Distributed Energy Resources (DER) Connections Review

EB-2019-0207 Working Group Meeting August 22, 2022 The Ontario Energy Board acknowledges that our headquarters in Toronto is located on the traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples. This area 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.

We are grateful for the opportunity to gather and work on this land and recognize our shared responsibility to support and be good stewards of it.

MS Teams – Mute and Raise Hand Feature

Please kindly mute microphone when not speaking.

Please use the Raise Hand feature (under the "Reactions" control) if you would like to speak during the meeting, and the presenter or OEB staff will call upon you.



When speaking, please start with your name and organization.

Agenda

No.	Discussion Item	Start	Duration
1.	Land Acknowledgement	1:00pm	5 mins
2.	Staff Update	1:05pm	5 mins
3.	FEI Update (in-meeting note: postponed to October)	1:10pm	15 mins
4.	Hydro One Transfer Trip Update	1:25pm	15 mins
5.	Process Subgroup Recommendations	1:40pm	45 mins
6.	Break	2:25pm	15 mins
7.	Technical Subgroup Recommendation (Uni-Directional EV)	2:40pm	30 mins
8.	Risk Framework Update	3:10pm	10 mins
9.	Open Discussion	3:20pm	25 mins
10.	Next Steps	3:45pm	15 mins

Staff Update

Meeting on 22 August 2022

Status of Tranche 4 Areas of Review

Topic Area	Status
Process: RRR Requirements	Subgroup Proposal Finalized
Process: Connection Cost Estimating	Subgroup Proposal in Development
Process: Connection Deposit Refund Timelines	Subgroup Proposal in Development
Process: Capacity Allocation Exemption	Subgroup Proposal Finalized
Process: Capacity Deposits	Subgroup Proposal Finalized
Technical: Expanded EV Issues List for Connections	Subgroup Proposal Finalized
Technical: Risk Framework Development	Subgroup Proposal in Development

Plan for Today

Items for Working Group Review & Finalization

The following are ready for review and finalization by the working Group:

- Process:
 - RRR;
 - CAE;
 - Capacity Deposits.
- Technical:
 - EV Issues List
 Augmented for Uni Directional Connections.

Items Under Development by Subgroup

The following are under development and not on today's agenda:

- Process:
 - Connection Cost Estimating;
 - Connection Deposit Refund Timelines.
- Technical:
 - Risk Framework.

Open Discussion on Additional Priorities

 Limited time for open discussion on subjects outside of Tranche 4, which will be discussed in September WG meeting.

Plan for Balance of Tranche 4

- By September 2022, expect to close remaining recommendations.
- By October 2022, expect to confirm the desire to continue with Tranche 5 to address any additional issues.

FEI Update

Postponed to next meeting

Meeting on 22 August 2022

Transfer Trip Update by Hydro One

Presentation by Adnan Akhtar (Hydro One)

Please refer to accompanying file

Process: RRR Proposal

Process Subgroup Topic 1

Presentation by Larry Herod (Stem & Enel X) & Andrew Houston (Alectra)

Please refer to accompanying file

Overview of RRR Proposal

Context	Recommendation	Anticipated Benefit
Non-NM DER Information Collected in Aggregate Only	Revise RRR for Non-NM DER to include breakout by DER type	Better visibility on type of DER installed in territory
Rate Class of NM Customers Not Reported in RRR	No action – other means seen as better-suited to obtaining information	N/A
Percent of Customers on Restricted Feeders Not Reported	Consider issue in context of RRR and non-RRR proposals	Additional time to develop optimal proposal
Question on Whether RRR Includes Total MW of DER	No action – existing RRR allows calculation	N/A

RRR Proposal (1 of 2)

The Subgroup proposes that RRR section 2.1.14 should be revised to require the following:

A distributor shall provide, annually by April 30, the following net metering and embedded generation information for the preceding calendar year (material changes in red):

- a) For net metered generators:
 - i. Number of generators by renewable energy source;
 - ii. Total installed capacity (kW) by renewable energy source; and
 - iii. Total installed capacity (kW) of storage devices used by net metered generators by renewable energy source;
- b) For embedded generation facilities excluding net metered generators:
 - i. Number of generators by facility type (solar, wind, water, biomass, fossil fuel, exporting storage, non-exporting storage, other);
 - ii. Total installed capacity (kW) by facility type (solar, wind, water, biomass, fossil fuel, exporting storage, non-exporting storage, other);

RRR Proposal (2 of 2)

The Subgroup proposes:

• That, in future meetings, it be permitted to review potential reporting requirements related to "percent of customers on restricted feeders". Discussions to-date found challenges in collecting this information, and loss of context in reporting a single figure; however, there was a desire to revisit the issue more broadly and determine whether a recommendation would be warranted, for example related to RRR, a referral to filing requirements staff, or some other proposal.

