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Distribution Energy Resources Connection Process

January 2, 2025

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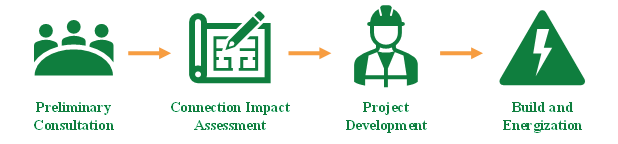
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# Overview

The following document defines the process for connecting Distributed Energy Resources (DERs) to the distribution system of Hearst Power Distribution Co. Ltd. (Hearst Power) as defined by the Ontario Energy Board’s (OEB’s) regulations and guidelines, including the Distribution System Code (DSC) and Distributed Energy Resource Connection Procedures (DERCP).

The DER connection process can be broken down into 4 main stages, as shown and explained below:



**Figure 1: DER Connection Process Stages**

* Preliminary Consultation: Planning, information exchange, capacity check
* Connection Impact Assessment: Capacity allocation and assessment of impact to distribution grid
* Project Development: Project scope finalization and connection cost agreement
* Build and Energization: Construction, inspections, commissioning and energization

*Special Note:*

*Proponents applying for a DER connection to Hearst Power’s distribution system are the sole responsibility of Hearst Power. Small, mid-sized and large generation projects may involve a host distributor, transmitter, or the Independent Electricity System Operator (IESO) throughout the application and connection process. Hearst Power will remain the sole primary contact between the applicant and all distribution or transmission companies. All applicants requiring contracts with the IESO for exporting energy to the distribution system are required to complete the process with the IESO directly.*

# Definitions

**Applicant**: The person or entity requesting to connect or information to connect a DER to Hearst Power’s distribution system.

**Connection Impact Assessment (CIA)**: The study performed by or on behalf of Hearst Power to assess the impact of a proposed DER connection on its system. The CIA will specify technical requirements for the connection.

**Distributed Energy Resource (DER)**: any electricity source or load that is connected to Hearst Power’s distribution system, typically through a connection on the customer-side of an ownership demarcation point. Sources generate electricity (e.g. generation facilities, including energy storage facilities when discharging), while loads do not generate electricity (e.g. energy storage facilities when charging).

**Distributor**: The relevant Local Distribution Company (LDC), to whose distribution system the DER is to be connected. **For the purposes of this document, Hearst Power and the term Distributor can be used interchangeably.**

*For other relevant definitions, including emergency backup generation facility, exporting connection, non-exporting connection, restricted feeder, and system power, refer to OEB’s Distribution System Code.*

# Generation Classification

Depending on the size of the project and its location within the distribution system, different studies by Hearst Power and/or the transmitter, and/or the IESO may be necessary to assess system impacts. The table below presents the different classification of DERs depending on their rating and the possible entities responsible for the studies.

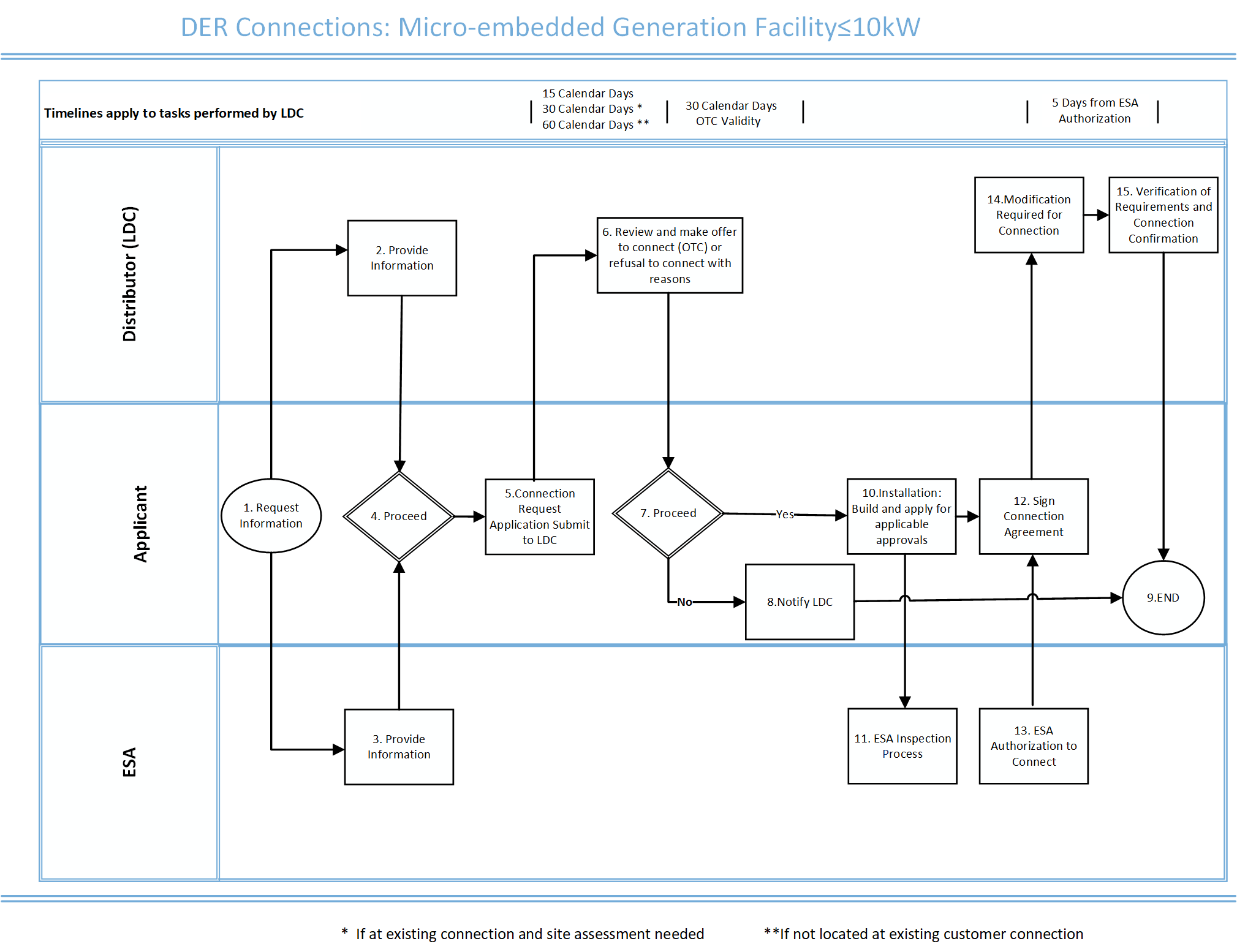
|  |  |  |
| --- | --- | --- |
| DER  Classification | Rating | Sample List of Studies |
| Micro | ≤ 10kW | None |
| Small | 1. ≤ 500 kW connected on distribution system voltage < 15kV, or 2. ≤ 1 MW connected on distribution system voltage >= 15kV | 1. Hearst Power1 CIA 2. Hydro One1 CIA (if Applicable) |
| Mid-Sized | 1. ≤ 10 MW but > 500 kW connected on distribution system voltage < 15kV, or 2. > 1 MW but ≤ 10MW connected on distribution system voltage ≥ 15kV | 1. Hearst Power1 CIA 2. Hydro One1 CIA (if Applicable) 3. Hydro One Transmission Impact Study (if applicable) |
| Large | **>10MW** | 1. Hearst Power1 CIA 2. Hydro One1 CIA (if Applicable) 3. Hydro One Transmission Impact Study 4. IESO System Impact Assessment |
| 1 Hearst Power is the Distributor, and Hydro One is the Host Distributor | | |

