



The line that connects us all



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Overview

This DER Interconnection Guide (the “Guide”) outlines the Distributed Energy Resources (DER) interconnection with FortisAlberta and explains the phases for DER projects (excludes microgeneration). Each phase includes these components:

- Customer Deliverables
- FortisAlberta Deliverables
- Additional Information

If there is a conflict between this Guide and FortisAlberta’s Customer Terms and Conditions of Electric Distribution Service as amended from time to time (the “**T&Cs**”), the T&Cs shall govern. Capitalized terms used within this Guide and not otherwise defined shall have the meaning given to them in the T&Cs.

Disclaimer

LIMITATION OF LIABILITY AND DISCLAIMER: This Guide is not a replacement for electrical codes or other applicable standards. This Guide is not intended or provided as a design specification or as an instruction manual. The Customer, DER owner, employees or agents recognize that they are, at all times, solely responsible for the generator plant design, construction and operation. FortisAlberta Inc., and any person employed on its behalf, makes no warranties or representations of any kind, express or implied, with respect to the contents of this Guide, including, without limitation, its quality, accuracy, completeness or fitness for any particular purpose. FortisAlberta will not be liable for any loss or damage arising from the use of this document, any conclusions a user derives from the information in this document, or any reliance by the user on the information it contains. FortisAlberta reserves the right to amend any of the requirements at any time. Any person or persons wishing to make a decision or take any action based on the content of this Guide should consult with his, her, or their own qualified professional advisors prior to making such decision or taking such action.

Pre-Consultation Application (Optional)

Customer Deliverables

1. Submit a Pre-consultation application to generation@fortisalberta.com.
2. Pay pre-consultation fee.
3. Review the [DER-02 FortisAlberta Interconnection Requirements](#) and other technical documents in the [Distributed Generation Library | FortisAlberta](#)

FortisAlberta Deliverables

1. Verifies application completeness and issues a project reference number to the Customer.
2. Issue invoice to Customer.
3. Once payment is received the FortisAlberta will complete an assessment on the feeders around the locations listed on the application
4. Schedule a meeting to review assessment with customer
The purpose of the meeting:
 - a. Assist Customers who are new to DER to understand the overall connection process, key stakeholders (i.e. deregulated market, AUC etc.) and investigate hosting capacity at their sites of interest prior to entering the DER Queue.
 - b. Information gathering and project scoping phase to help Customer select a location before submitted an HLS application.

Additional Information

1. Pre-consultation is to review the DER Interconnection Guide and a preliminary assessment of the distribution feeder capacity for up to 5 locations.
2. A DER High Level Study (HLS) application is required to initiate a project.
3. A DER Detailed Level Study (DLS) application is required to secure distribution feeder capacity. See Appendix C for queue management practice and governance.

Stage 0: High Level Study (HLS) Application

Customer Deliverables

1. Submit the HLS Application [DER Application Template \(fortisalberta.com\)](https://www.fortisalberta.com/der-application-template) to generation@fortisalberta.com.
2. Pay HLS Application Fee. See Appendix A.
3. Pay TFO HLS Application Fee if applicable. See Appendix A.
4. Review the [DER-02 FortisAlberta Interconnection Requirements](#) and other technical documents in the [Distributed Generation Library | FortisAlberta](#)

FortisAlberta Deliverables

1. Verifies application completeness and issues a project reference number to the Customer.
2. Issues HLS application invoice for FortisAlberta's HLS and the Transmission Facility Owner (TFO) (if applicable).
3. Submit TFO HLS Application to the TFO (if applicable).
4. SRM presents the Customer an option for an HLS project review meeting before the project goes to the engineering team.

The purpose of the meeting will include:

- a. Review DER Guideline.
 - b. If applicable, and in cooperation with the Customer, determine the targeted AESO cluster that this project will proceed under. By default, FortisAlberta will target the ongoing cluster intake as the intended cluster target. FortisAlberta will retain the right to, at its sole discretion, identify the AESO cluster the project will proceed to.
5. After completing all Gate 0 deliverables, FortisAlberta issues a letter acknowledging Gate 0 completion to the Customer.