The Subgroup further notes:

- That it does not recommend a RRR requirement related to reporting of the type of net metered customers, since this can be obtained through other avenues and may not be needed on a recurring basis.
- That it does not see a need to recommend an additional RRR requirement on "installed capacity of DER" since this is captured in RRR section 2.1.14.

Process: Capacity Allocation Exemption Proposal

Process Subgroup Topic 4

Presentation by Jason Savulak (Hydro One)

Please refer to accompanying file

Overview of CAE Proposal

Context

- DSC established "Capacity Allocation Exempt" facilities, which do not follow a distributor's normal capacity allocation process.
- CAE established in 2009 to expedite smaller connections, which at the time were assessed to be fewer in number.
- Subgroup believes context has changed due to an increased number of smaller facility applications and higher DER penetration levels.
- Subgroup believes that the existing CAE requirements are not practical nor appropriate.

Recommendation

 Eliminate CAE designation and associated requirements from the DSC.

Anticipated Benefit

- Improve simplicity and practicality, having all projects greater than 10 kW follow the same process for capacity allocation.
- Align process with anticipated growth in smaller connections.

Process: Capacity Deposits Proposal

Process Subgroup Topic 5

Presentation by Larry Herod (Stem & Enel X)

Please refer to accompanying file

Overview of Capacity Deposit Proposal

Context

- For exporting projects* that do not hold an IESO contract that itself contains provisions for a security deposit, a capacity deposit of \$20k/MW is required at CCA signing, and after 15 months a further deposit is required if not already connected.
- Requirement was set in 2009 to ensure viable projects are not impeded by projects unlikely to proceed.
- Subgroup questioned practical effectiveness of provisions.
- * Exporting provision becomes effective October 1, 2022.

Recommendation

Remove capacity deposit requirement.

Anticipated Benefit

 Simplification of DSC requirements and removal of potential barrier, including for net metered projects.

Break

Meeting on 22 August 2022

Technical: EV Issues List for Uni-Directional Chargers

Technical Subgroup Topic 1

Presentation by Jordan Hoogendam (Zon Engineering), Kent Elson (Environmental Defence), & Adnan Akhtar (Hydro One)

Please refer to accompanying files

Bi-Directional EV Charger Connection Issues

Technical Challenge

- Bi-directional chargers can increase the total nameplate of installed DER at a connection point beyond the micro limit of 10 kW.
- LDC may not have visibility on all EV deployments (unior bi-directional).
- Certification standards for stationary and mobile inverters fall under different jurisdictions.

Application Challenge

- Application forms do not explicitly list bi-directional EVs.
- CIA application cost can be prohibitive for 10-30 kW installations.
- Requirement for CIA may not be clearly understood for cases with incremental deployments (e.g. several <10kW facilities deployed over time).

Connection Cost Challenge

- Baseline connection costs* can be prohibitive for projects <30kW.
- System upgrade costs may impact viability, particularly when costly upgrades are triggered by incrementally small facilities.

* For the present discussion, baseline connection costs refers to standard process and infrastructure costs that are incurred for all projects, even when system upgrades are not required.

Uni-Directional EV Charger Connection Issues

Data

 Utilities do not have visibility on all EV deployments in a given area.

Connection Costs

- Utility-side costs required to enable panel upgrades (e.g. to 200 amps) needed for EV chargers may raise fairness and cost allocation issues, result in unnecessary transaction costs, and may be applied differently between utilities
- There may be opportunities to have EV energy management (e.g. load control) to avoid service upgrades.

Out-of-Scope Issues

 Several planning and operations issues were identified that are out of scope for the DER Connections Review, but the Technical Subgroup captured them for information.

