

# DISTRIBUTED ENERGY RESOURCE INTERCONNECTION PROCESS REQUIREMENTS FOR DISTRIBUTED GENERATION AND LARGE MICRO-GENERATION

---

FortisAlberta's Distributed Energy Resource (DER) Process explains what is required from the customer to complete a generator interconnection. DER projects include Distributed Generation (DG) and large Micro-Generation (MG) over 150 kW.

## PHASE 1: Pre-Application Scoping

Customers may submit an application for a Pre-Application Scoping Request to FortisAlberta to learn where the closest distribution lines are to a project and if it's feasible to connect a project to the grid at that location. The fee for a pre-application scoping request is \$500 to review up to five project locations and \$250 for each additional location.

This is an optional step in the interconnection process however, it is recommended to help new customers understand the overall process, who is involved and most importantly, where to find a location to successfully connect a project.

### Before the Application

- DER Customer reviews "Get Connected: Distributed Generation" or "Get Connected: Micro-Generation" and the Frequently Asked Questions (FAQs) located at [fortisalberta.com](http://fortisalberta.com).
- DER Customer consults with FortisAlberta about any additional questions
- DER Customer completes and submits the "Distributed Generation Service Application" or "Micro-Generation Service Application" on [fortisalberta.com](http://fortisalberta.com).
  - Minimum requirements include the legal land location(s) for the interconnection point (GPS coordinates are acceptable), amount of generation being requested, type of generation (inverter, synchronous, induction)

## PHASE 2: High Level Study Stage

### Application and Payment

- FortisAlberta assigns a Key Account Manager who will review the application to ensure it is complete and may contact the Customer for clarification of the study scope to be undertaken.
- FortisAlberta accepts the application, creates the project number and provides that reference number to the DER Customer along with an invoice for the High Level Study (HLS) fee. FortisAlberta's HLS fees start at \$4,000 per feeder being assessed.

- Once FortisAlberta receives payment for the HLS, the DER Customer project enters the queue. If the invoice is not paid by the due date of 30 calendar days, the invoice and the project are cancelled.

## System Capacity Study

- The Project is sent to Distribution Planning for system capacity review.
- The FortisAlberta Distribution Planner completes the study for the DER Customer project and the generator is assigned to the best available feeder capable of accommodating the proposed generation. This secures the capacity to the feeder at the originating substation.
- FortisAlberta sends the HLS proposal to the DER customer for review (valid for 30 calendar days).
  - FortisAlberta will provide multiple options depending on queuing, for example, if there is a project contingent on the same capacity at the feeder or substation, this information will be provided to the customer in the HLS to allow additional discussion around future options or contingencies.
  - The HLS includes the distribution ballpark cost estimate and the anticipated Transmission Facility Owner (TFO) and Alberta Electric System Operator (AESO) upgrade requirements (without costs).
- FortisAlberta must receive the DER Customer's signed HLS acceptance letter for the location and/or option specified in the HLS within 30 calendar days or the project is cancelled and removed from the queue.
- FortisAlberta sends invoices for the full Distribution and Transmission Detail Study costs required for the project to advance. The available capacity is secured for a further 30 calendar days from the date of invoice.
  - FortisAlberta's Detailed Distribution Study fee is \$10,000 for projects that do not require the AESO connection process and \$20,000 for projects that require the AESO Behind the Fence connection process.
  - TFO Study Protection and Power flow Studies as required.
    - Note:** If multiple TFOs are involved, additional fees will be required as each has their own fees
- FortisAlberta will advance the project to the Detail Study Stage upon full payment of all required Detail Study costs.
- If payment is not received by the invoice due date, the project will be removed from the queue.

## PHASE 3: Detailed Distribution Study

FortisAlberta continues to hold the capacity for the DER Customer's defined project scope as specified in the accepted HLS. Any change to the HLS scope (generator size, location, type, etc.)

may result in a new HLS being required or a new project to be initiated by the DER Customer (Phase 1). This decision is determined by the Distribution Planner and Key Account Manager.