**Table 1: DER Connection Classifications**

# Processes

The following sections describe the process steps that will be followed per the OEB’s Distributed Energy Resources Connection Procedures (DERCP), for each DER classification, along with the steps for the agreements as well as the build and energization stage.

## Micro-embedded Generation Facility

Micro-embedded generation facilities are equal to or less than 10 kW and are considered to pose a relatively low connection risk to the distribution system compared to larger generation facilities. The process flowchart from OEB’s DERCP outlines the timelines that apply to tasks which are to be performed by the distributor, and responsibilities for stakeholders involved in the connection of a Micro-embedded Generation Facility

**Figure 2: Process Flowchart for DER Connection of Micro-embedded Generation Facility (≤ 10kW)**

*(Source: Distributed Energy Resources Connection Procedures Version 1.0, Figure 2)*

The distributor (in accordance with Section 6.2.6 of the DSC) and applicant are expected to follow the process steps outlined below.

* **Step 1:** The applicant proposing the installation of a micro-embedded generation facility with a non-exporting connection, contacts the distributor and the Electrical Safety Authority (ESA) to gather connection and process information.
* **Step 2:** The distributor makes the information available to the applicant in a timely manner. The information package will include the description of the connection process approvals needed by the distributor for connection; technical requirements including metering; contractual requirements (Micro-embedded Generation Facility Connection Agreement); and application forms.
* **Step 3:** ESA provides information on Electrical Safety Requirements.
* **Step 4:** The applicant reviews relevant information from the distributor and the ESA on the project, and prepares:
  + an installation plan, including the size/type of generation facility (i.e., load displacement/net metering/isolated from distribution system/grid connection); and
  + a project plan.
* **Step 5:** The applicant submits application to the distributor to review.
* **Step 6:** The distributor makes an Offer to Connect or provides its refusal to connect with reasons within 15 calendar days. The distributor’s review of an Application submitted for the connection of a micro-embedded generation facility at the existing customer connection will include:
  + typical requirement for new meter only;
  + check for service upgrade requirement;
  + check for significant amount of other generation on feeder;
  + response to the applicant with an offer to connect or refusal
  + response to applicant with requirements specific to the connection (typically requirements for metering) and costs, timing to implement, etc.
* **Step 7:** The applicant decides whether to proceed with the connection process.
* **Step 8:** The applicant notifies the distributor that it has decided not to proceed with the connection application.
* **Step 9:** The applicant ends the process.
* **Step 10:** The applicant must indicate its intention to connect within the 30-day validity period of the offer to connect. The applicant must work closely with the distributor, the ESA and any other organizations from which work, inspections, approvals, or licenses are required to prevent delays. The activities will be planned in coordination with project milestones, and it is up to the applicant to initiate actions at the required times.
* **Step 11:** Where required by the ESA, the applicant must file a notification to receive an ESA Authorization to Connect.
* **Step 12:** The applicant reviews and signs the Connection Agreement.
* **Step 13:** ESA provides a Connection Authorization when the installation meets all the applicable requirements of the Ontario Electrical Safety Code as determined by ESA.
* **Step 14:** The distributor completes any work required to facilitate the connection to the distribution system.
* **Step 15:** The distributor works with the applicant to complete the connection including any testing and verification requirements.

For an existing customer connection where a **site assessment is not required**, the distributor will make an offer to connect within 15 days of receiving a completed application or provide reasons for refusing to connect. The distributor will not charge to prepare the offer to connect in this case.

For new projects where a **site assessment is required**, the distributor will make the offer to connect within 60 days of receiving a completed application or provide reasons for its refusal. If a site assessment is needed, the distributor may charge a $500 connection deposit for preparing the offer to connect, which shall be payable in the form of cash, cheque, electronic funds transfer, letter of credit from a bank, or surety bond. If the distributor refuses the connection after a site visit, it will return the deposit within 30 days. If the DER applicant does not accept the offer or withdraws its application, the distributor will keep the deposit.