Potential Areas of Exploration

Uni-Directional

- EV Connection Costs: Should panel upgrades to, say, 200 amps be considered part of the basic residential service paid for in rates (including the cost of any transformer upgrades that might be triggered)?
- EV Data: What steps can be taken to provide additional data on electric vehicle penetration to utilities, such as:
 - OEB working with ESA to facilitate Distributor access to ESA data on EV deployments.
 - OEB working with ministries to consider whether information sharing related to vehicle registrations can inform assessments of EV charger loads.
 - Distributors continuing to use smart meter data and artificial intelligence to determine EV deployments.

Bi-Directional

- Micro Threshold: The merits of adjusting the micro size threshold for DERs, above the existing 10 kW.
- Export Control: The merits of establishing a simplified CIA for projects up to 50 kW, to streamline their assessment for connection.
- Simplified CIA for Systems up to ~50 kW: The ways in which export controls may reduce the evaluated size for a connection application, to either eliminate or simplify CIA study requirements and costs.

Risk Framework Update

Presentation by Nishant Gehani (BBA), Larry Herod (Stem & Enel X), and Bob Braletic (Alectra)

Risk Framework Small Group – Key Takeaways

- Focused on Stage 1 objective of providing early indication of connection complexity.
- General agreement that potential applicants would benefit from connection-specific information, including likely technical requirements that would have a cost impact, subject to completion of an actual CIA.
- General agreement to use PCR as vehicle to communicate information.
- Associated guide expected to be prepared with additional information.

Information Expected to be in PCR

PCR proposed to qualitatively report on anticipated project cost/complexity, based on anticipated connection features:

- Generator size and type
- Thermal constraints
- Short circuit constraints
- Upgrades to feeder
- Upgrades to transformer
- Reconductoring of feeder

- Remote monitoring
- Metering upgrades
- Protection upgrades
- Transfer trip
- Requirement for SIA

PCR does not reflect definitive results, which would only be available after a CIA is performed.

Information Expected in Accompanying Guide

- Explanation of PCR-listed technical requirements.
- Brief background on purpose of technical requirement.
- Discussion of connection features that raise or mitigate risk that a technical requirement would be imposed.

Preliminary Consultation Information Request (Draft)

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OEB Te	emplate Version A J	
LDC 16	impiate version (By LUC)	
1. Inst	tructions	
Custor	mers are to obtain this workbook from their LDC's website, complete the worksheet "PCIF	*, and submit the editable MS Excel file to the LDC in accordance
with th	e instructions provided on the LDC website. All fields are required, unless otherwise note	d.
2 1		
2. LOC	Contact Information	
2.01	A I DC Name	Completed by / DC
	B. Department Name	Completed by LDC
	C. Department Address -	Completed by LDC
	D. Department City & Postal Code -	Completed by LDC.
	E. Department Fax -	Completed by LDC. Optional.
	F. Department Phone -	Completed by LDC.
	G. Department Email -	Completed by LDC.
3. Ger	neral	
3.01	Application Information	
	A. Project Name -	
	B. Application Submission Date Date	YYYY-MM-DD.
3.02	Applicant Information	
	A. Applicant (Company Name) -	-
	B. Applicant Type -	• · · · · · · · · · · · · · · · · · · ·
	C. Applicant Representative (Individual Name) -	-
	D. Applicant Address -	Corporate Address.
	E. Applicant City -	•
	F. Applicant Postal Code -	•
	G. Applicant Fax -	Optional
	H. Applicant Phone -	•
	I. Applicant Email -	-
4. Dec	ing the formation	
4. PTO	Preiest Nemenlate & Time	
4.01	A Proposed Canacity kill	
	B. Connection Type (Single/Three-Phase)	
	C. Inverter-Based/Non-Inverter Based -	
	D. Exporting/Non-Exporting	
	E. Islanding Capability -	Indicate if capable of islanding from arid.
4.03	Proposed DER Fuel/Energy Type	
	A. Solar -	
	B. Wind -	•
	C. Water (Hydroelectric) -	-
	D. Biofuel/Biogas -	
	E. Thermal -	Other than biofuel.
	F. Energy Storage -	
	G. Other Specify	Enter specific technology type.
		Continues.