Additional Information

1. If applicable, review:
 - 1.1 AESO cut-off dates for submission into AESO Cluster Assessment.
 - 1.2 FortisAlberta cut-off dates for submission into AESO Cluster Assessment.
 - 1.3 Impacts of missing target cluster cut-off dates.
2. Refer to all necessary Appendices depending on the scope of project.

Stage 1: High Level Study Results

Customer Deliverables

1. Attends the HLS review meeting if requested.

FortisAlberta Deliverables

1. Complete HLS and send the HLS result to the Customer.
2. Offer to arrange a meeting to review the HLS results with the SRM and DER engineer.
3. Provide a copy of the TFO's HLS-results (if required)
4. After completing all Gate 1 deliverables, FortisAlberta issues a letter acknowledging Gate 1 completion to the Customer.

Additional Information

1. See Appendix A for details.
2. DER Planning completes the HLS based on the HLS application. It is critical that the application is filled out correctly. Once the HLS is completed any changes to the location, feeder, generation size, generation type etc. will require a new HLS and the applicable fees will apply.

Stage 2: Detailed Level Study (DLS) Application and Funding

Customer Deliverables

1. Review the [DER-02 FortisAlberta Interconnection Requirements](#) and other technical documents in the [Distributed Generation Library | FortisAlberta](#)
2. Submit a completed [DLS Application](#) along with the following documents to generation@fortisalberta.com and your SRM:
 - a. Detailed SLD, authenticated by a professional engineer accredited with APEGA. Please refer to Link DER02 for requirements.
 - b. Preliminary site plan
 - c. Generation unit certifications (e.g. UL1741-SB) or a signed commitment to complete the ICAP process (refer to DER-02).
3. Pay all applicable fees.
4. Signed Electric Service Agreement (ESA) if required
5. In cooperation with FortisAlberta, determines the AESO cluster the project will proceed under. By default, FortisAlberta will target the ongoing cluster intake as the intended cluster target. FortisAlberta will retain the right to, at its sole discretion, identify the AESO cluster the project will proceed to.

FortisAlberta Deliverables

1. Verifies application completeness and issues a project reference number to the Customer.
2. DER planning and P&C engineer will review all documents and advise if any changes are required.
3. Invoice all applicable funding. Please see Appendix A for details.
4. Complete a load assessment for Energy Storage Systems (ESS) or DERs that require a large load service
5. Issue an Electric Service Agreement (ESA) if required signed
6. After completing all Gate 2 deliverables, FortisAlberta issues a letter acknowledging Gate 2 completion to the Customer.

Additional Information

1. Once the DLS fee is paid and the required documents for the DLS are provided, the project enters the DER Queue. Please see Appendix C for further details.
2. If the information required from the Customer to complete the DLS is not received within 30 days of the receipt of payment for the DLS study, the project will be cancelled. Please see Appendix C for further details.
3. If the project is required to participate in the AESO interconnection process, the Customer will pay all applicable AESO and transmission fees, including cancellation fees. For a breakdown of AESO fees applicable to projects, see Appendix A, and for current AESO Assessment documentation and fee guidelines.

Stage 3: Distribution Detailed Level Study Results

Customer Deliverables

1. Customer attends the DLS meeting and reviews the results (if applicable).
2. Customer must return a copy of the DLS acceptance within 30 days of receipt, or the project will be cancelled.
3. Provide documents required for SASR submission if applicable (refer to AESO Process).
4. Signed confirmation of Lands re AESO SASR Submission (PDF) letter.
5. Pay all applicable fees.

FortisAlberta Deliverables

1. Complete DLS.
2. Confirm funding has been received and the project has entered the queue.
3. Confirm project funding with the AESO and TFO if applicable.
4. Pay invoices issued by the AESO and TFO if applicable.
5. Submit SASR if applicable.
6. Preliminary Review:

Over 5 MW:

- a. Internal review of DLS with Project Manager, Designer, Construction Coordinator, DER Planning, P&C, and SCADA team when applicable.
- b. Preliminary site check if warranted – based on the outcome of (a) above.
- c. Completes a Class 5 preliminary distribution design and estimate:
 - i. review of basic route, engineering comments, and immediate scope that can be accounted for and discussed in the DLS meeting.
 - ii. Any/ all revisions based on estimate captured and any revision DLS is made.

Under 5 MW:

- a. Reconfirm the project is under 5 MW.
- b. Manages project deliveries and tasks its design team and Area Coordinator
- c. Complete the distribution design and estimate.

