

Central Virginia Electric Cooperative

Consumer Guidelines for Electric Power Generator Installation and Interconnection

What This Guide Covers

This document has been prepared to explain the process to install all types of generation systems at homes, farms, and businesses served by Central Virginia Electric Cooperative. It includes guidelines for installing small emergency generators, standby power systems, net energy metering, and interconnected systems designed to export energy to the power distribution system.

It is the intent of the Cooperative to allow members to install generation equipment, provided the member's equipment does not adversely affect the safety or operation of the Cooperative's power distribution system, and meets the following criteria:

- A. Interconnected systems are rated less than 20 MW of total generation capacity
- B. Not intended for wholesale transactions
- C. Not anticipated to affect the transmission system

This document is not a complete description or listing of all rules and regulations pertaining to generation systems. The member requesting to install a generator is responsible for and must follow the rules and regulations of the Virginia State Corporation Commission (SCC) and local authorities as well as the Cooperative's Terms and Conditions and applicable service rules.

Your cooperative stands ready to work with you to guide you through the application process and to ensure that your generation equipment is installed in a proper and safe manner.

We can help you determine the appropriate procedures to follow for your specific generator installation and provide you with the application form and other documentation that you will need for a successful project.

Contact Us

Central Virginia Electric Cooperative
P.O. Box 247
Lovington, VA 22949
(800) FOR-CVEC

Special Accelerated Application Process for Small Generators

If you are planning to install photovoltaic (PV), wind, or engine generators rated not more than 20 kilowatts (kW) in a home or farm, we have established a special streamlined process to make it easy for you to complete the installation.

Not to be Interconnected

If your small generator is connected to your home or farm wiring, but will not be interconnected with the electric power system, there is no need to contact us. Also, there is no formal application or fee required.

To be Interconnected for Net Energy Metering

If you are planning to interconnect your generator with the cooperative's electric power distribution system for net energy metering, you need to complete the SCC Form NMIN (Net Metering Interconnection Notification) and submit it to us to receive approval to interconnect prior to installation. Please refer to section II.A. below for additional information.

I. Generators Not Interconnected to the Power Distribution System

If you are considering installation of a small emergency generator, typically running on gasoline, propane, or diesel fuel, you are probably not planning to interconnect your generator with the electric power distribution system. It is important that your installation is safe to you, safe to other customers and to our utility workers. It also should not interfere with the Cooperative's reliable supply of electric power to your residence or other facility.

To accomplish this, care must be taken to install your generator so that it will either 1) only start up to serve your entire load when you have disconnected from the electric power grid by means of an automatic or manually operated switch, or 2) only serve isolated loads where there is a choice of power supply (the cooperative system or your emergency generator).

Your Cooperative engineers are available to help you review your installation plans to ensure that to the greatest extent possible you will not compromise the safe operation or reliability of the cooperative's electric distribution system.

II. Generators Interconnected to the Power Distribution System

When installing a generator and planning to interconnect to the distribution system, we must review your plans to ensure that personnel safety and system reliability will not be compromised.

For all interconnected generators, regardless of size, fuel type, or method of operation, the responsible party must submit an application for interconnection in accordance with SCC regulations.

The application forms, review process, fees, insurance requirements, and contract documents are determined by the size and type of interconnected generator. Any type of interconnected generator will fall into one of three categories:

<u>Category</u>	<u>Governing Rules</u>
1. Net Energy Metering	20VAC5-315
2. Interconnected Generators up to 20 MW	20VAC5-314
3. Generators Larger Than 20 MW	Negotiated case by case

The following information is intended as a general guideline to help you understand the application process. For complete details, please refer to CVEC's Schedule SGI, and the SCC's rules of Chapters 314 and 315.

A. Net Energy Metering

General Requirements

Chapter 315 of the SCC regulations (20VAC5-315) establishes the requirements for customers owning and operating an electrical generator that uses renewable energy as its total fuel source and is intended primarily to offset all or part of the net metering customer's own electricity requirements.

