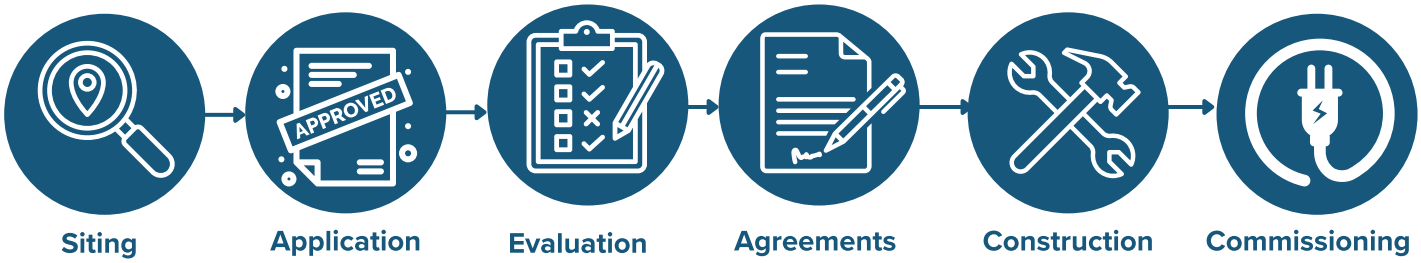
Steps in the Interconnection Process

Introduction

Interconnection is the process by which distributed energy resources (DER) projects, such as solar and energy storage below 20 MW, that generate electricity are approved to connect to the electric grid. DER projects are typically connected to the distribution system. The DER interconnection process includes a series of administrative and technical steps that electric utilities undertake to determine whether any grid upgrades are needed for a proposed project to safely interconnect.

Simplified Interconnection Steps



Siting

Publicly available tools and resources are used to determine whether DERs are economically viable at a particular location. Some of these tools include:

- Hosting Capacity Analysis - A utility-performed study, typically updated quarterly or monthly, of the conditions on a utility's distribution grid and the grid's ability to host additional DERs at different locations. The results are typically displayed in the form of maps or tabular data files.
- Pre-Application Report - A report generated by the utility at the request of a customer to provide technical information about a specific point of interconnection, such as the ability of the grid to accommodate additional DERs at that location.
- Public Queue - A regularly updated, sortable spreadsheet or report that shows the order of projects in the interconnection review process, their status, and the locations of queued applications. This can give prospective applicants a realistic sense of when their application will be reviewed and help them determine which locations may have limited capacity and thus be more likely to require additional review or costly grid upgrades.

Application

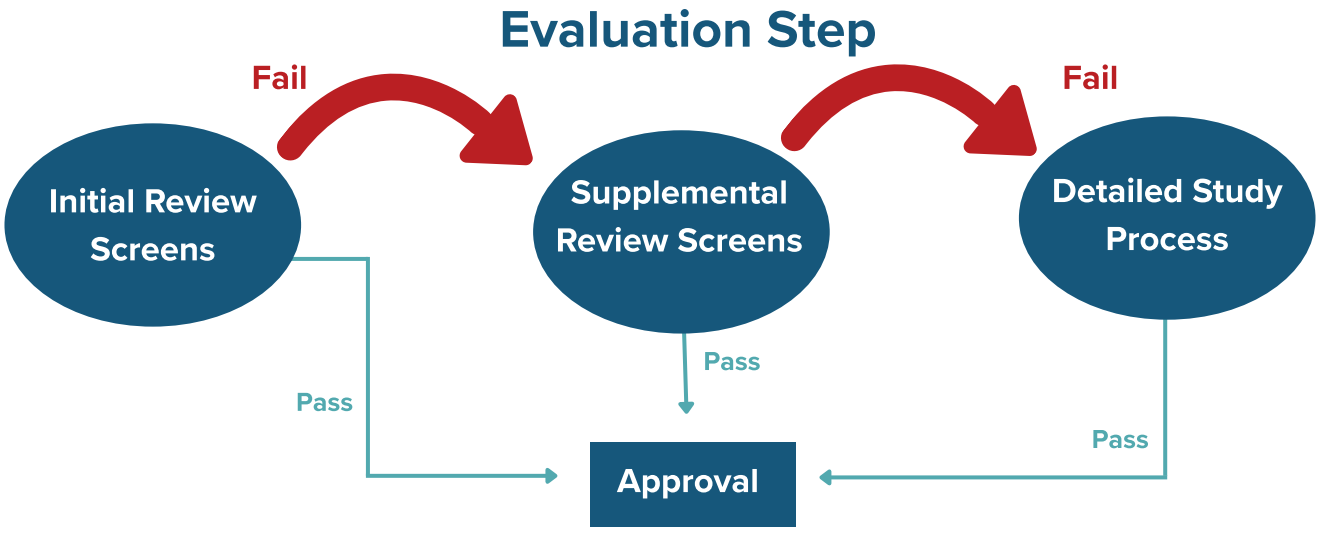
The customer submits an application to the electric utility with details about the proposed project, including:

- System design details (e.g., DER project size, location, inverter size, equipment models and specifications)
- Intended use (e.g., non-export, limited-export, net metering)[1]
- Information about the installer/contractor that will build the system
- Application fee

[1] Non-export refers to projects that only use generated power for on-site consumption and do not send power back to the grid. Limited export refers to projects designed with a cap on the maximum amount of power they will export to the grid. Such systems can export to the grid and serve power onsite. Net metering refers to when projects participate in a state DER compensation program and receive compensation for power they send back to the grid.

Evaluation

The proposed project is evaluated by the utility to determine if it could cause any adverse impacts to the grid that require additional study or upgrades. If the project is unlikely to have adverse impacts on the grid due to its size or relatively low levels of solar on the circuit, a conservative screening process is used that expedites the review process. If it fails these screens and the less conservative supplemental review process, it will need to go through a more thorough—and more expensive—engineering evaluation if it still seeks to interconnect.



The project's size and/or complexity determine the review path it takes. Some of the different options include:

- **Simplified Process:** Conservative screens for small projects (typically residential or small commercial up to 25kW) that can be approved in days. The Simplified processes usually have fewer screens than the Fast Track process. If any screens are failed, the project can undergo a supplemental review which provides yet another pathway to avoid resource-intensive and costly detailed studies.
    - e.g., 10 kW residential rooftop solar PV project
- **Fast Track Process:** More technical and precise screens to assess impact of larger commercial projects (typically up to 2 MW) and provide an approval pathway in a few weeks. The Fast Track processes usually have more screens than the Simplified process. If any screens are failed the project can undergo a supplemental review, providing yet another pathway to avoid resource-intensive and costly detailed studies.
    - e.g., 500 kW commercial rooftop solar PV project
- **Detailed Study Process:** The review process for the largest and most complex projects or those that fail to pass the Simplified or Fast Track screens. This process, which can take several months or more, identifies what impacts the project may pose to the grid, the grid upgrades needed to prevent any adverse impacts, and the costs and timelines to construct these upgrades.
    - e.g., 5 MW community solar PV project

At the end of the screening process (including any additional reviews—like Supplemental Review or Detailed Study—the project may have to go through as a result of failing an earlier screen), there are two possible options:

- **Move Forward (Approved by Utility)** - If a project passes all required technical screens with the determination that no upgrades are required, or the required upgrades identified are financially feasible to the project owner, the project may proceed to the agreements stage.

- **Withdraw the Application (Failed Review or Requires Unaffordable Upgrades)** - If a project fails to pass the evaluation process or the upgrades identified as necessary for it to proceed are financially infeasible or the project owner is unwilling to pay them, the project owner may abandon the project. Alternatively, they may reapply for interconnection after making adjustments to system design (e.g., reducing the project size).

Agreements

- The customer and utility agree to the terms of interconnection, including payment for any necessary upgrades, responsibilities of the parties during and after construction, operating requirements, and/or maintenance.

Construction

- The customer and utility complete the construction of the generation facilities, interconnection equipment, and any necessary grid upgrades.

Commissioning

- The utility requires and/or performs a series of final system checks before authorizing the customer to start generating (permission to operate).

More information on effective interconnection procedures can be found in IREC's *Model Interconnection Procedures*, which are a compilation of best practices for DER interconnection regulation from across the country. Wonder how well your state's interconnection procedures stack up? Review IREC's state interconnection scorecards at Freeing the Grid.