In **all cases**, the offer will be open for 30 days after it is provided, after which it may be revoked by the distributor.

If actual connection costs are less than the deposit, the distributor will refund the difference when the connection is completed and in service. Interest shall accrue monthly on connection deposits made by way of cash or cash equivalents commencing on receipt of the total deposit required by the distributor. The interest rate shall be at the Prime Business Rate as published on the Bank of Canada website less 2 percent, updated quarterly. Refunds, in whole or part, of deposits made in cash or cash equivalents will include interest on the refunded amount from the date of receipt.

A DER applicant must notify the distributor that it has satisfied all applicable service conditions and received all necessary approvals including confirmation of issuance of the authorization to connect from the ESA.

The applicant must enter into a Connection Agreement and pay the required connection costs, including costs for any necessary new or modified metering.

Once these conditions have been satisfied, the distributor shall connect the DER applicant’s micro-embedded generation facility to its distribution system within 5 business days, or at such later date as agreed to by the DER applicant and the distributor.

## Small, Mid-Sized, and Large Embedded Generation Facility Projects

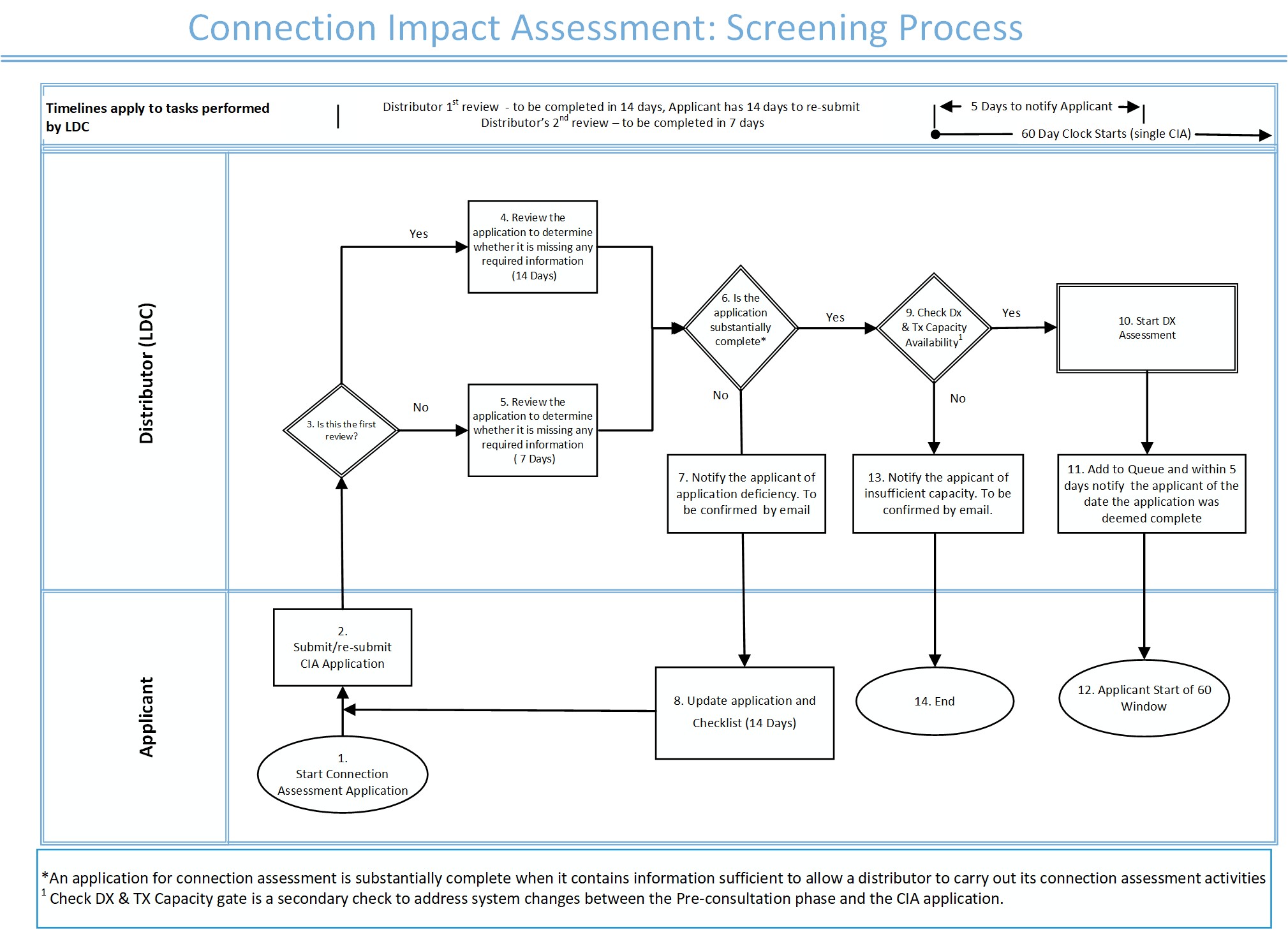
The processes for small, mid-sized, and large embedded generation facilities are similar with the difference primarily being the number of impact assessments that may be applicable. Unlike the micro-embedded generation facility process, the connection process for small, mid-sized, and large embedded generation facilities includes a common screening process on application intake.

### Screening Process for Small, Mid-sized, and Large Embedded Generation Facility Projects

CIA applications are subject to a screening process. The screening process is intended to provide feedback to the applicant early in the process on any deficiencies in their submission that would prevent a distributor from proceeding with a review. Upon submission of an application, the distributor confirms if the application is substantially complete. A substantially complete application is a submission in which there is sufficient information provided for the distributor to process the application and complete the CIA, included a completed Form B, a single line diagram of the connection and the associated protection philosophy. In order to facilitate timely processing of applications, payment for the applicable studies should be included with the submission when possible.