The DER Customer must provide the following technical information:

- Single Line Diagram (SLD) showing;
  - Type of generator (synchronous, induction, inverter)
  - Prime Mover (gas, wind, solar, biomass, other)
  - Number and nominal capacity of the generators that will be installed (updated if different from application)
    - The typical impedance for synchronous and induction machines,
    - If inverter based, specify the proposed inverter and whether it is certified to UL 1741 or CSA C22.2 No 107.1; the number of inverter/transformers; and the size of the generation at each inverter.
  - Number of transformers, kVA rating, typical impedance, proposed winding configuration (wye-wye, wye-delta, delta-wye)
  - If the Line to Ground fault current is > 5 kA or Line to Line fault current is > 8 kA, provide the mitigation solution to address the fault current level at the substation and anywhere along the feeder. FortisAlberta's Protection Technologists cannot determine protection setting requirements until the DER Customer's scope of work is confirmed.

The DER Customer will need to do a protection impact study to confirm that the generator can operate within predefined terms and not island with FortisAlberta's distribution system under a number of system and/or generator operating scenarios.

Once the technical information is received, the Detailed Study can begin. This includes a review of the feeder capacity, the distribution feeder protection review, and the construction estimate to interconnect the generator (for example, rebuilds and upgrades to the distribution system as identified in the high level study). **Typically the Detailed Distribution Study takes 2 to 4 months to complete.**

## **PHASE 4: Transmission System Interconnection Study**

The Detailed Distribution Study occurs in parallel with the Transmission Protection Study, Power Flow Study (if required) and the AESO Behind The Fence (BTF) process. BTF projects are required when the generator nameplate capacity is greater than 5 Megawatts (MW) or a Supply Transmission Service (STS) is required.

### **AESO Behind the Fence Connection Process and TFO Engagement**

FortisAlberta submits a System Access Service Request (SASR) to the AESO for a BTF project and requests the TFO(s) to start the Transmission Protection Study and the Power Flow Study. The DER Customer has the option to hire another study consultant and would then pay the study consultant directly.

- FortisAlberta and the Customer now enter into the AESO BTF gating process. **Typically this stage for the Detailed Study takes 6 to 14 months.**
- **NOTE:** During this stage, AESO has their own timing restrictions and requirements for projects. Failure to meet these required timelines can result in removal from the AESO queue. FortisAlberta reserves the right to remove the project from FortisAlberta's DER queue.
  - AESO will schedule a kick-off meeting with AESO, TFO(s), FortisAlberta and the DER Customer to review and finalize the BTF plan and study scope.
  - TFO submits the BTF Study cases to AESO.
  - AESO creates the draft Engineering Study Report (ESR) and submits it to the TFO.
  - AESO will create a Functional Specification (FS) for the project. This outlines the conditions required to connect the DER Customer to the grid. Examples would be the SCADA points the DER Customer will need to provide, any Remedial Action Scheme (RAS) required to trip the generator under specific conditions (N -1 Condition), transmission upgrades, etc.
  - TFO completes their Transmission Protection Study and develops their Proposal to Provide Service (PPS). Typically it is 6 to 8 weeks to complete this after the FS is issued.

### **PHASE 5: Final Interconnection Proposal is Issued**

FortisAlberta can now prepare the quotation letter package for the DER Customer which includes both the FortisAlberta's distribution costs and the TFO's costs.

**NOTE:** If the initial FortisAlberta estimate for the distribution portion is no longer valid, it will be done again.

A quotation letter package (detailed distribution interconnection cost, pre-paid operating and maintenance cost, and the transmission proposal to provide service costs), which includes;

- Quote Letter
- Detailed study scope document
- Estimate print
- Pre-energizing checklist
- Transmission proposal to provide service

Schedule A with the applicable rate class for the load service

- FortisAlberta must receive the DER Customer's signed Quote letter with approval to proceed within 60 calendar days or the project stale-dates, is cancelled, and removed from the queue.
- FortisAlberta sends invoices for the full Distribution and Transmission costs required for the project to advance to the DER Customer. The available capacity is secured for a further 30 calendar days from the date of invoice. Invoice includes the following:
  - Distribution construction costs
  - O&M costs (20% of the distribution construction costs)
  - TFO PPS costs
- FortisAlberta will advance the project to the Construction Stage upon full payment of all required construction costs (distribution and transmission).
- If payment is not received by the invoice due date, the project will be removed from the queue.