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Distrit	outed Energy Resource (DER) Connection			davalann
Prelim	inary Consultation Information Request (PCIR)			uevelopii
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5 Site	Information			Flamework
5.01	Existing Account Holder			
	A. Existing Account Number (if Applicable)	-		and review
	B. Existing Account Holder Name (if Applicable)	-		
5.02	Site Information			Subgrou
	A. Site Address			Subgrou
	B. Site City/Town/Township			e e e
	C. Site Postal Code	-		formal nre
5.03	Existing DER at Site	-		ionnai pre
3.03	A. Existing DER Capacity (if Applicable)	kW		
	B. Existing DER Connection (Single/Three-Phase)	-		Workir
	C. Existing DER Type (Inverter/Non-Inverter)	-		
	D. Existing DER Intent (Exporting/Non-Exporting)	-		required it existing work instance
	B. If providing accompanying documents, please list	hem below.	Accompanying documents may	or may not inform the preliminary consultation.
7. LDC	C Office Use Only			
7.01	PCIR Status	Data		0
	A. Date Received	Date		Completed by LDC.
	C. Date Received & Deemed Complete	Date		Completed by LDC.
	E. Date Preliminary Consultation Report Issued	Date		Completed by LDC.
	F. Application ID Assigned	ID		Completed by LDC.

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Preliminary Consultation Report (Draft)

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. Disclaimer	Existing DER Connection (Single/Three-	xity (Based on Risk Fram	A LDCs are free to provide additional information not reported in the prescribed fields above		iun Group
he Local Distribution Company (LDC) is providing this info	Existing DER Type (Inverter/Non-Inverter In order to provide an earlier indication of the anticipa	ited complexity of a connect	switching, potential interconnection design suggestions, teleprotection and/or communication	nedia,	T
ssist you in completing your Connection Impact Assessme	Existing DER Intent (Exporting/Non-Expo	t or simplified criteria, and v		and review by	Technical
rocess does not consider the full range of technical evalua	full range of requirements set through the CIA proces	is. In some cases, LDCs m			
t this time. Capacity is only reserved upon completion of a equirements.	tion Overview requirement.			Cubaroup r	vriar ta
rigen errerer.	nsmitter Assets No. Item	Impact Preliminar	Х	Subgroup, p	
. Local Distribution Company (LDC) Contact Informatio	Fransmitter Name 6.01 Proposed DER Characteristics			0 1/1	
2.01 Contact Information	Transformer Station A. DER Size	-		formal procon	tation to
A. LDC Name	Feeder Designation B. DER Type (Inverter/Non-Inverter)	-		ionnai presen	
B. Department Name	Feeder Voltage C. DER Intent (Exporting/Non-Exporting)	-		•	
C. Department Address	st Distributor Assets (if Applicable) 6.02 Station Constraints			Working G	roun
D. Department City & Postal Code	Host Distributor Name (if Applicable) A. Thermal Constraints	Ex. High			TOUP.
E. Department Fax	Host Distributor Station (if Applicable) B. Short Circuit	Ex. High		-	-
F. Department Phone	Host Distributor Feeder (if Applicable) 6.03 Distribution System Infrastructure				
G. Department Email	Host Distributor Feeder Voltage (if Applic A. New Tap Line	High			
	C or Embedded Distributor Assets B. Voltage Regulator Upgrade	Medium			
. General Application Information	DC Distribution Station (if Different from	High			
3.01 Administration	DC Distribution Feeder (# Different from TS F) D. Site Distribution Transformer Opgrades	Medium			
A. Project ID	DC Distribution Feeder Voltage E. Reconductoring of Branch/Tap	Medium			
B. Project Name	Connection Information 6.04 Protection, Control, Metering, Telecom, Te	High			
C. Report Date	Site Dx Transformer Capacity A. Protection Opgrades	High			
3.02 Applicant Information	Connection Voltage B. Remote Monitoring	wedium			
A. Applicant (Company Name)	DC Asset ID (if Applicable)	LOW			
B. Applicant Representative Email	D. Hansler hip	nign			
3.02 Project Nameplate & Type	A Host Distributor CIA	Medium			
A. Proposed Capacity	the CIA consult LDC website for instru	Medium			
B. Connection Type (Single/Three-Phase)	C IESO System Impact Assessment	High			
C. Inverter-Based/Non-Inverter Based	icipated Impact Assessments Requir	riigii			
D. Exporting/Non-Exporting	A Optional	TBD			
E. Islanding Capability	LUC CIA B. Optional	TBD			
3.03 Proposed DER Fuel/Energy Type	Tost LUC CIA C. Optional	TBD			
A. Solar	6.07 LDC Overall Assessment of Connection Co	omplexity			
B. Wind	ESO System Impact Assessment				
C. Water (Hydroelectric)	A Anticipated Connection Complexity				
D. Biotuei/Biogas	·····,				
E. Thermal					
F. Energy Storage	7 Overall Accessment				
G. Other	7.01 Overall Assessment of Anticipated Canaci	tv			
3.04 Site Information	A LDCs articulate their initial assessment on	available canacity to conne			
A. Site Address					
C. Site Postal Code					
D. Site GPS Coordinates					
3.05 Existing DER at Site	7.02 Other Comments by LDC				
A Existing DER Canacity (if Applicable)					
D. Site GPS Coordinates 3.05 Existing DER at Site A. Existing DER Capacity (if Applicable)	7.02 Other Comments by LDC				