The most common type of generation system in this category is a residential solar system. Wind, biomass, geothermal, and hydroelectric generation are also permitted under the net energy metering rules, subject to local ordinances.

In order to qualify as a net metering facility, all requirements of Chapter 315 must be met. These include:

1. Generation capacity may not exceed 20 kilowatts for residential customers or 1,000 kilowatts for nonresidential customers.
2. The generation equipment is owned and operated by the customer or the customer's contractor.

3. The generation equipment is connected to the customer's wiring on the customer's side of the electric meter.
4. The customer provides a properly completed Form NMIN (Net Metering Interconnection Notification) at least 30 days prior to interconnection.

Rules and Regulations for Net Energy Metering

The following documents apply to all new net metering installations:

- CVEC Schedule NEM-10, Net Energy Metering Rider
- CVEC Terms and Conditions for Providing Distribution Service
- SCC Regulations Governing Net Energy Metering, 20VAC5-315
- SCC Form NMIN

All of these documents are available by contacting the Cooperative's office, or by visiting CVEC's web site at:

<http://www.mycvec.com/solar---wind-power.html>

Net Metering Application Process

If you are considering installing a net metering system to offset all or part of your own energy requirements, research your options carefully so that you will select the appropriate size system for your home or business and make informed decisions on system components, contractors, state and federal incentives, and costs.

Review the rules and regulations listed above, and contact the Cooperative with any questions you may have about the net metering program. Once you have made a decision to purchase a system, follow these steps to a successful installation:

1. Obtain a copy of Form NMIN by contacting the Cooperative or visiting our web site. See page 11 for contact information.
2. Notify CVEC and receive approval to interconnect prior to the installation of an electrical generating facility.
3. Your equipment vendor must sign the Form NMIN to certify that the equipment is in compliance with the applicable standards of Underwriters Laboratories and the IEEE.
4. Your equipment installer must sign the Form NMIN to certify that the equipment has been installed in accordance with the manufacturer's specifications and the National Electrical Code.
5. Submit the completed Form NMIN to the Cooperative at least 30 days prior to interconnection. There is no application fee.

6. A lockable, utility-accessible, load breaking manual disconnect switch with visible open contacts must be installed at the point of interconnection.
7. The installation must be inspected and approved by the county electrical inspector.
8. Contact the Cooperative to schedule a final inspection of the system. This inspection is mandatory. We will perform a site visit to certify that the generating equipment meets the requirements of 20VAC5-315 and that the appropriate disconnect switch is installed. There is a \$50 fee for this service.

Net Metering Capacity

In a typical net metering arrangement, any energy generated in excess of the customer's own energy usage will be carried forward to the next billing period as a credit, and the customer will be required to pay only the Basic Charge for that billing period. However, per state law, the capacity of any generating facility installed shall not exceed the expected annual energy consumption based on the previous twelve months of billing history or an annualized calculation of billing history if twelve months of billing history is not available.

B. Generator Interconnections Other Than Net Metering

Applicability

Chapter 314 of the SCC regulations (20VAC5-314) establishes standardized interconnection and operating requirements for the safe operation of electric generating facilities with a rated capacity of 20 megawatts (MW) or less. These regulations apply to retail electric customers and independent generation facility operators on any electric utility in the Commonwealth of Virginia. The regulations do not apply to customer generators operating under a Net Energy Metering arrangement.

Generator interconnection service does not include the purchase or sale of the output of the generator, station service, backup-up power, the delivery of the output of the generator, nor any form of supply or delivery of electricity to the Interconnection Customer. The Interconnection Customer shall make separate arrangements for any such services that it desires to purchase.

General Application Requirements for Generator Interconnections

Generators that are interconnected with an electric utility are required to meet certain standards for safety and reliability. It is the responsibility of the Cooperative to obtain information about the system to be installed, perform an interconnection study to evaluate the impact of the generator on the utility system, determine if utility upgrades are required to accommodate the generator, and provide a written report of the study results.