## **PHASE 6: Construct and Commission**

### **Pre-Construction**

To allow some flexibility, the customer may request deferring the construction for a maximum of one year. Should the construction be deferred, FortisAlberta reserves the right to re-quote the project to ensure costs are still relevant. The cost of re-quoting shall be included in the new quote package. If there are changes in DER standards during this period, the DER Customer shall comply with these new requirements.

- FortisAlberta provides the Electric Service Agreement (ESA) to the DER Customer
- FortisAlberta starts the Interconnection and Operating Agreements
- DER Customer returns the signed ESA to FortisAlberta
- FortisAlberta begins work on the construction phase
- FortisAlberta request is sent to the TFO(s) to begin construction
- FortisAlberta continues through the AESO BTF process
- AESO determination of the Customer Contribution Decision (CCD) with the Generator Unit Owner Contribution (GUOC) for the STS amount required. Note: Over a 10 year period the GUOC is returned to the customer based upon meeting AESO performance criteria.

### **Customer Sign-off (Commissioning)**

Key Account Manager works with internal FortisAlberta groups to coordinate the DER integration.

- FortisAlberta works with the DER Customer to complete the pre-energization check list tasks
  - Interconnection Agreement
    - AUC Connection Order
    - AESO Asset ID number
  - Operating Agreement
    - Proposed single line drawings
    - Proposed protection settings
  - Metering Approval
    - DER Customer's metering company to provide the meter certification within seven days of energizing
  - ESA signed, if required, with the FortisAlberta rate for the load service requirement
  - Distribution construction completed
  - FortisAlberta's GIS mapping updated to include new facilities
  - Connection Authorization completed by Customer
    - If DER Customer is an accredited corporation, their Safety Codes Officer sign off that the facility meets all applicable Alberta codes
    - If the DER Customer is a non-accredited corporation, a third party Safety Codes Officer sign off that the facility meets all applicable Alberta codes
  - Electrical Permit copy provided
  - TFO to confirm the transmission connection upgrades are completed (tested)
  - AESO to confirm the BTF project is complete
  - If required: Joint Use Agreement is in place and Distribution Transfer Trip completed (tested)
- DER Customer to request their Retailer to submit an Energization request (ENR) for their load service
- FortisAlberta to coordinate synchronization of the generator to the grid
- DER Customer to provide 'As-Built' SLD to FortisAlberta within 30 days of energizing stamped by a Professional Engineer (P. Eng.), registered to practice in Alberta.
- DER Customer to provide 'As-tested' or 'as left' protection settings to FortisAlberta within 30 days of energizing (stamped by a P. Eng. registered to practice in Alberta)
- DER Customer to have their Metering provider submit their 'field test report' to FortisAlberta within 30 days of energizing



## Questions

Please visit our website at [FortisAlberta.com](http://FortisAlberta.com) *Customer Service/Get Connected* to view detailed information on how to get connected.

Once you are ready to begin your interconnection project you may submit an application form to [generation@fortisalberta.com](mailto:generation@fortisalberta.com).

Please contact a Key Account Manager with any questions regarding the FortisAlberta Distributed Energy Resources Process.

Monique Soboren 403-514-4102 [Monique.Soboren@FortisAlberta.com](mailto:Monique.Soboren@FortisAlberta.com)

Leandro Tomei 403-514-4999 [Leandro.Tomei@FortisAlberta.com](mailto:Leandro.Tomei@FortisAlberta.com)

Jack Wojciechowski 403-514-4028 [Jack.Wojciechowski@FortisAlberta.com](mailto:Jack.Wojciechowski@FortisAlberta.com)