Note: There are some instances where MW is not the only contemplated variable in the determination of what business unit is tasked to deliver the project. Please refer to your SRM for confirmations specific to a project.

7. Provide DLS results, Fortis SLD and estimate to the Customer after Preliminary Review.
8. Schedules and chairs a DLS meeting with relevant FortisAlberta groups.
9. Send the completed Interconnection Scope Form to the TFO.

10. Engages Operations Planning to initiate any further applicable AESO interconnection procedures (if applicable and in conjunction with the latest AESO connection procedures), including the SASR. Please visit www.aeso.ca for more details.
11. Schedules site visit (Designer, PM, SRM, Construction Coordinator) if and when necessary.
12. Acknowledges receipt of Customer-accepted DLS and submits SASR to the AESO.
13. After completing all Gate 3 deliverables, FortisAlberta issues a letter acknowledging Gate 3 completion to the Customer.

Additional Information

1. By signing the DLS, the Customer is not agreeing to final costs for construction.
2. Once the DLS fee is paid and the required documents for the DLS are provided, the project enters the DER Queue. Please see Appendix C for further details.

Stage 4: Design and Pre-Construction

Customer Deliverables

1. Engineering Requirements:
 - i. For validation of the DLS, within 30 days of the Final Interconnection Proposal payment, the Customer shall provide the latest SLD authenticated by a Professional Engineer registered with APEGA.
2. Preliminary Engineering Studies submitted to FortisAlberta as required.
3. Project schedule (from Customer) including order confirmations and delivery dates from vendors.
4. The Point of Common Coupling (PCC) must be clearly defined at the Customer site in a site plan.
5. Signs Quotation Package to move it into acceptance within 30 days of receiving.
6. Funds Quotation Package within 60 days of signing in acceptance.
7. Returns signed ESA if applicable.

FortisAlberta Deliverables

Engineering:

1. FortisAlberta receives Final TFO interconnection scope form.
2. Preliminary Study Review. Refer to [Pre-energization Checklist](#).
3. FortisAlberta initiates and completes telecom assessment.
4. FortisAlberta completes detailed study validation.

Project Delivery:

1. FortisAlberta receives Final TFO service proposal document and ensures the Customer has reviewed with the TFO. FortisAlberta SRM, Engineering and Customer attend TFO meeting to review.
2. Site visit if required (designer, PM and SRM).
3. Engages Operations Planning to provide preliminary Operating Procedures agreed to in principle.
4. Prepares Preliminary Interconnection Agreement (IA) document to be agreed to by Customer in principle.
5. Provides the Customer with a Final Interconnection Proposal (Quotation Package) that outlines the final cost for distribution and transmission infrastructure upgrades required to interconnect the project (detailed distribution interconnection cost, virtual load, pre-paid Operating and Maintenance (O&M) cost and Transmission Facility Owner (TFO) Proposal to Provide Service (PPS) costs).
6. Construction is initiated upon Customer acceptance and payment of all costs.
7. FortisAlberta coordinates invoicing with TFO.
8. Complete AESO deliverables. See www.aeso.com for further information.
9. Once funding is received, SRM notifies the construction PM to commence project.
10. After completing all Gate 4 deliverables, FortisAlberta issues a letter acknowledging Gate 4 completion to the Customer.

Additional Information

1. The Detailed Level Study Validation is to determine if there are scope and/or engineering standard changes that have occurred since the issuance of the Detailed Level Study. If the engineering validation triggers material changes to the project, FortisAlberta reserves the right to requote based on updated engineering requirements.
2. The Customer can decide to withdraw the project based on the distribution cost; in which case the project will be cancelled.
3. FortisAlberta must receive the signed Interconnection Proposal Quote Letter within 30 calendar days or the project will be cancelled.
4. Once the signed Quote Letter is received, FortisAlberta will send the construction invoices for the full construction cost, Distribution, Transmission, O&M, and the IA fee.
5. FortisAlberta must receive the payment within 60 calendar days to advance the project to the construction stage. If the full payment is not received within 60 calendar days, the interest charges detailed on the invoice will begin to accrue.
6. If the full payment is not received within 60 calendar days, the project will be cancelled. The Customer is responsible for ensuring payments have been made on time. FortisAlberta will not provide reminders to the Customer.
7. FortisAlberta recommends the preliminary submission of engineering studies is completed as early as possible; approximately 6 months before the 110 day requirement.
8. Any additional interconnection equipment purchases that resulted from engineering study findings or otherwise, must be submitted prior to gate letter.
9. Variances in actual construction costs will be trued-up at the end of delivery. Variances will include prolonged displacement of in service dates and the meeting coordination involved over time.

