Distributed Energy Resources (DER) Connections Review

EB-2019-0207

Tranche 2 - A Deeper Dive

May 26, 2020

Working Group Material

Agenda

1. Introduction – Webex, Overview of Scope

2. Tranche 2 - A Deeper Dive, Update on Recommendations, Issues Tracking Tool

3. Tranche 2 - Priorities
   - Top 3 Priorities Issues Identification & Definition
   - Mandate for Subgroups

4. Next steps and action items

Introduction

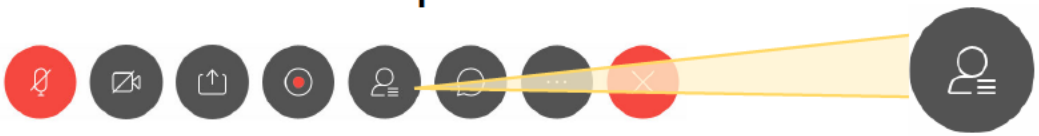
- Webex Control bar (all options shown may not be available)

Mute *Video* *Share* *Recorder* *Participants* *Chat* *Options* *Exit*

- Please keep your microphones muted unless you are speaking.
- Please remember to identify yourself and organization when speaking.

Introduction

- Webex has a “raise your hand” feature that notifies the host that you would like to speak
- Please use “raise your hand” to participate in the meeting.
  1. Click on the Participants icon on the Webex control bar



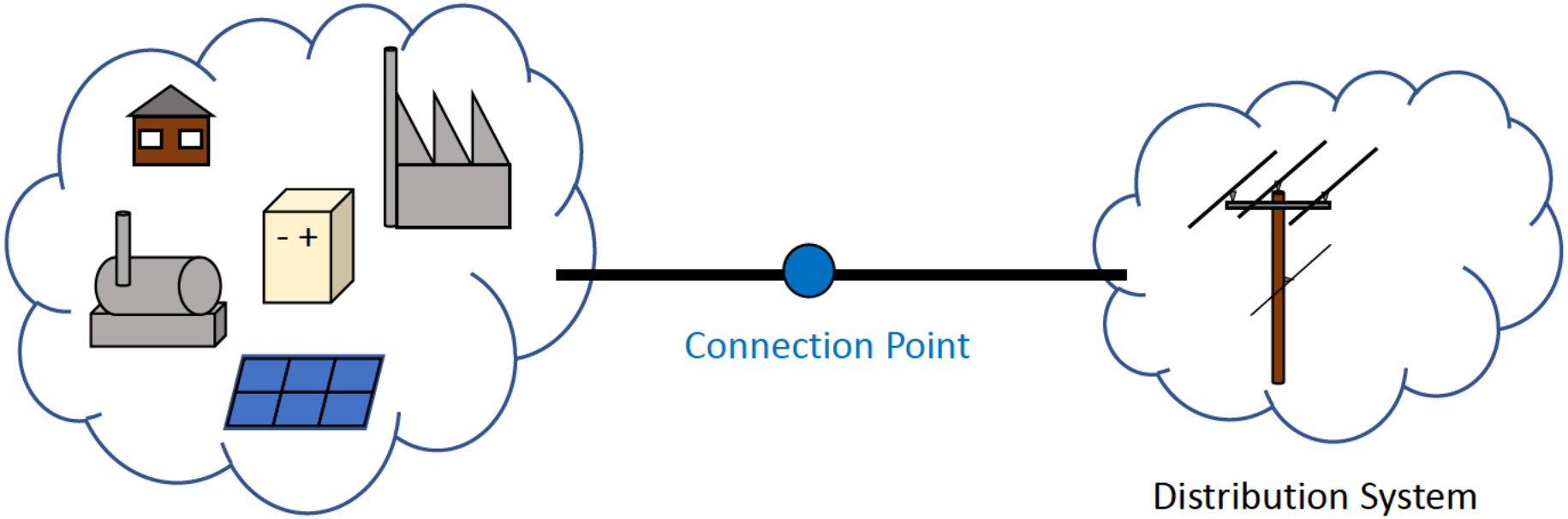
  1. In the Participants window that opens on the right side of your screen, please clicking on the hand symbol next to your name

- Please remember to identify yourself and organization when speaking

Introduction - Stakeholder Issues

- ✓*Raised questions about terminology and regulatory rules in respect to DERs*
- ✓*Are concerned with cost responsibility and the need for clear rules.*
- ✓*Are seeking solutions that will reduce connection timelines.*
- ✓*Are seeking clarity and consistency about technical requirements.*
- ✓*Want clear and consistent connection rules and requirements*