If the application is incomplete, the distributor will return the incomplete part of the application package to the applicant with a deficiency notification identifying the errors and omissions in the application. Upon receipt of a deficiency notification, an applicant should review and correct the application and resubmit the revised application within 14 days. If the application is not returned in 14 days, the application may lose its position in the processing queue.

Upon receipt of a revised CIA application, the distributor must review the application within 7 days to determine if there is sufficient information for the distributor to process the application. If there is sufficient information, the submission is deemed substantially complete, and the distributor will reconfirm that the distribution and transmission capacity that was available at the preliminary consultation stage is still available. Please note that capacity is not reserved until the CIA is completed. If capacity is available, the application is added to the processing queue and the distributor will proceed with a CIA. This begins the 60-day window for the distributor to return the completed CIA to the DER applicant.

The process flowchart for determining the status of an application using the screening process is shown in the figure below.

**Figure 3: Process Flowchart for Screening of Small, Medium and Larger DER Connection Applications**

*(Source: Distributed Energy Resources Connection Procedures Version 1.0, Figure 3)*

The corresponding procedure steps for the distributor and applicant to follow are outlined below the flowchart.

* **Step** **1:** The applicant initiates the CIA Application and gathers the current application form and Distributor’s application requirements.
* **Step 2:** The applicant submits the completed CIA Application package, including completed application form, payment for required studies, attachments, and application checklist.
* **Step 3:** The distributor determines if this is the initial submission or a revised application submission.
* **Step 4:** For initial submissions, the Distributor reviews the application for completeness within 14 calendar days.
* **Step 5:** For revised application submissions, the Distributor reviews the application for completeness within 7 calendar days.
* **Step 6:** For the completeness check outlined in Steps 4 and 5 above, the distributor will review the application to determine if there is sufficient information provided by the applicant to process the submission. Once the distributor determines that the submission provides the necessary information to commence a CIA study, the application is deemed substantially completed.
* **Step 7:** For submissions that are not substantially complete, the distributor will notify the applicant of the application deficiencies via email or letter if the applicant’s email is not provided. The deficiency notification shall identify any errors and omissions in the application that would prevent the distributor from proceeding with the CIA. The notification shall outline the available remedies required to have the application deemed substantially complete.
* **Step 8:** On receipt of a deficiency notification, an applicant should review and revise the application to address the deficiencies and resubmit the application. The process allows 14 days for the applicant to resubmit a revised application. If the applicant does not return the revised application within 14 days, the distributor may remove the application from the processing queue. If the application is removed from the queue, it may be treated as a new application once it is resubmitted.
* **Step 9:** For submissions that are deemed substantially complete, the distributor will reconfirm transmission and distribution capacity availability. This is a secondary check to address the possibility of system changes between the Preliminary Consultation phase and the CIA application.
* **Step 10:** If capacity is confirmed to be available, the distributor proceeds with the assessment.
* **Step 11:** The distributor will add the application to the processing queue in the order in which they are deemed substantially complete and within 5 days notify the applicant of the date the application was deemed substantially complete.
* **Step 12:** The date the submission is deemed substantially complete starts the timed-day window for the distributor to send the completed connection impact assessment to the applicant and proceed with the connection agreement.
* **Step 13:** If available capacity is not confirmed, the distributor will notify the applicant via email that capacity is not available to support the connection
* **Step 14:** If there is no capacity available, the process concludes.

The screening process ends when the application is deemed to be substantially complete. i.e., there is enough information to begin processing the CIA.

### Small Embedded Generation Facility

A screenshot of a diagram

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**Figure 4: Process Flowchart for DER Connection of Small Embedded Generation Facility**

