

Customer Generation

What you need to know about interconnecting to Consumers Energy's electric distribution system.

What is Customer Generation?

Even though we provide homes and businesses with reliable electric service, we recognize that some customers may want to generate their own electricity. Or some may prefer to generate electricity for sale to Consumers Energy. This is "Customer Generation."

Whether you have a wind turbine, solar photovoltaic system, microturbine, fuel cell or some other energy resource, this information will help you determine the eligibility, necessary infrastructure and other requirements to generate or sell your own renewable or nonrenewable electricity to Consumers Energy. This process is called "Interconnection."

Once interconnected, customers have a number of options available for the sale of the electricity generated. The interconnection process, electricity generation options, necessary steps and requirements are discussed in detail in this guide.

Safety and System Reliability

Safety for the public and our employees is our top priority. Interconnections must be completed in a way that protects the public, workers and the electric system from risks that could result from improper installation of Customer Generation.

In order to interconnect a self-generating electricity system to Consumers Energy's electric distribution system, you must comply with applicable state rules and tariffs established by the Michigan Public Service Commission (MPSC). All installations must comply with the MPSC Electric Interconnection Standards R460.601-R460.656.

For more information about interconnecting Customer Generation to Consumers Energy's electric distribution system, visit our Web site at www.consumersenergy.com.

Your Responsibilities

You and your contractor or installer are responsible for coordination of the design, installation, operation and maintenance of any Customer Generation system you install, and for conforming with the requirements of Consumers Energy's tariffs and rules, and applicable governmental laws and regulations (local, state and federal).

You are responsible for the proper installation, operation and maintenance of the specified protective devices. You also are responsible to obtain, at your expense, any and all authorizations, permits and licenses required for the construction and operation of your generating facilities.

Our Responsibilities

We are responsible for completing the steps listed in this guide in a timely manner and for meeting all required steps and timelines necessary to process your interconnection application. We will designate a primary contact to assist you with any questions or information you need to complete your Interconnection.



Contact Us:

Visit us at www.consumersenergy.com.

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General Interconnection Process

The following steps are required by state law to interconnect to Consumers Energy's electric distribution system. Please consult the References section of this document for actual state law and associated guidelines.

1 — Starting the Interconnection Process

Customer: Let us know that you wish to interconnect an electric generating system (project) to Consumers Energy's electric distribution system.

Consumers Energy: We will furnish you with the required materials to complete your interconnection application. All documents, forms and applications also may be found on our Web site: www.consumersenergy.com.



2 — Completing the Interconnection Application

Customer: Complete and submit the standard Interconnection Application to the name and address on the form. A completed application consists of: (1) all required data fields filled in and (2) a filing fee. NOTE: This fee shall not be less than \$75 or more than \$500. The fee amount is based on the generator size.



3 — Application Review

Consumers Energy: Within 10 business days, we will notify you if your application is complete. If any portion of the application, interconnection data or filing fee is incomplete or missing, the unapproved application will be returned with the deficiencies clearly identified. After we approve the application, we must determine whether an Engineering Review is required (e.g., Inverter Based Generators with UL certification meeting IEEE 1547-2003 and 1547.1-2005 usually do not require a review). If we determine an Engineering Review is required, the parties will be required to execute an Engineering Review Agreement. The Engineering Review determines whether a Distribution Study may be required. If an Engineering Review is not required, proceed to Step 7 in the Interconnection Process.



4 — Engineering Review Agreement

Consumers Energy: We will determine the parameters of the Engineering Review and send you an Engineering Review Agreement with the Engineering Review cost. Review, sign and return the Generator Interconnection Study Agreement.

Customer: Review, sign and return the Engineering Review Agreement with payment for the Engineering Review (if applicable).

Consumers Energy: After receiving your signed Engineering Review Agreement and payment, we will determine the impact of your project on our electric distribution system. If we determine any system modifications are required for safe and reliable interconnection of your project, the parties may be required to execute a Distribution Study Agreement (e.g., Inverter Based Generators with UL certification meeting IEEE 1547-2003 and 1547.1-2005 usually do not require a study). We will inform you of the Engineering Review results and an estimated cost of any system modifications.

Customer: Based on the system modifications estimated cost, you will determine whether to proceed with the project. Note: the utility is not bound by this approximate estimate. Notify us if you intend to proceed with the project. If the project will proceed, a Distribution Study Agreement may be executed.

5 — Distribution Study Agreement

Consumers Energy: We will determine the parameters of the Distribution Study and send you a Distribution Study Agreement with the Distribution Study cost (if applicable).

Customer: Review, sign and return the Distribution Study Agreement with payment for the Distribution Study.

Consumers Energy: After receiving your signed Distribution Study Agreement and payment, we will perform the study to determine a detailed cost estimate for upgrades to our electric distribution system. We will inform you of the Distribution Study results.

Customer: Based on the system modifications estimated cost, you will determine whether to proceed with the project. Notify us whether or not you intend to proceed with the project.

6 — Project Design and Construction

Customer: Inform us in writing of your intent to pay the costs identified in the Distribution Study and to proceed with design and construction.

Consumers Energy: After a mutually agreed upon time period, we will proceed with the design and construction phase. This may include acquisition of necessary rights of way and procurement of required equipment, all at your expense.