Scope Recap

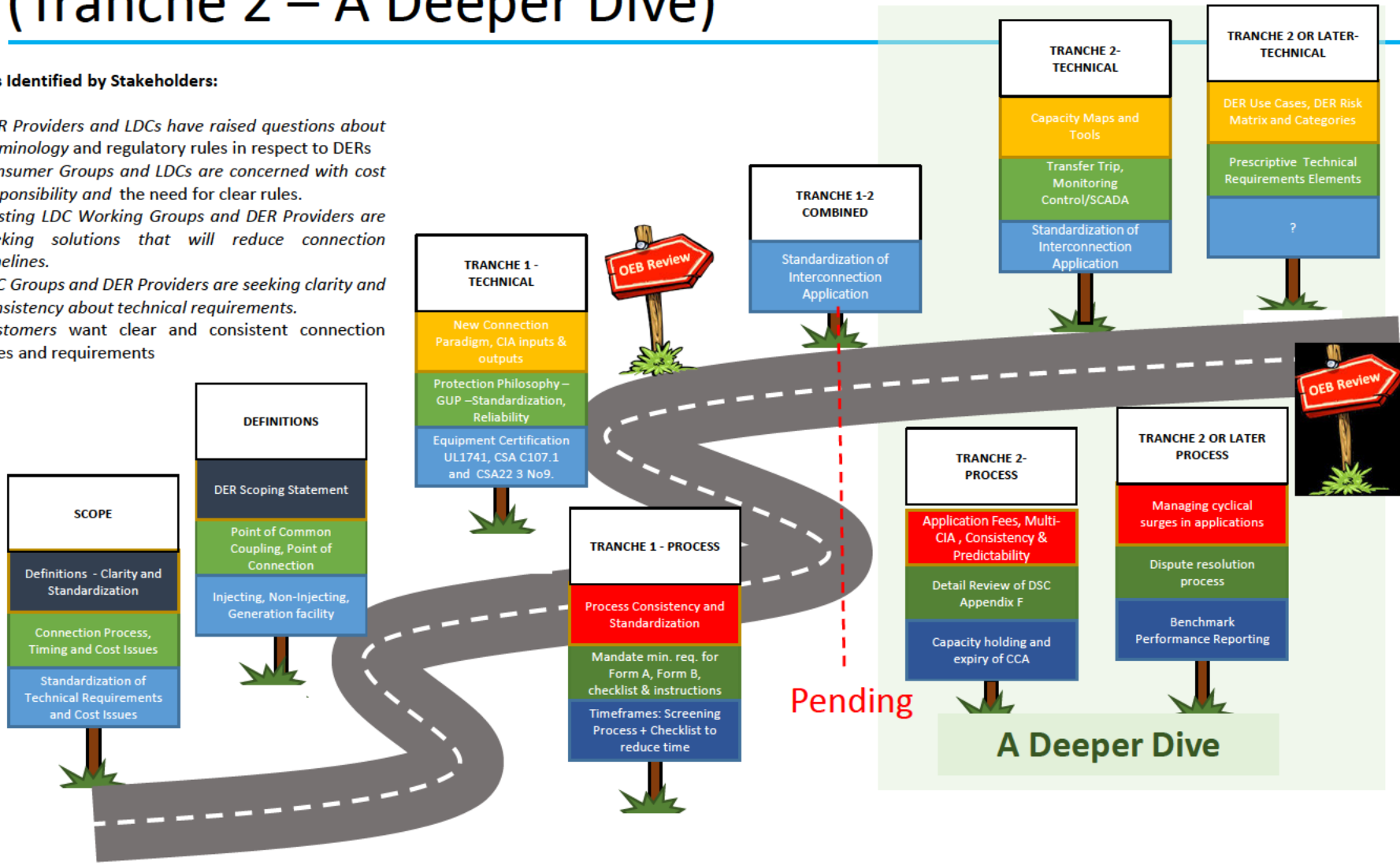


- Working group to focus on the connection point of a generation or energy storage DER to a distribution system.