Stage 5: Distribution Construction and 110 Day Package

Customer Deliverables

1. Complete the 110-day checklist with FortisAlberta and submit the 110-day package. Refer to DER-02.

FortisAlberta Deliverables

1. Begin construction activities for project delivery
2. Receives, assigns internally, and reviews 110-day package
3. Approves 110-day package
4. Coordinate any ISD changes interdepartmentally.
5. After completing all Gate 5 deliverables, FortisAlberta issues a letter acknowledging Gate 5 completion to the Customer.

Additional Information

1. The Customer shall have all deliverables in the 110-day package approved on or before 110 days prior to In Service date.
2. The preliminary submission of engineering studies must be the point which FortisAlberta approves the engineering studies. These studies must be complete and approved for the submission of the 110 Day Package (and not approved within the 110 days to ISD).
3. Supervisory Control and Data Acquisition (SCADA) process – Customer will install the SCADA Junction Box (pick up from area office with installation directions), DNP3 map points list location supplied for approval.

Stage 6: Load Energization (Optional to schedule ahead of time)

Customer Deliverables

1. Complete checklist for load energization in DER-02 and pre-energization checklist.

FortisAlberta Deliverables

1. FortisAlberta reviews and approves deliverables as stated in DER-02 and pre-energization checklist
2. Coordinate any ISD changes interdepartmentally.
3. After completing all Gate 6 deliverables, FortisAlberta issues a letter acknowledging Gate 6 completion to the Customer.

Additional Information

1. The Customer may not require to energize as a load prior to export. However, the deliverables in this Stage are still a requirement as part of any interconnection.
2. Changes to the commissioning plan require a minimum of 45 days notice before energization. FortisAlberta cannot guarantee representatives will be available if less than 30 days notice is provided.
3. FortisAlberta reserves the right to leave commissioning activities if the commissioning activities deviate from the submitted commissioning plan. FortisAlberta will require a minimum of 45 days to reschedule commissioning activities, from the date the new commissioning plan is received.

Stage 7: 30 Day Energization Package

Customer Deliverables

1. Complete 30 Day Package as provided in the DER Interconnection Package Checklist. Please refer to DER-02.

FortisAlberta Deliverables

1. Reviews and approves deliverables as stated in 30 Day Energization Package and DER-02.
2. Coordinate any ISD changes interdepartmentally.
3. After completing all Gate 7 deliverables, FortisAlberta issues a letter acknowledging Gate 7 completion to the Customer.

Additional Information

1. The Customer shall have all deliverables in the 30 Day package approved on or before 30 days prior to In Service date.
2. Changes to the commissioning plan require a minimum of 45 days notice before energization. FortisAlberta cannot guarantee representatives will be available if less than 30 days notice is provided.
3. FortisAlberta reserves the right to leave commissioning activities if the commissioning activities deviate from the submitted commissioning plan. FortisAlberta will require a minimum of 45 days to reschedule commissioning activities, from the date the new commissioning plan is received.

Stage 8: Commissioning

Customer Deliverables

1. Complete checklist for Commissioning in DER Interconnection Package Checklist. Please refer to DER-02.

FortisAlberta Deliverables

1. FortisAlberta receives and reviews 30- day pre-energization package.
2. FortisAlberta will initiate construction cost true-up including a Final Cost Review.
3. After completing all Gate 8 deliverables, FortisAlberta issues a letter acknowledging Gate 8 completion to the Customer.

Additional Information

1. Changes to the commissioning plan require a minimum of 45 days notice before energization. FortisAlberta cannot guarantee representatives will be available if less than 30 days notice is provided.
2. FortisAlberta reserves the right to leave commissioning activities if the commissioning activities deviate from the submitted commissioning plan. FortisAlberta will require a minimum of 45 days to reschedule commissioning activities, from the date the new commissioning plan is received.