Customer: Review and make payment on the bill for our system modifications (as described above). Notify us when generator installation is complete.

7 — Commissioning Test Report and Final Reconciliation

Customer: Submit a completed commissioning test report.

Consumers Energy: Within five business days after receipt of the completed commissioning test report, we will approve or deny the project for interconnection. If the project is approved, a written statement of final approval, final cost reconciliation and a Generator Interconnection Operating Agreement (GIOA)/Contact List will be provided. If the project is not approved, we will provide details on corrective actions required for approval.

Customer: Sign and return the Generator Interconnection Operating Agreement (GIOA)/Contact List. The Generator Interconnection Operating Agreement (GIOA) will cover interconnection requirements, such as: system operation, defaults and remedies and liability.



8 — Generator Interconnection Operating Agreement and Parallel Operation

Consumers Energy: After receiving the signed Generator Interconnection Operating Agreement (GIOA)/Contact List, the project will be authorized for parallel operation.

Customer: After authorization, begin parallel operation.

9 — Ongoing Operations

Both Parties: Maintain current contact information. Consumers Energy’s contact information is listed at the beginning of this document.

References

A list of documents and other references you’ll need is provided below. You may receive copies of the latest versions of these documents from Consumers Energy by visiting our Web site at www.consumersenergy.com.

- 1. Technical Requirements:** Technical requirements for the interconnection of your project depend on the aggregate generator output of the project. For specific generator output requirements, visit our Web site at www.consumersenergy.com under the For Business/Customer Generation/Interconnection Process/Michigan Electric Utility Generator Interconnection Requirements section.
- 2. Net Metering Program:** Net metering allows retail electric utility customers who generate a portion or all of their own retail electricity to be billed only for their net energy use during each billing period. For more information, visit our Web site at www.consumersenergy.com under the For Business/Customer Generation section.
- 3. Energy Purchase Agreement:** An Energy Purchase Agreement allows electric utility customers who generate a portion or all of their own electricity needs from a renewable energy system or cogeneration system to sell their excess energy to Consumers Energy on a billing month basis. For details, visit our Web site at www.consumersenergy.com under the For Business/Customer Generation section.

Summary

Properly designed and applied customer generating systems provide an alternative means of generation to help meet the nation’s future electricity needs. Consumers Energy encourages and supports customers who wish to explore their own generating projects.



Customer Generation

Distributed Generation Definitions

Customer Generation also is referred to as distributed generation and represents an evolving and promising set of power technologies that typically has the following attributes:

- Sited close to customer or located at a substation to support the electric distribution system
- Output is tailored to customer needs
- Generating capacity is between 1 kilowatt and 10 megawatts
- May be customer-, utility- or third-party owned

Distributed generation can help meet a number of electricity needs

Backup power: Also referred to as emergency or standby power, this option offers electricity in the event of loss of electric supply from the utility's system.

Combined heat and power: An electric generating device produces electricity and usable heat energy. This can be a benefit to customers with daily electricity needs that also require heat or process steam generation. Larger systems commonly are called cogeneration.

Peak shaving: Helps customers reduce electric demand charges. Peak shaving may relieve electrical system stress during periods of peak demand and allow the customer to avoid on-peak demand charges and higher priced on-peak energy.

Primary power: Provides a majority of a customer's electricity needs and uses the local utility electrical grid to supply backup and supplemental power.

Stand-alone power: The customer receives primary electrical service without utility backup. The customer is completely isolated from the utility.

Distributed generation comes from a number of sources and offers different technologies

Biomass/agricultural digesters: An anaerobic digester processes farm manure by converting the waste products over time into methane.

Energy storage devices: Any device that stores energy for later use. These can include: batteries, compressed air, flywheels and super magnetic energy.

Fuel cells: Rather than burning fuel, this emission-free alternative produces electrical energy through an electrochemical process using fuels such as liquid hydrogen and liquid oxygen.

Industrial gas turbines: Large combustion turbines that generate in the range of 1 kilowatt to 10 megawatts.

Internal combustion engines: Fueled by diesel or natural gas, these devices are similar to an automotive engine and drive an electrical generator.

Microturbines: Small combustion turbines that burn natural gas to produce less than 500 kilowatts of electric power. They are known for simple design, modularity and fuel flexibility.

Solar/photovoltaic: These devices change sunlight (radiant energy) directly into electricity and typically are connected to the utility distribution system. Photovoltaic systems can be used in remote locations that are not connected to the electric grid. They also are used to power watches, calculators and lighted road signs.

Stirling engines: Invented in 1816 before gasoline and diesel engines, a Stirling engine can use any type of fuel, as well as solar energy and hot spring heat. It's a sealed external combustion heat engine that provides quiet and efficient power.

Wind: A renewable source of energy that is captured by wind turbine generators. Installations include single and multiple towers. Wind turbine towers generally stand between 250 and 330 feet tall. Each turbine blade is about 150 feet long. For the end user, wind power is indistinguishable from power generated from conventional generating sources.

Selling power to others

A customer that generates 5 megawatts or more of electricity within our service territory may sell power to another utility. In this scenario, we may transmit or wheel the power from your facility for a fee. You will need to make separate arrangements with Consumers Energy and Michigan Electric Transmission Company, LLC, an ITC Company, to transmit power to others. Consumers Energy would continue to supply supplementary, standby and maintenance power as required.