DER Connections Review Strategic Plan Roadmap (Tranche 2 – A Deeper Dive)

Issues Identified by Stakeholders:

- ✓ *DER Providers and LDCs have raised questions about terminology* and regulatory rules in respect to DERs
- ✓ *Consumer Groups and LDCs are concerned with cost responsibility and* the need for clear rules.
- ✓ *Existing LDC Working Groups and DER Providers are seeking solutions that will reduce connection timelines.*
- ✓ *LDC Groups and DER Providers are seeking clarity and consistency about technical requirements.*
- ✓ *Customers* want clear and consistent connection rules and requirements



Working Subgroup Material

Recommendations Development

Recommendations (Status Review)

Recommendations that have been Moved Forward

1. Preliminary Consultation Application Form
2. Preliminary Consultation Report
3. Screening Process
4. Sample Protection Philosophy
5. ESA Equipment Certification (*Completed –Sent to ESA)*

Recommendations Under Development

6. Connection Impact Assessment Application Form
    i. CIA Application Form
    ii. CIA Application Checklist
    iii. CIA Application Instructions

Recommendations Under Development

CIA Form, Checklist and Instructions

1. Connection Impact Assessment Application Form
   - OEB would ***mandate minimum requirements*** for a Connection Impact Assessment Application *and* ***provide as guidance*** a template form that utilities may use[1]. Utilities wishing to use an alternate form must file the alternative form with the OEB so that the OEB can, from time to time, monitor and evaluate its effectiveness for the goals of a consistent, transparent, and efficient process.

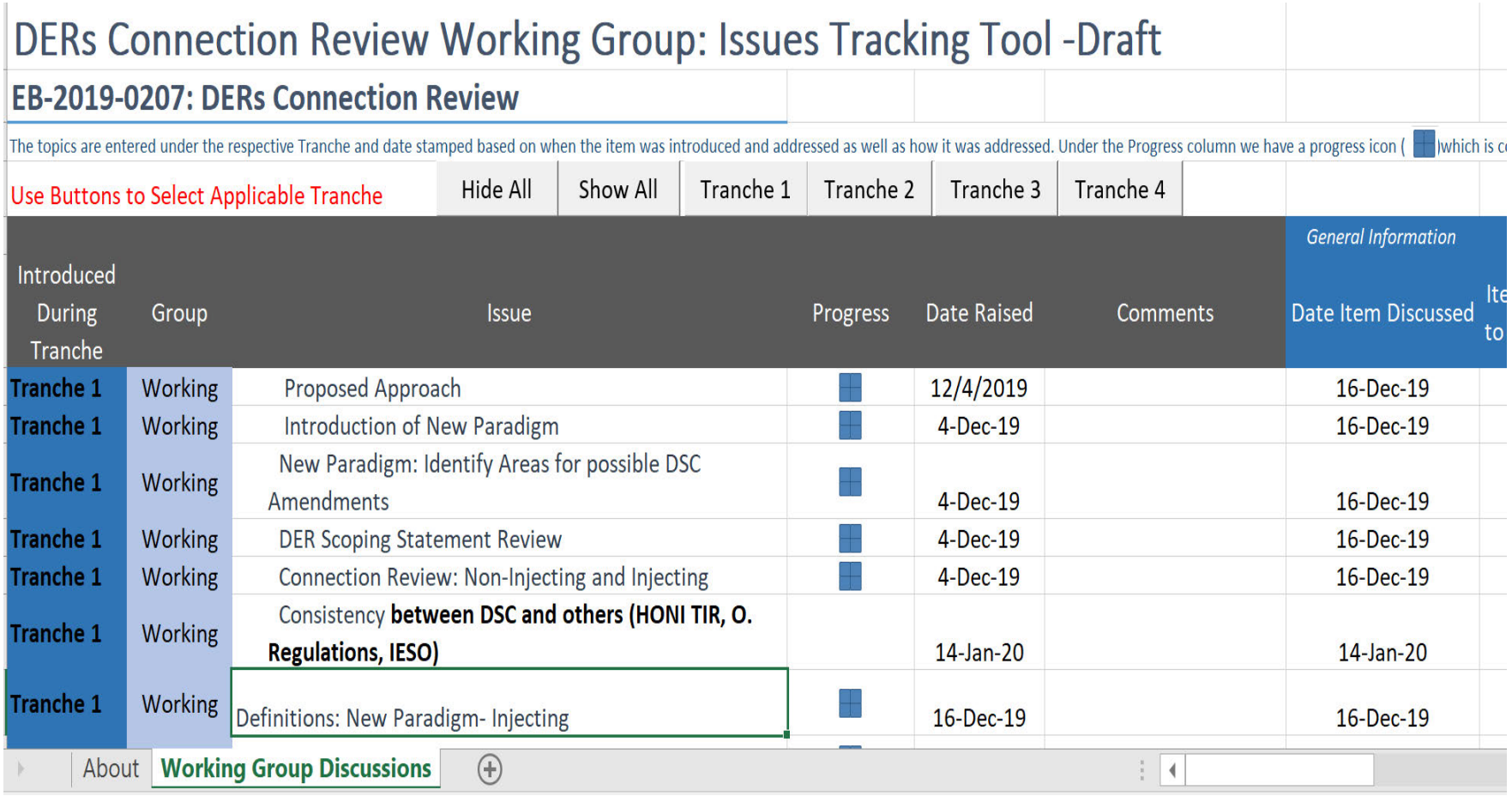
     1. Does not preclude the use of web-based versions of the PCA