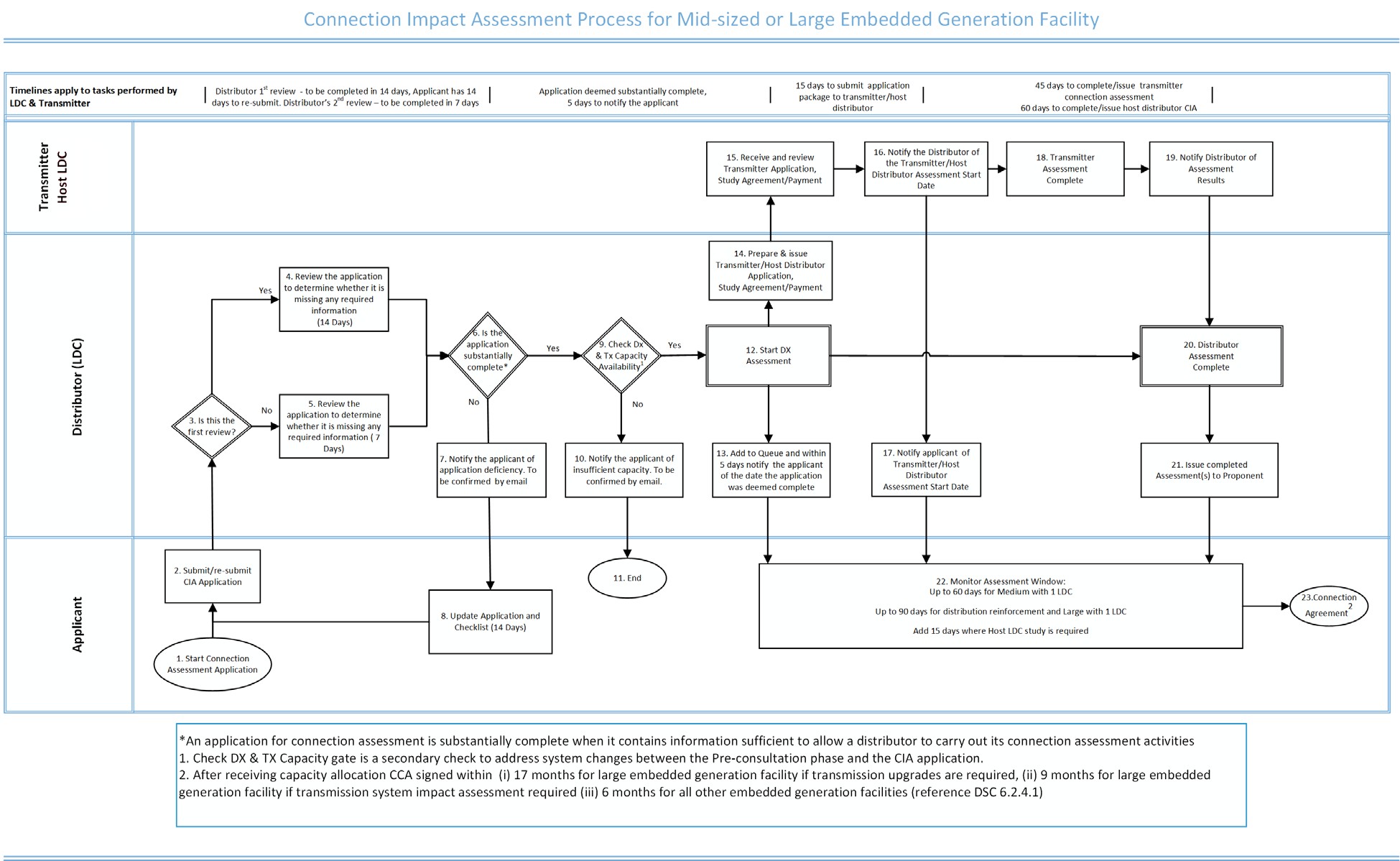
*(Source: Distributed Energy Resources Connection Procedures Version 1.0, Figure 4)*

The corresponding procedure steps for the distributor and applicant are outlined below:

* **Step 1:** The applicant initiates the CIA process and gathers the current CIA application form and distributor’s application requirements from the distributor.
* **Step 2:** The applicant submits the completed CIA Application package, including completed application form, payment for required studies, attachments, and application checklist.
* **Step 3:** The distributor determines if this is the initial submission or a revised application submission.
* **Step 4:** For initial submissions, the distributor reviews the application for completeness within 14 calendar days.
* **Step 5:** For revised application submissions, the distributor reviews the application for completeness within 7 calendar days.
* **Step 6:** For the completeness check outlined in steps 4 and 5 above, the distributor will review the application to determine if there is sufficient information provided by the applicant to process the submission. Once the distributor determines that the submission provides the necessary information to commence a CIA study, the application is deemed substantially completed.
* **Step 7:** For submissions that are not substantially complete, the distributor will notify the applicant of the application deficiencies via email or letter if the applicant’s email is not provided. The deficiency notification shall identify any errors and omissions in the application that would prevent the distributor from proceeding with the CIA. The notification shall outline the available remedies required to have the application deemed substantially complete.
* **Step 8:** On receipt of a deficiency notification, the applicant should review and revise the application to address the deficiencies and resubmit the application. The process allows 14 days for the applicant to resubmit a revised application. If the applicant does not return the revised application within 14 days, the distributor may remove the application from the processing queue. If the application is removed from the queue, it may be treated as a new application once it is resubmitted.
* **Step 9:** For submissions that are deemed substantially complete, the distributor will reconfirm transmission and distribution capacity availability. This is a secondary check to address the possibility of system changes between the Preliminary Consultation phase and the CIA application.
* **Step 10:** The distributor will notify the DER applicant via email if there is no capacity available to support the connection.
* **Step 11:** If there is no capacity available, the process concludes.
* **Step 12:** If capacity is confirmed to be available, the distributor proceeds with the assessment.
* **Step 13:** The distributor will add applications to the processing queue in the order in which they are deemed substantially complete and within 5 days will notify the DER applicant of the date the application was deemed substantially complete.
* **Step 14:** The date the submission is deemed substantially complete starts the 60-day or 90- day window set out in Step 16, below.
* **Step 15:** The distributor or host distributor completes the CIA.
* **Step 16:** The distributor will provide with its CIA assessment a detailed cost estimate of the proposed connection and an offer to connect within:
  + 60 days of the receipt of the substantially complete application where no distribution system reinforcement or expansion is required; or
  + 90 days of the receipt of the substantially complete application where a distribution system reinforcement or expansion is required
* **Step 17:** The process moves onto the connection agreement phase.

### Mid-sized / Large Embedded Generation Facility

Mid-sized and Large embedded generation facilities as classified in Table 1, are also subject to the screening process. Once they are deemed substantially complete, they will be assessed. The CIA process for the connecting distributor is essentially the same as for the small projects. If the connecting distributor is embedded in a host distributor, Mid-sized and Large embedded generation facilities must also have an assessment from the host distributor and a study from the upstream transmitter to assess the impact on the transmitter’s system. Large projects also require a System Impact Study from the IESO to assess their impact on the IESO-administered grid. The flowchart in Figure 5 below shows the responsibilities of the various stakeholders and the expected task completion timeline. The distributor has responsibility for providing information to the upstream reviewers to ensure that the reviews occur as near to concurrently as is possible. In any case, the distributor is responsible for finishing its review within 60 days of the application being substantially complete for mid-sized embedded generation facilities and within 90 days of the application being substantially complete for large embedded generation facilities. Where a host distributor CIA is also required, these timelines will be increased by a further 15 days.

