref: https://ised-isde.canada.ca/site/measurement-canada/en]

- Market Rules, approved by the IESO Board of Directors, which govern the IESO-controlled grid and IESO-administered markets: Chapter 6 - Wholesale Metering, Chapter 6 - Appendices, Chapter 9 - Settlements and Billing, Chapter 9 - Appendices, Chapter 10-Transmssion Service and Planning, Chapter 11-Definitions

- Market Manuals and procedures, approved by IESO management, and which provide more detailed descriptions of the requirements for various activities specified in the Market Rules, including the forms and agreements required by market participants: Market Manual 3 Series: Metering

  [Ref: https://www.ieso.ca/Sector-Participants/Market-Operations/Renewed-Market-Rules-And-Manuals-Library]

Wholesale Metering: Relevant Terms



- **Connection Point:** means the point of connection to the ICG
- **Defined Meter Point:** means the point where settlement transactions are settled between the market and the market participant
- **Metering installation:** means any apparatus, including but not limited to meters, instrument transformers, and communication system used to measure electrical quantities and transfer metering data to IESO systems
- **Meter:** a device that measures and records energy and shall be deemed to include the data logger but to exclude the instrument transformers
- **Meter Point:** the physical location of the current transformers used to measure electrical quantities
- **Resource:** means an IESO-modelled representation of one or more generation units, electricity storage units, or sets of load equipment, existing within the IESO's systems, which is used for the secure operations of the ICG, or to participate in the IAM
- **Delivery Point:** means a uniquely identified reference to a resource and represents the logical reference for settlements in the wholesale energy market, and for the transmission tariffs market
- **Site Specific Loss Adjustments (SSLA):** means electrical system losses and consider line and transformation losses, including load and no-load losses

System Impact Assessment: Metering Requirements

SIA: Metering Requirements

- The SIA report will capture the metering requirements under “General Requirements” if there are no specific metering requirements, or under “Specific Requirements” if there are specific metering requirements

SIA: Metering Requirements – Inputs

- As a minimum, the Connection Applicant shall provide:
  - Operating philosophy
  - Single line diagram* that includes the proposed meter points, the connection point(s) and the defined meter point(s)
- IESO will:
  - Confirm the connection point(s) and the defined meter point(s)
  - Determine the required number of resources to be modeled

* Market Manual 3.6 – Conceptual Drawing Review provides additional information for preparing single line diagrams of proposed metering installations. IESO recommends engaging an accredited Metering Service Provider to help with the preparation of the single line diagram.
[Ref.: https://www.ieso.ca/-/media/Files/IESO/Document-Library/Renewed-Market-Rules-and-Manuals/market-manuals/metering/ieso-me-conceptual-drawing-review.pdf]

SIA: Metering Requirements – Outputs

General Requirements

- Reference to applicable wholesale metering market rules

Specific Requirements

- Recommended metering configuration(s)
- Number of metering installations and location of their meter points
- References to the applicable wholesale metering market rules, as required
- Specific instructions or recommendations, as required