   Content still under development
   - The subgroups have agreed to continue developing the content of the form. This work may proceed in parallel with the Tranche 2 discussion or be included as part of these discussions.
   - Content includes the completion of the Connection Impact Assessment Application form with instruction and checklist documents to assist proponents with the application.

Ontario Regulatory Framework

- Legislation (must)
  - *Electricity Act, 1998*
  - *Ontario Energy Board Act, 1998*
  - Ontario Regulations as authorized by legislation
    eg: O.Reg. 326/09: Mandatory Information RE Connections
- Licences based on activities named in legislation (must)
  eg: Distribution, Transmission, Generation, Electricity Retailer
- Codes as a condition of Licence (must)
  eg: Distribution System Code, Reporting and Recordkeeping Requirements (RRR)
- Bulletins and Guidelines (information and guidance)
  eg: Filing Guidelines, FAQs, implementation of the Ontario Electricity Rebate

Issues Tracking Tool



DERs Connection Review Working Group: Issues Tracking Tool -Draft

EB-2019-0207: DERs Connection Review

The topics are entered under the respective Tranche and date stamped based on when the item was introduced and addressed as well as how it was addressed. Under the Progress column we have a progress icon ( )which is c

Use Buttons to Select Applicable Tranche | Hide All | Show All | Tranche 1 | Tranche 2 | Tranche 3 | Tranche 4

Introduced During Tranche	Group	Issue	Progress	Date Raised	Comments	General Information: Date Item Discussed	Ite to
Tranche 1	Working	Proposed Approach		12/4/2019		16-Dec-19	
Tranche 1	Working	Introduction of New Paradigm		4-Dec-19		16-Dec-19	
Tranche 1	Working	New Paradigm: Identify Areas for possible DSC Amendments		4-Dec-19		16-Dec-19	
Tranche 1	Working	DER Scoping Statement Review		4-Dec-19		16-Dec-19	
Tranche 1	Working	Connection Review: Non-Injecting and Injecting		4-Dec-19		16-Dec-19	
Tranche 1	Working	Consistency **between DSC and others (HONI TIR, O. Regulations, IESO)**		14-Jan-20		14-Jan-20	
Tranche 1	Working	Definitions: New Paradigm- Injecting		16-Dec-19		16-Dec-19	

About | Working Group Discussions

Lean Process

Applied Lean Principles *(removing waste in the process)*

Applied during Tranche 1

- Standardization and streamlining
  - Forms, instructions, definitions
- Process quality build in
  - Error proofing, e.g. checklists and screening process to reduce rework and end to end cycle time

Consider for Tranche 2

- Standardization and streamlining
  - Definitions, bulletins, code amendment
  - Concurrent steps where possible to reduce process end to end cycle time
- Stakeholder education to reduce rework, reduce risk and improve clarity
  - Examples and use cases

Top Priorities for Tranche 2

What is it and what is needed, who has to do it and how are the cost addressed?

Technical	• Capacity Maps
Technical	• Transfer Trip
Process	• Process Timelines
Process	• Dispute Resolution Process
Combined	• Benchmark Performance Reporting *(May be out of scope)*
Combined	• Standardization of DER Interconnection Application Forms*
Process	• Interconnect Cost Consistency & Predictability
Process	• Capacity Charge *(May be out of scope)*
Technical	• Utility/HONI Monitoring Control/SCADA
Technical	• Standardization of Maximum Energy Storage System Size
Technical	• Prescriptive Protection Philosophy Elements

**Continuation of content development for CIA Form B Tranche 1 recommendation*

Tranche 2 Priorities

Capacity Map

- Problem Identification

– Why are Capacity Maps needed?
  - Information requirements
  - O.Reg 326/09 requirements

– Who has to provide the information?
  - O.Reg 326/09 requirements
  - Where does it reside
  - How difficult is it to retrieve this
  - How should it be provided

– What are the cost implications?