**Figure 5: Process Flowchart for DER Connection of Mid-Sized and Large Embedded Generation Facility**

*(Source: Distributed Energy Resources Connection Procedures Version 1.0, Figure 5)*

The corresponding procedure steps for the distributor and applicant are outlined below:

* **Step 1:** The applicant initiates the CIA process and gathers the current CIA application form and distributor’s application requirements from the distributor.
* **Step 2:** The applicant submits the completed CIA Application package, including completed application form, payment for required studies, attachments, and application checklist.
* **Step 3:** The distributor determines if this is the first submission or a revised application submission.
* **Step 4:** For initial submissions, the distributor reviews the application for completeness within 14 calendar days.
* **Step 5:** For revised application submissions, the distributor reviews the application for completeness within 7 calendar days.
* **Step 6:** For the completeness check outlined in Steps 4 and Steps 5 above, the distributor will review the application to determine if there is sufficient information provided by the applicant to process the submission. Once the distributor determines that the submission provides the necessary information to commence a CIA study, the application is deemed substantially completed.
* **Step 7:** For submissions that are not substantially complete, the distributor will notify the applicant of the application deficiencies via email or letter if the applicant’s email is not provided. The deficiency notification shall identify any errors and omissions in the application that would prevent the distributor from proceeding with the CIA. The notification shall outline the available remedies required to have the application deemed substantially complete.
* **Step 8:** On receipt of a deficiency notification, the applicant should review and revise the application to address the deficiencies and resubmit the application. The process allows 14 days for the applicant to resubmit a revised application. If the applicant does not return the revised application within 14 days, the distributor may remove the application from the processing queue. If the application is removed from the queue, it may be treated as a new application once it is resubmitted.
* **Step 9:** For submissions that are deemed substantially complete, the distributor reconfirms6 transmission and distribution capacity availability. Capacity is not reserved for the project until the CIA has been completed. This is a secondary check to address the possibility of system changes between the Preliminary Consultation phase and the CIA application.
* **Step 10:** The distributor notifies the applicant via email if there is no capacity availability to support the connection.
* **Step 11:** If there is no capacity available, the process concludes.
* **Step 12:** If capacity is confirmed to be available, the distributor proceeds with the assessment.
* **Step 13:** The distributor adds the application to the processing queue and within 5 days notifies the DER applicant of the date the application was deemed substantially complete. The date the submission is deemed substantially complete starts the timed window for the distributor to return the completed CIA.
* **Step 14:** The distributor prepares and issues an application to the transmitter for a CIA, a Study Agreement, and payment within 15 days of starting the assessment.
* **Step 15:** The transmitter receives the application from the distributor along with the Study Agreement and payment. The Transmitter has 15 days to review the submission and notify the distributor.
* **Step 16:** The transmitter notifies the distributor of the Transmitter Assessment start date.
* **Step 17:** Distributor notifies the applicant of the Transmitter Assessment start date.
* **Step 18:** The transmitter executes and completes the assessment within 45 days. Where possible the transmitter completes this study concurrently with the distributor Assessment.
* **Step 19:** The transmitter notifies the distributor on the results of the assessment.
* **Step 20:** The distributor or host distributor also completes its CIA.
* **Step 21:** The distributor will provide the completed CIA to the applicant within:
  + 60 days of the receipt of the substantially complete application in the case of a proposal to connect a mid-sized DER; and
  + 90 days of the receipt of the substantially complete application in the case of a large DER.

The applicant can use the assessment start date notification to monitor the distributor’s and transmitter’s assessment progress against the applicable 60-day or 90-day assessment window. The assessment period is increased by 15 days where a host distributor assessment is also required.

* **Step 22:** The process moves on to the connection agreement phase.

## Agreements

Once the distributor and transmitter or host distributor have completed their respective CIAs, the process moves to the connection agreement phase. There are two primary agreements that are to be signed:

**Connection Agreement:** an agreement between the distributor and applicant that contains specific terms and conditions relating to connection and access to the distributor’s distribution system.

**Connection Cost Agreement (CCA):** This agreement sets out the scope of work and the associated cost the distributor will seek to recover from the Applicant to connect the project to the distribution system. If the connection impacts a host distributor and/or the transmission system, the host distributor will also require a CIA and CCA and the transmitter will require a transmitter study and its equivalent to a CCA in response to the proposed DER project. The transmitter equivalent to a CCA is a Transmitter Capital Cost Recovery Agreement (CCRA). Where there is a CCRA the distributor will include the costs of any transmission work in its CCA as it is the responsibility of the distributor to contract for and pay the transmitter then collect from the customer. The process flowchart in the figure below outlines the interaction between the applicant, distributor, and host A diagram of a flowchart

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**Figure 6: Flowchart Outlining Interactions Between Parties (Multiple Connection Agreements)**

*(Source: Distributed Energy Resources Connection Procedures Version 1.0, Figure 6)*

The process steps for the scenario outlined in Figure 6 above are provided below:

* **Steps 1-3:** The process starts with the applicant reviewing the completed CIA (s) from the distributor, the host distributor and if applicable, the transmitter.
* **Step 4:** The applicant decides whether to cancel or proceed with the connection of the project.
* **Step 5:** The applicant notifies the distributor in the case of a decision not to proceed with the project.
* **Step 6:** The distributor notifies the host distributor/transmitter that the applicant is not proceeding with the project. The distributor removes the project from the application processing queue and the process concludes for the distributor.
* **Step 7:** The host distributor/transmitter removes the project from the application processing queue and the process concludes for the host distributor/transmitter.
* **Step 8:** The applicant should discuss with the distributor any concerns, questions and/or proposed adjustments that need to be agreed upon before the Connection Assessments expiration date(s). An extension may be granted by distributor if deemed necessary.
* **Step 9:** The applicant must notify the distributor of its intent to proceed with the Project.
* **Step 10:** The distributor prepares the Capital Cost Agreement (CCA) and submits a Transmitter Capital Cost Recovery Agreement (CCRA) Application to the transmitter.
* **Step 11:** The transmitter prepares the CCRA within 45 days.
* **Step 12:** The transmitter issues this CCRA to the distributor.
* **Step 13:** The distributor reviews the CCRA and issues the distributor’s CCA to the applicant.
* **Step 14:** The applicant is expected to review the CCA and seek any clarification from the distributor if required.
* **Step 15:** If the applicant agrees with the terms of the CCA, the applicant sign and issues payment to the distributor.
* **Step 16:** The distributor acknowledges receipt of the CCA, assigns a Project Manager within 45 days, issues payment to the transmitter, and executes the CCRA and any other required agreements.
* **Step 17:** The distributor shall review the detailed design within 1 month of signing the CCA.
* **Step 18:** The transmitter acknowledges receipt of the CCRA and assigns a project manager within 45 days.
* **Step 19:** The process moves onto the build phase after assignment of the Project Manager for the distributor and transmitter.

*Special Note:*

***Option to Request a More Detailed Cost Estimate:*** *As noted earlier, the outcome of a CIA includes the technical requirements of the connection; and an estimate of costs. The cost estimate at the CIA stage is usually based on typical pricing and the distributor will indicate the anticipated level of uncertainty for the estimate. An applicant for a mid-sized or large generation facility may request a detailed cost estimate, at the applicant’s expense. The applicant has the option of paying for the detailed cost estimate which would be intended to reduce the level of uncertainty to a lower amount before deciding on the project and before signing a connection cost agreement.*

## Build and Energization Process

After the CCA is executed and the construction drawings are finalized, the applicant can proceed to construction. A kick-off meeting is scheduled with an assigned project manager within 45 days of the CCA being signed. The Build and Energization process flowchart shown in the figure 7, and the corresponding process steps for the distributor, transmitter and Applicant are mentioned below:

* **Step 1:** The distributor assigns a project manager who will coordinate a project kick-off meeting with the applicant and the host distributor/transmitter.
* **Step 2:** The distributor’s Project Manager will complete a project kick off meeting with all parties involved to discuss facility design, SLD, protections and controls, cost estimates and the project schedule including target in-service date.
* **Step 3:** Applicant is to provide project design details including single line diagrams (SLDs) and the proposed project schedule including targeted in-service date.
* **Step 4:** The DER Applicant must provide information to the ESA for the Plan Review process.
* **Step 5:** ESA reviews the Plan and provides feedback.
* **Step 6:** The Applicant shall, at transmitter’s and distributor’s request, provide a summary of testing results, including any certificates of inspection or other applicable authorizations or approvals certifying that any of the applicant’s new, modified or replacement facilities have passed the relevant tests and comply with all applicable instruments and CSA C22.3 No 9.
* **Step 7:** The Applicant begins construction of the project.
* **Step 8:** The Applicant submits the Commissioning Plan to the distributor and the transmitter via the distributor.
* **Step 9:** The distributor completes any additional work required.
* **Step 10:** The transmitter completes any additional work required.
* **Step 11:** The applicant files a notification with ESA.
* **Step 12:** The Applicant finalizes the terms of the Connection Agreement with the distributor and signs the agreement.
* **Step 13:** The distributor finalizes the terms of the Connection Agreement with host distributor/transmitter if required and signs the agreement(s).
* **Step 14:** The host distributor/transmitter finalizes the terms of the Connection Agreement with the distributor and signs the agreement(s).
* **Step 15:** The applicant proceeds with commissioning and testing of the generation facility.
* **Step 16:** The ESA inspections through the construction process up to and including the issuance of an Authorization to Connect. ESA may issue a temporary Authorization to Connect according to its own processes.
* **Step 17:** The distributor witnesses and verifies the applicant’s commissioning process related to the connection facilities.
* **Step 18:** The distributor (and transmitter where and when applicable) will grant the applicant permission to operator once all the distributor connection requirements have been satisfied and ESA Authorization to Connect have been received by the distributor.
* A diagram of a flowchart

  Description automatically generated**Step 19:** The connection process concludes when the DER is fully connected and operational.

**Figure 7: Process Flowchart for Build Process**

*(Source: Distributed Energy Resources Connection Procedures Version 1.0, Figure 7)*

# Appendix A: Sample Protection Philosophy

Below is a summary of a sample protection philosophy for non-exporting, inverter-based (NE/I) connections including storage, solar, and wind. It is intended to be used as a guide for applicants regarding the kinds of protections, and particularly the categories of protections, that Hearst Power may require for connection.

This is one example of a protection philosophy that would meet the requirements for a complete protection philosophy for the purpose of a CIA application. Other philosophies may also meet the standards. It provides guidance to a DER proponent on good utility practice as it relates to protection requirements of non-exporting, inverter-based (NE/I) DERs. To form a protection scheme, all the elements for each category within any given protection philosophy are requirements.

This document is not an approval for connection. This information should help applicants file better and more complete applications for connection. An applicant will need to submit detailed protection settings after the utility has completed the impact assessment of the submitted connection application.

The standards and certification testing referenced in this document should be read as referring to the current versions of these standards at time of reading.