There are three review paths for the interconnection of generation having an output of not more than 20 MW:

1. Level 1 - No larger than 500 KW
2. Level 2 - Larger than 500 KW and less than 2 MW
3. Level 3 - Larger than 2 MW and less than 20 MW

Each level of generation has a specific application form, fee schedule, engineering review process, insurance requirements, and operating agreement.

The application process is technically complex, particularly for Levels 2 and 3 interconnections. Your Cooperative staff will assist you in navigating through the process.

Some generator installations may require the assistance of a professional engineer to help you design the system and certify that it meets applicable codes and standards. Professional services are the responsibility of the customer.

Rules and Regulations for Generator Interconnections

The following documents apply to all new electric generator interconnections that are less than 20 MW and not covered under Net Energy Metering rules:

- ✓ CVEC Schedule SGI, Small Generator Interconnections Other Than Net Metering
- ✓ CVEC Terms and Conditions for Providing Distribution Service
- ✓ CVEC Agreement For Interconnection And Parallel Operation Of Distributed Generation
- ✓ SCC Regulations Governing Interconnection Of Small Electrical Generators, 20VAC5-314

All of these documents are available by contacting the Cooperative's office, or by visiting CVEC's web site at:

<http://www.mycvec.com/solar---wind-power.html>

Level 1 Interconnection Process (20VAC5-314-40)

A generating facility no larger than 500 KW may begin operating after the following requirements are met.

1. Submit a completed Level 1 Interconnection Request Form (Schedule 1 in 20VAC5-314-170) to CVEC with a \$100 processing fee attached.
2. Within 10 business days of receipt, CVEC will notify you if there are any deficiencies in the application. You then have 10 days to provide the additional information needed to process the request.
3. Within 15 days of a complete request, CVEC will evaluate the request and inform you what, if any, utility modifications are required to interconnect the generator. Any modifications will be completed at the expense of the Interconnection Customer.
4. A lockable, utility-accessible, load breaking manual disconnect switch with visible open contacts is required at the point of interconnection.
5. A licensed electrician must certify that the generating facility has been installed in accordance with the manufacturer's specifications as well as all applicable provisions of the National Electrical Code.
6. The vendor of the generation equipment must certify that the equipment is in compliance with IEEE Standard 1547, Standard for Interconnecting Distributed Resources with Electric Power Systems.
7. All protective equipment settings must be inspected by CVEC.
8. The Interconnection Customer must pay the cost of any special metering equipment required.
9. A generating facility larger than 25 KW must meet additional requirements for loading, grounding, and voltage balance.
10. Site control documentation must be submitted to demonstrate ownership of, a leasehold interest in, or a right to develop a site for the purpose of constructing a generating facility.

Levels 2 and 3 Interconnection Request General Requirements (20VAC5-314-50)

1. Submit a complete Levels 2 and 3 Interconnection Request Form (Schedule 4 in 20VAC5-314-170) to CVEC with a \$500 processing fee for a Level 2 review or a \$1,000 processing fee for Level 3 review.
2. Within 10 business days of receipt, CVEC will notify you if there are any deficiencies in the application. You then have 10 days to provide the additional information needed to process the request.
3. Site control documentation must be submitted to demonstrate ownership of, a leasehold interest in, or a right to develop a site for the purpose of constructing a generating facility.

Level 2 Interconnection Process (20VAC5-314-60)

A generating facility no larger than 2 MW, and not qualifying for a Level 1 process, may begin operating after the following requirements are met.

1. Within 15 days of a complete request, CVEC will perform an initial review using standard screens to evaluate loading, fault current, protective devices, line and transformer connections, and network connections.
2. If the interconnection passes the screens, the request will be approved and CVEC will provide the Interconnection Customer with a Small Generator Interconnection Agreement (SGIA) within five business days.
3. If the interconnection fails any screens, CVEC will determine if the system can still be interconnected safely and reliably, or if modifications are required. CVEC will meet with the customer to review options, and if requested, will do one of the following at the customer's expense:
 - a. Perform modifications to the utility system,
 - b. Perform a supplemental review to determine if the generating facility could continue to qualify for interconnection pursuant to the Level 2 process, or
 - c. Continue evaluating the interconnection request, but under the Level 3 interconnection process.