Ontario Regulation 326/09

Connection requirements, distribution systems

2. (1) For the purposes of this Regulation, where a generator is seeking to connect a renewable energy generation facility to a distributor's distribution system, the distributor shall,

(a) provide the applicable assessment of the renewable energy generation facility's connection application provided for in section 6.2 of the Board's Distribution System Code and shall do so within the time provided in the Code;

(b) provide the assessment required under clause (a) to the generator within 120 days after the date when the distributor commences the assessment provided for in clause (a), where the applicable connection impact assessment requires the distributor to apply to their host distributor for a connection impact assessment; and

(c) on behalf of the generator, apply for a connection assessment to the IESO under section 6.1.6 of chapter 4 of the market rules, if the renewable energy generation facility has a name-plate capacity of 10 megawatts or greater. O. Reg. 326/09, s. 2 (1).

(2) Where a distributor makes an application to the IESO under clause (1) (c), the IESO shall provide the distributor with an assessment of the impact or potential impact of the connection on the integrated power system within 150 days after the day the IESO receives the application. O. Reg. 326/09, s. 2 (2).

(3) An application for connection assessment is complete when it contains information sufficient to allow a distributor to carry out its connection assessment activities. O. Reg. 326/09, s. 2 (3).

(4) A distributor shall meet the time requirements for the connection assessment process that are applicable to the generation facility, given its name-plate capacity, when a generator is seeking to connect a renewable energy generation facility to the distributor's distribution system. O. Reg. 326/09, s. 2 (4).

For renewable energy generation facility, complete CIA in 120 days and SIA in 150 days

Reporting, Distributors

4. (1) For the purposes of subsection 25.37 (3) of the Act, the information that the distributor files with the Board shall include,

(a) the number of connection impact assessments for renewable energy generation facilities with a name-plate capacity of greater than 10 kilowatts and of offers to connect renewable energy generation facilities with a name-plate capacity of 10 kilowatts or less completed or made within the previous quarter; and

(b) the number of instances where the assessments have not been provided within the time provided for in subsection 2 (1), for each of the connection impact assessments referred to in clause (a) that have been completed by the distributor. O. Reg. 326/09, s. 4 (1).

Per quarter, report on #CIA's for REG>10kW, #OTC for REG<10kW

(2) For the purposes of subsection 25.37 (3) of the Act, a **distributor shall provide information**, to be updated on at least a quarterly basis, **to the public regarding the capacity of the distributor's distribution system** to accommodate generation from renewable energy generation facilities, including,

(a) voltage level;
(b) maximum and minimum load;
(c) fault level;
(d) available capacity to connect generation; and
(e) the information required by the Board's Distribution System Code. O. Reg. 326/09, s. 4 (2).

(3) The distributor shall provide the information referred to in subsection (2),

(a) in respect of **each of the distribution system's feeder lines** that are directly connected to a transformer station that is itself directly connected to a transmission system; and

(b) in respect of each of the **distribution system's feeder lines that are not directly connected to a transformer station** that is itself directly connected to a transmission system for which an application has been received from a generator in respect of a renewable energy generation facility with a name-plate capacity **of greater than 10 kilowatts**. O. Reg. 326/09, s. 4 (3).

Working Group Material

Reporting, Distributors

(4) A dis**tributor shall provide information to the public**, and update it at least on a **quarterly basis**, **regarding a listing of current applications for the connection** of renewable generation facilities **by application date** and including the proposed name-plate capacity associated with each renewable energy generation facility in respect of each application. O. Reg. 326/09, s. 4 (4).

(5) The distributor shall provide the information referred to in subsection (4) to the public in respect of each feeder line within the distributor's distribution system for which an application has been received from a generator in respect of a renewable energy generation facility with a name-plate capacity of greater than 10 kilowatts. O. Reg. 326/09, s. 4 (5).

On a quarterly basis, provide a listing (queue) of current applications for connection by feeder

(6) A distributor shall provide, as soon as is practicable and no later than five days after receipt of a complete application for connection, written notice to all distributors and transmitters whose distribution or transmission systems are impacted by an application to connect to a distributor's distribution system. O. Reg. 326/09, s. 4 (6).

5 Days to notify host distributor or transmitter

Reporting, IESO

5. For the purposes of subsection 25.37 (3) of the Act, the information that the IESO files with the Board shall include,

(a) the number of assessments completed within the quarter; and

(b) for each completed assessment, the time between the receipt by the IESO of a completed application for connection and the date that the assessment is issued. O. Reg. 326/09, s. 5.