## Sample Protection Philosophy for Non-exporting Inverter-based Sources

Project Name: Project ID#: Project Type: Capacity:

Connection feeder (optional):

In compliance with the technical interconnection requirements of the local distribution company for which this project will interconnect ,the protection system of the connection will be designed to:

* Detect internal faults with the generator facility, downstream of the Point of Common Coupling (PCC), and automatically disconnect the NE/I source
* Detect external faults on the utility feeder and automatically disconnect the NE/I source
* Detect islanding conditions and disconnect the NE/I source
* Detect export of power from the NE/I source to the utility feeder and automatically disconnect the NE/I source

### Internal Faults Within the Generator Facility

The following protections are in place to protect against internal faults resulting from the NE/I source:

* Multi-Function Relay-At the PCC, a multi-function relay will be installed to monitor internal faults resulting from the NE/I source. The 52 Trip Breaker will trip if it detects the following:
* 25 - Synchronization Check
* 27 - Undervoltage
* 59 - Overvoltage
* 81O/U - Under and Over Frequency
* ID -Active Anti-Islanding
* Inverter Breakers - Each inverter is equipped with an AC breaker at the output of the inverter providing additional overcurrent protection
* Facility Overcurrent Protection - All circuits within the facility are protected from both phase-to-phase and phase-to-ground faults by appropriate overcurrent protection devices. Fuses are sized to clear under fault conditions within the generator facility

### External Phase and Ground Faults in the Distribution System

The following protections are in place to protect against external faults resulting from the utility feeder:

* Multi-Function Relay - At the main utility service, prior to the first facility load, a multi-function relay will be installed to monitor faults from the utility feeder. The 52 Trip Breaker at the NE/I source PCC will trip under the following faults: • 27 - Undervoltage
* 32R- Reverse Power
* 50/51- Overcurrent
* 59 - Overvoltage
* 81O/U - Under and Over Frequency
* 67 - Directional

### Inverter Protection

* The inverters proposed for this project are certified to UL 1741, IEEE 1547, CSA C22.2 107.1-01 standards10 and will behave accordingly.

### Anti-Islanding

* The Energy Resource Facility will operate in a grid following mode and will not operate islanded.
* Anti-Islanding Inverters -The NE/I source inverters contain both passive and active antiislanding protection as required by IEEE 1547 and UL1741 SA. If the utility normal power supply is interrupted, the inverters detect the loss of power and disconnect.

### Reverse Power

* Reverse Power Protection - In addition to the multi-function relay at the utility supply monitoring reverse power (32R), the load is continually monitored to ensure the NE/I source discharge is below the consumption of the facility. This additionally protects against power injection to the utility grid.

### Directional Overcurrent

* Directional overcurrent protection - Directional overcurrent relays are normally used on incoming line circuit breakers on buses which have two or more sources. They are connected to trip an incoming line breaker for fault current flow back into the source, so that a fault on one source is not fed by the other sources.

### Special Comment Regarding Inverter Based Generation

The inverters specified for this project have a limited fault current contribution, because inverters are current-limited devices, unlike rotating generators, the fault current is very close to the maximum output current, limiting the fault current in the system to 120% -140% of FLA.

### Breaker Failure Scheme (Facilities with an aggregate output > 500kW)

In the event that 52-A fails to open when intertie protection relay calls for a trip, 52-B will instantaneously trip and lock out.

### Reconnection

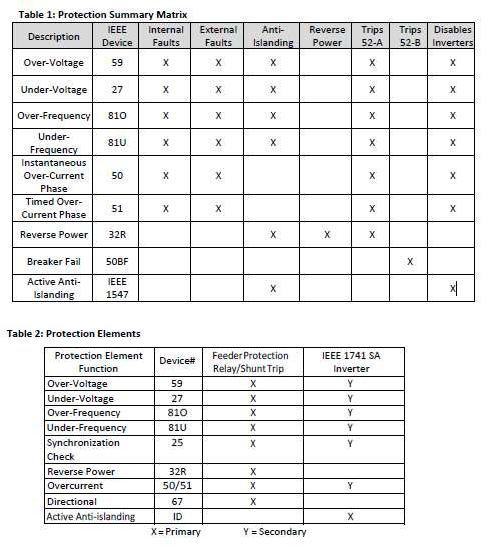
* **Manual reconnection:** There is no automatic reconnection scheme at this facility. A manual reconnection will only be executed when given permission by the respective controlling authority, **OR**
* **Automatic reconnection scheme:** Intertie protection relay will initiate automatic reconnection of DER only after a fault event has occurred on the utility feeder and not after a fault event within the DER facility. Stable voltage and frequency measurement within ranges and for time period stipulated in the technical interconnection requirements will be met prior to automatic reconnection. Internal faults will be distinguished from external faults by pickup of directional overcurrent 67/67N protection element looking into DER facility. This will ensure reconnection into facility fault is prohibited by blocking of automatic reconnection scheme for facility faults.

### Open Phase Protection

* This project consists of multiple 1-phase inverters connecting to a 3-phase service or multiple 3-phase inverters connecting to a 3-phase service; therefore, open phase protection will be provided by 46 and/or 47 element(s) in the intertie protection relay to ensure the BESS maintains a balanced 3-phase output and detects loss of voltage in one or more phases and will trip the entire generating facility upon detection of such, **OR**
* Attached is a signed letter from the inverter manufacturer stating that a facility comprising of multiple inverters is capable of maintaining a balanced 3-phase output and will detect loss of voltage in one or more phases and will trip the entire generating facility upon detection of such.

### Communications and Transfer Trip/DGEO (if applicable)

### Summarize communication systems and transfer trip/DGEO timing (if applicable).



# Appendix B: Technical Interconnection Requirements

Hearst Power’s technical requirements to connect are consistent with Hydro One’s Technical Interconnection Requirements and can be found at: <https://www.hydroone.com/business-services/generators/technical-requirements>