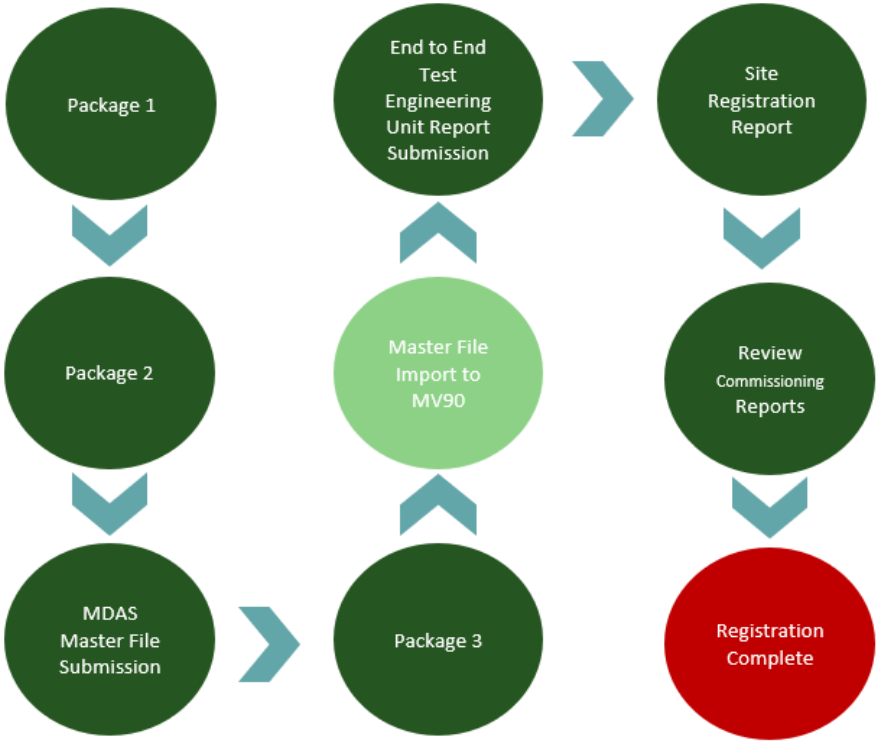
Grid Connection - Metering Registration

Metering Registration

Metering Registration: Roles and Responsibilities

- **Market Participant (MP)** – Person authorized by the market rules to participate in the IESO-administered markets or to cause/permit electricity to be conveyed into, through, out of the IESO-controlled grid. Assigns the MMP.
- **Metered Market Participant (MMP)** – Person associated with settlement of an energy delivery point. Assigns the MSP for an energy delivery point.
- **Metering Service Provider (MSP)** – Person that provides, installs, commissions, registers, maintains, repairs, replaces, inspects and tests metering installations.
- **Metered Market Participant Transmission (MMPT)** - Person associated with settlement of a transmission delivery point. Assigns the MSP for a transmission delivery point.

Metering Registration: Process Workflow



Metering Registration: Process Activity

Package 1

Single Line Diagram (SLD) Verification

- Review of meter points
- Assessment of instrument transformers
- Assessment of embedded vs direct connection

Metering Registration: Process Activity – Cont'd

Package 2

Review and approval of:

- Emergency IT Restoration Plan (EITRP)
- Site Specific Loss Adjustment (SSLA)
- Measurement Error Correction (MEC)

Metering Registration: Process Activity – Cont'd

- Meter Data Acquisition System (MDAS) Master File submission by the metering service provider
- Provides specific configuration information for the meter at that meter point ID

Metering Registration: Process Activity – Cont'd

Package 3

Review and Approval of the Totalization Table

- The totalization table algebraically maps meter point IDs to a delivery point
- The totalization table also identifies any measurement error correction factors, site specific losses, station service load and, if applicable, total loss factors to be applied to metering data
- The IESO uses this data, adjusted and totalized at the delivery point, to:
  - settle metered market participant transactions in the wholesale energy market
  - calculate transmission charges for transmission tariffs customers

Metering Registration: Process Activity – Cont'd

End to End Test Engineering Unit Report Submission

This process confirms that the metering service provider agrees and certifies that the metering data recorded in the metering installation and the metering data recorded in the metering database is accurate

- Ensures that correct Master Files(s) are being used by the IESO
- Meter can be successfully interrogated
- IESO can synchronize the clock within the meter

Metering Registration: Process Activity – Cont'd

- The Site Registration Report (SRR) reflects all the parameters of the totalization table, except for the metered market participant and the metering service provider relationships
- Once signed off by the metering service provider (and the Transmitter, if applicable) the SRR becomes an official document to which the settlement for that delivery point will be invoiced

Metering Registration: Process Activity – Cont'd

- Each metering service provider is responsible for commissioning its metering installations in accordance with the market rules and all applicable standards and policies of the IESO
- The metering installation registration request is completed with the metering service provider submission and IESO acceptance of the commissioning reporting package
- The requirements for commissioning a metering installation are outlined in Market Manual 3.2: Meter Point Registration and Maintenance, Appendix B

[Ref.: https://www.ieso.ca/-/media/Files/IESO/Document-Library/Renewed-Market-Rules-and-Manuals/market-manuals/metering/ieso-me-meter-point-registration-and-maintenance.pdf]

Thank You

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Useful links

More information about the connection process can be accessed using the following links:

- Overview of the Connection Process
- Stage 1 – Prepare application
- Stage 2 – Obtain conditional approval to connect

  CAA Application form – used to initiate SIA and CIA
- Stage 3 – Design and build
- Stage 4 – Authorize Market and Program Participation
- Stage 5 – Register equipment
- Stage 6 – Commission equipment and validate performance

  On-line IESO – used for stages 4, 5 and 6

Useful links

The following Market Manuals provide additional detailed information about connecting:

- 0.1.3 | Identity Management Operations Guide
- 0.1.4 | Connection Assessment and Approval
- 0.1.5 | Market Registration
- 0.1.6 | Performance Validation
- 0.1.7 | Synchrophasor Data Requirements