6. Omitted (provides for coming into force of provisions of this Regulation). O. Reg. 326/09, s. 6.

On a quarterly basis, IESO reports # of assessments and time to complete metrics

Tranche 2 Priorities

Dispute Resolution

- Problem Definition
- Currently existing processes:
  - Dispute Resolution Process in the LDC Conditions of Service (Filed with OEB)
  - IRE Process with the OEB
- Alternative Options:
  - Third Party Mediation
  - Ombudsman / Commissioner

Example of Disputes Process

Step 1: Contact Hydro One - Customers may call 1-888-664-9376 M - F, 7:30am to 8:00pm

Step 2: Speak to a Supervisor – If the issue is not resolved, Customers may ask to speak to a supervisor, who will work with them to resolve the concern.

Step 3: Escalate to Customer Relations - Customer complaints that cannot be resolved by calling the Customer Contact Centre are referred to Hydro One's Customer Relations department. A member of Customer Relations will contact the Customer, research, investigate, and follow up (when necessary) with the complainant to ensure resolution and closure. Hydro One's Customer Relations may be reached as follows: Website: www.HydroOne.com Email: CustomerRelations@HydroOne.com

Step 4: Direct concerns to the Hydro One Ombudsman – Customers who go through Hydro One's complaint process and still are not satisfied may contact Hydro One's Ombudsman. Hydro One's Ombudsman may be reached as follows: Telephone: 1-844-608-8756. Website: www.HydroOneOmbudsman.com ,Email: Ombudsman@HydroOne.com

Top Priorities for Tranche 2-Reordered

What is it and what is needed, who has to do it and how are the cost addressed?

- Capacity Maps and Queues
- Dispute Resolution Process
- Review of Process Flow Chart (Risk)
  - Categorization based on size and/or …
  - Process Timelines
  - Prescriptive Protection Philosophy Elements
    - Utility/HONI Monitoring Control/SCADA
    - Transfer Trip
  - Standardization of DER Interconnection Application Forms*
  - Interconnect Cost Consistency & Predictability
- *Standardization of Maximum Energy Storage System Size*

**Continuation of content development for CIA Form B Tranche 1 recommendation*

Current DSC DER Categorization

Generator Classification	Rating	# of CIA's (Typical)
Micro	≤ 10 kW	No
Small	(a) ≤ 500 kW connected on distribution system voltage < 15 kV (b) ≤ 1 MW connected on distribution system voltage ≥ 15 kV	1
Mid-Sized	(a) ≤10 MW but > 500 kW connected on distribution system voltage < 15 kV (b) > 1 MW but ≤ 10 MW connected on distribution system voltage ≥ 15 kV	2
Large	> 10 MW	3

FERC / NREL / IREC Process Streams

Categorization	Screen
Level 1 Non-exporting (7 days to evaluate screen from notification of complete application)	1) Nameplate rating ≤ 25 kW with UL 1741 Inverter 2) On a radial circuit, total exporting generation ≤ 15% of the Line Section's annual peak load (as most recently measured at the substation or calculated for the Line Section) 3) On a 1ϕ shared secondary, aggregate generation capacity on the shared secondary ≤ 65% of the transformer nameplate power rating 4) 1ϕ interconnected on a transformer center tap neutral of 240V, it will not create an imbalance between the two sides of the 240V service of more than 20% of the nameplate rating of the service transformer 5) Within a Spot Network or Area Network, aggregated Nameplate Rating ≤ 50% of the Spot Network or Area Network's anticipated minimum load (Only the daytime minimum load considered for PV) - Utility choice of methodology options to calculate the anticipated minimum load

FERC / NREL / IREC Process Streams (2)

Categorization	Screen			
Level 2	Size	Line Capacity	Regardless of Location	On a ≥ 600 amp line and ≤2.5 miles (4km) from substation
Non-exporting		≤4 kV	< 1 MW	< 2MW
		5 kV – 14 kV	< 2 MW	< 3 MW
		15 kV – 30 kV	< 3 MW	< 4 MW
		31 kV – 60 kV	≤ 4 MW	≤ 5 MW
(15 days to evaluate screen after notice)	On a radial circuit, total exporting generation ≤ 15% of the Line Section's annual peak load (as most recently measured at the substation or calculated for the Line Section)			
	Aggregated generation contributes ≤ 10% to the circuit's maximum Fault Current at the point on the Primary level nearest the PCC			
Etc. (7 more)				