Preliminary Consultation Report (Draft)

... 6. Preliminary Assessment of Connection Complexity (Based on Risk Framework Criteria)

In order to provide an earlier indication of the anticipated complexity of a connection, LDCs provide an an initial assessment of likely connection requirements. These requirements are typically based on judgement or simplified criteria, and would be subject to change through the CIA process and through further consultation with upstream utilities, including host distributors and the transmitter. Further, this preliminary assessment does not evaluate the potential for the full range of requirements set through the CIA process. In some cases, LDCs may not have enough information to be able to provide an indication of a given requirement.

No.	Item	Impact	Preliminary Assessment	Comments			
6.01	01 Proposed DER Characteristics						
	A. DER Size	-		As provided by customer.			
	B. DER Type (Inverter/Non-Inverter)	-		As provided by customer.			
	C. DER Intent (Exporting/Non-Exporting)	-		As provided by customer.			
6.02	Station Constraints						
	A. Thermal Constraints	Ex. High					
	B. Short Circuit	Ex. High					
6.03	Distribution System Infrastructure						
	A. New Tap Line	High					
	B. Voltage Regulator Upgrade	Medium					
	C. Reconductoring of Existing Feeder Trunk	High					
	D. Site Distribution Transformer Upgrades	Medium					
	E. Reconductoring of Branch/Tap	Medium					
6.04	Protection, Control, Metering, Telecom, Teleprotection						
	A. Protection Upgrades	High					
	B. Remote Monitoring	Medium					
	C. Metering Upgrades	Low					
	D. Transfer Trip	High					
6.05	Additional Studies						
	A. Host Distributor CIA	Medium		May impose additional requirements.			
	B. Transmitter CIA	Medium		May impose additional requirements.			
	C. IESO System Impact Assessment	High		May impose additional requirements.			
6.06	LDC-Specific Criteria						
	A. Optional	TBD					
	B. Optional	TBD					
	C. Optional	TBD					
6.07	LDC Overall Assessment of Connection Complexity						
	A. Anticipated Connection Complexity			Preliminary assessment by LDC.			

Subject to further development by Risk Framework Small Group and review by Technical Subgroup, prior to formal presentation to Working Group.

Open Discussion

Meeting on 22 August 2022

Open Discussion

Seek industry feedback on:

• Areas of concern that have not been addressed.

Next Steps

- Subgroups continuing to advance additional recommendations.
- Next Working Group (October 4th) meeting will review balance of recommendations and allow for greater discussion on Working Group priorities.
- Subsequent Working Group meeting anticipated to close Tranche 4.

Backup

Meeting on 22 August 2022

Key Principles of Engagement for DER Connections

Industry Need

- Need ongoing engagement with industry to ensure issues remain relevant and address current and future trends
- Need to ensure level of consultation is in-line with industry expectations

Participation

- Working Group, with OEB staff facilitation, would have the following meetings:
 - Approx. bimonthly WG
 - Approx. monthly SG
 - Recurring or ad-hoc for others

Deliverables

- Seek industry proposals for solutions
- Industry to strive for consensus recommendations, with dissents noted if needed
- Use Working Group meeting summaries to document recommendations, with dissents noted if needed

Tranche 1: Letters to Distributors

 Informational guidance to distributors, mainly related to preliminary consultations and sample technical documents Tranche 2: DSC Amendments & DERCP

 DSC Amendments to codify recommendations from Tranche 1, establish DERCP, and standardize templates and forms. Tranche 3: Metrics, Estimates, Risk, EVs

- RRR Requirements
- Cost Estimates
- Risk Framework
- Bi-Directional EVs