Stage 9: In Service

Customer Deliverables

1. Complete checklist for Operating Stage in DER Interconnection Package Checklist. Please refer to DER- 02.
2. Comply with current industry standards and Interconnection Agreement.

FortisAlberta Deliverables

1. FortisAlberta manages standards with updates in the industry, codes, and external standards.
2. FortisAlberta proceeds to complete a Final Cost Review and will submit an itemized refund or invoice to the Customer.
3. Formal project closure.
4. Notify the AESO of DFO, TFO, and GFO deliverables met and the generator is considered in service.
5. After completing all Gate 9 deliverables, FortisAlberta issues a letter acknowledging Gate 9, project completion to the Customer.

Additional Information

1. Final cost review and true-up can take up to six months and includes TFO true-up.

Annex A Documents and Forms

[Distributed Generation Library | FortisAlberta](#)

Appendix A: Fee Schedule [Distributed Generation Library | FortisAlberta](#)

Appendix B: AESO Interconnection process and FortisAlberta [Distributed Generation Library | FortisAlberta](#)

Appendix C- FortisAlberta Queue Management Practice [Distributed Generation Library | FortisAlberta](#)
[FortisAlberta Customer Generator Options](#)

[Third-Party Authorization Distributed Generation](#)

Pre-Application form in [Distributed Generation Library | FortisAlberta](#)

Small Scale Generation Application form in [Distributed Generation Library | FortisAlberta](#)

High Level Study Application form in [Distributed Generation Library | FortisAlberta](#)

Detailed Level Study Application form in [Distributed Generation Library | FortisAlberta](#)

[DER-02 - FortisAlberta Technical Interconnection Requirements...](#)

[DER-02A - FortisAlberta – Engineering Study Requirements for DER Interconnections](#)

[DER-02B - FortisAlberta – Effective Grounding Study Requirements...](#)

[DER-02C- FortisAlberta – Bulk System Fast Frequency Response and Contingency Reserve Requirements...](#)

[DER- 02D- FortisAlberta ICAP Technical Requirements...](#)

[DER- 02E - FortisAlberta ICAP Process Requirements...](#)

[DER Inverter Configuration Template \(XLSX\)](#)

[FortisAlberta- DER Interconnection Package Checklist \(PDF\)](#)

[Interconnection Protection Settings & Commissioning \(IPSC\) \(PDF\)](#)

[Maintenance Verification Report](#)

[Sample – Maintenance Verification Report](#)

[Service and Metering Guide](#)

[Power Quality Benchmark Compliance - Template V1.2 \(DOCX\)](#)

Alberta Electric System Operator (AESO)

[Connecting to the grid » AESO](#)

<https://www.aeso.ca/assets/DER-Ride-Through-Performance-Recommendations.pdf>

Annex B Glossary of Acronyms

FortisAlberta

CRM:	FortisAlberta's main project management tool
DER:	Distributed Energy Resources (DGs, MGs, etc. connecting to the distribution system)
DG:	Distributed Generation
MG:	Micro-Generation
DLS:	Detailed Level Study
Energize:	power to site
ESA:	Electrical Service Agreement
FCC:	FortisAlberta Control Centre
HLS:	High Level Study
IA:	Interconnection Agreement with Operating Procedures agreement
ISD:	In-Service Date (DER exporting onto FortisAlberta system)
OIC:	Operator-in-Charge
OP:	Operating Procedures
PCC:	Point of Common Coupling
P&C:	Protection and Control
SCADA:	Supervisory Control and Data Acquisition
SRM:	Stakeholder Relations Manager
SSG:	Small Scale Generation
TFO:	Transmission Facility Owner

Alberta Electric System Operator (AESO)

BTF:	Behind the Fence
EC:	Energization Checklist
ESR:	Engineering Study Report
FS:	Functional Specification
GUOC:	Generator Unit Owner Contribution
MARP:	Maximum Authorized Real Power
PDUP:	Project Data Update Package
SAS:	System Access Service
SASA:	System Access Service Agreement
SASR:	System Access Service Request
STS:	Supply Transmission Service

AESO Acronym list: [Behind the Fence \(BTF\) Process » AESO](#)

Transmission Facility Owner (TFO)

PPS:	Proposal to Provide Service (costs for approval)
SOW:	Scope of Work