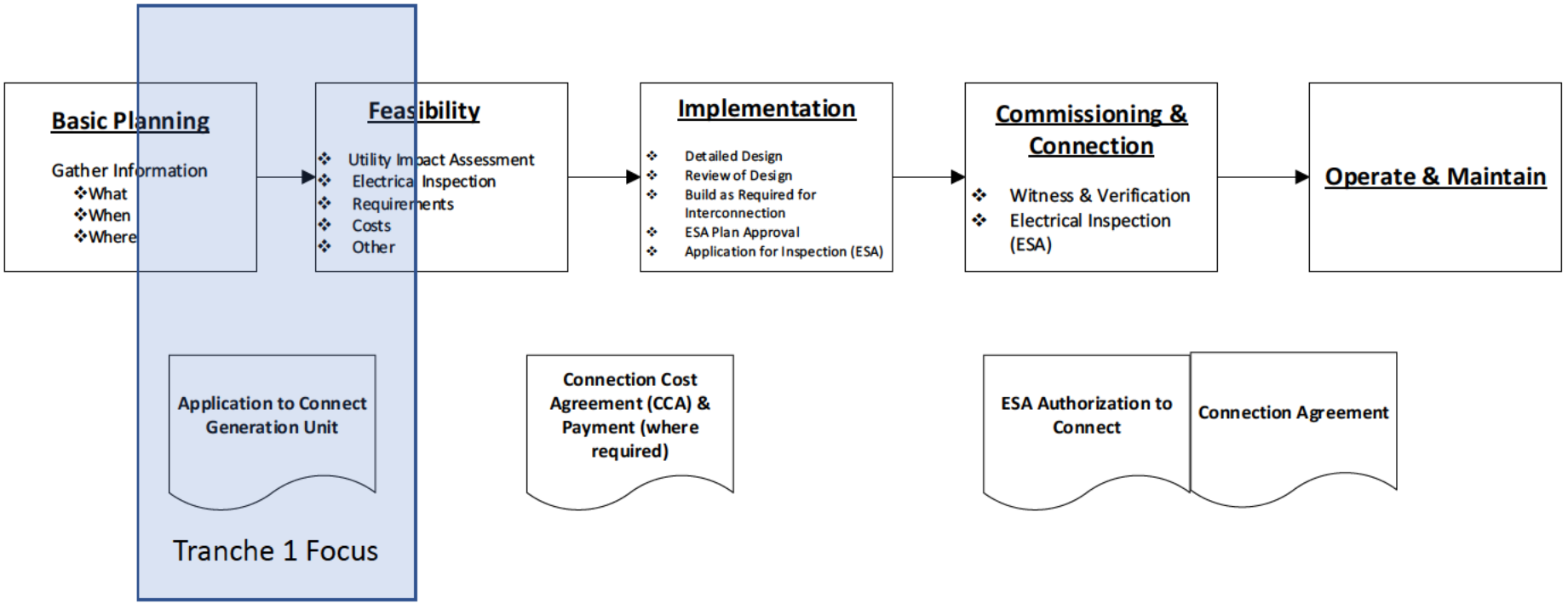
FERC / NREL / IREC Process Streams (3)

Categorization	Supplemental Review
Level 3	
Non exporting A non-exporting facility connecting to a spot network or an area network is not eligible for Level 3	Aggregated generation capacity <100% of minimum load for all Line Sections bounded by automatic sectionalizing devices upstream of the proposed facility
Within 20 days	In aggregate with existing generation on the Line Section • Voltage regulation can be maintained • Voltage fluctuation is within acceptable limits • Harmonic levels meet IEEE 1547 at the Point of Interconnection
Etc. (3 more)	

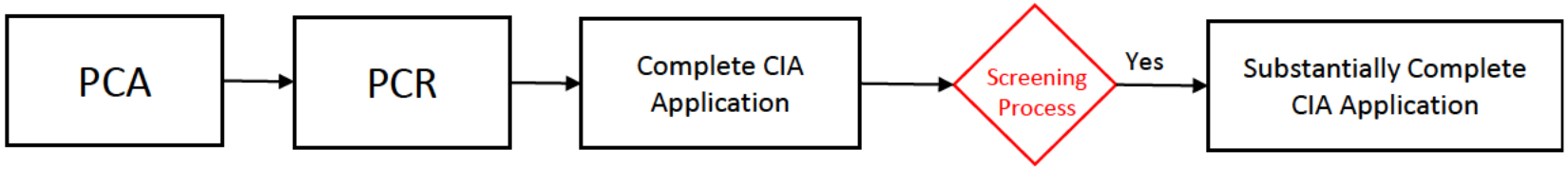
FERC / NREL / IREC Process Streams (4)

Categorization	Screen	
Level 4	Non-exporting: Failed 1, 2, or 3 Exporting	
Process	**Timing**	**Cumulative**
Application Options Meeting	10 days	10 days
Application and Fee	5 days	15 days
SIA Study Agreement	40 days	55 days
Facilities Study and fee If substantial changes to system	5 + 45 days	105 days
Interconnection Agreement Including timeline on utility work	5 + 40 days	150 days
Application commits to in-service date	< 2 years	

Generation Connection Process Summary



New and better Defined Process Steps from Tranche 1



Process Timelines Reduction (DMAIC Methodology)

- Define the problem
  - Process map (what are the necessary tasks to connect a DER)
  - Classify DERs
    - Injecting , non-injecting
    - Size
    - Use cases (what is the risk based model rather than size)
- Measure
  - Process cycle time
  - Time for each task
  - Safety and reliability
  - Cost
- Analyze
  - What is the time of each task
  - Where are the bottle necks
  - Which are the focus areas
- Improve – Make proposal and recommendations
- Control – Forms, Standardization, Code Amendment, Checklists, Instructions, Tracking

Process Timelines Reduction (Principles)

Every task can be grouped into three types:

- **Value-Added** tasks are those activities that generate value. These tasks advance the completion of the connection, and the customer is willing to pay for them. If an activity is not taking closer to the completion of a safe and reliable connection, it is not a value-added task.
- **Enabler tasks** either do not advance the completion of a connection, or the customer is unwilling to pay for them, but they are still required to be completed. An enabler task is non-value-added, but is still necessary. Project planning or quality testing are examples of enabler tasks.
- **Waste occurs** when a task is not desired by the customer, and the task does not advance the completion of the connection. Wasteful tasks are non-value-added and unnecessary. Wasteful activity would lead to rework , collecting unnecessary information or mandating unnecessary costly equipment.

The goal is to reduce the time required to complete connection by eliminating wasteful activities, and increasing the amount of time spent on value-added tasks.

General Mandate for Subgroups

Review of Technical Requirements and related Cost Issues

- Make recommendations for standardization of technical requirements for connections possibly through reference to outside standards or developing requirements.
  - **Tranche 2 Technical Subgroup mandate ?**

Review of Connection Process and related Cost Issues

- Review current processes and timeframes to identify and make recommendations to improve the connection process.
- This will include making recommendations for new or different processes possibly based on size or technology.
- Consider the cost of the connection process and options for reducing costs
- Consider and reflect on industry groups input (i.e. EDA, OEA, HONI TIR)
  - **Tranche 2 Process Subgroup mandate ?**

Mandate for Technical Subgroup

Review of Technical Requirements and related Cost Issues

- Make recommendations for standardization of technical requirements for connections possibly through reference to outside standards or developing requirements.

  Tranche 2 Technical Subgroup mandate focus

  - Capacity Maps and Queues
  - Review of Process Flow Chart (Risk)
    - Categorization based on size and/or
    - Prescriptive Protection Philosophy Elements
      - Utility/HONI Monitoring Control/SCADA
      - Transfer Trip
  - *Standardization of Maximum Energy Storage System Size*

Mandate for Process Subgroup

Review of Connection Process and related Cost Issues

- Review current processes and timeframes to identify and make recommendations to improve the connection process.
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- Consider and reflect on industry groups input (i.e. EDA, OEA, HONI TIR)

Tranche 2 Process Subgroup mandate focus

- Dispute Resolution Process
- Process Timelines
- Interconnect Cost Consistency & Predictability
- Standardization of DER Interconnection Application Forms*

Tranche 2 Mandate Focus for Subgroups

Technical

- Capacity Maps and Queues
- Review of Process Flow Chart (Risk)
  - Categorization based on size and/or
  - Prescriptive Protection Philosophy Elements
    - Utility/HONI Monitoring Control/SCADA
    - Transfer Trip
- *Standardization of Maximum Energy Storage System Size*

Process

- Dispute Resolution Process
- Process Timelines
- Interconnect Cost Consistency & Predictability

Other

- Standardization of DER Interconnection Application Forms*

**Continuation of content development for CIA Form B Tranche 1 recommendation*

Next steps

Next Working Group Meeting

- TBD

Next Subgroup Meeting

- Technical – Tues June 16, Wed July 8, Tues July 28
- Process – Tues June 16, Wed July 8, Tues July 28