Level 3 Interconnection Process (20VAC5-314-70)

The Level 3 interconnection process is to be used for generating facilities no larger than 20 MW, and not qualifying for a Level 1 or Level 2 process. As needed, a scoping meeting, feasibility study, system impact study, and facilities study will precede the preparation of a Small Generator Interconnection Agreement.

1. Scoping Meeting

A scoping meeting will be held within 10 days of receipt of a complete Interconnection Request Form to discuss technical aspects of the request.

2. Feasibility Study

By mutual agreement of the parties, a feasibility study may be performed at the customer's expense to identify any potential adverse system impacts that would result from the interconnection of the generating facility.

The feasibility study will address circuit breaker ratings, loading, voltage, grounding, and electric system protection for all points of interconnection. A report will be provided within 30 days.

If the feasibility study indicates no potential for adverse system impacts, CVEC will send the Interconnection Customer either a Small Generator Interconnection Agreement or a facilities study agreement, including an outline of the scope of the study and an estimate of the cost to perform the study.

3. System Impact Study

By mutual agreement of the parties, a system impact study may be performed at the customer's expense to identify any electric system reliability issues or impacts that would result if the generating facility were interconnected without project modifications or electric system modifications.

The system impact study will analyze short circuit conditions, stability, power flow, voltage drop, flicker, grounding, protection, and operation. A report will be provided within 45 days.

If the system impact study indicates that the Interconnection Customer needs to perform facility modifications to accommodate the generating facility, a facilities study shall be performed at the expense of the customer.

4. Facilities Study

The facilities study will specify the estimated cost of equipment, engineering, procurement, and construction work needed to implement the conclusion of the feasibility and/or system impact study and to allow the generating facility to be interconnected safely and reliably.

Interconnection Metering and Commissioning Tests

Prior to operation of the generating facility, any special metering necessitated by the use of the facility will be provided by CVEC at the customer's expense.

Commissioning tests of the customer's equipment shall be performed by the customer in accordance with applicable codes and standards, including IEEE 1547.1 "Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems."

Insurance

The Interconnection Customer shall secure and maintain in effect during the term of the agreement liability insurance with a combined single limit for bodily injury and property damage of not less than the amount stated below.

- \$100,000 for generating facilities with rated capacity not exceeding 10 KW.
- \$300,000 for generating facilities with rated capacity not exceeding 500 KW.
- \$2,000,000 for generating facilities with rated capacity not exceeding 2 MW.

Certificates of insurance must be furnished to CVEC prior to the date of interconnection.

Small Generator Interconnection Agreement (SGIA)

Within five business days of transmittal of the final study, CVEC will provide the applicant with an executable SGIA (Schedule 6 in 20VAC5-314-170), which must be signed and returned within 30 days.

The SGIA includes the requirements for operation, inspection, testing, maintenance, billing, payment, construction milestones, liability, insurance, and points of contact for each party.

C. Generators With Capacity Greater Than 20 MW

Generators of more than 20 MW must be interconnected under a separate bilateral arrangement between the Cooperative and the Interconnection Customer.

Summary of Documentation, Fees, and Insurance

FACILITY TYPE	SIZE	FEE	APPLICATION FORMS	CONTRACT	INSURANCE
Not Interconnected	NA	\$0	None	None	None*
Net Energy Metering	Residential ≤ 10 KW	\$50 Inspection	Form NMIN	None	\$100,000
	Residential > 10 KW ≤ 20 KW	\$50 Inspection	Form NMIN	None	\$300,000
	Commercial ≤ 10 KW	\$50 Inspection	Form NMIN	None	\$100,000
	Commercial > 10 KW ≤ 1,000 KW	\$50 Inspection	Form NMIN	None	\$300,000
Interconnected to Utility Power System	≤ 10 KW	\$100	Level 1	CVEC Agreement For Interconnection	\$100,000
	> 10 KW ≤ 500 KW	\$100	Level 1	CVEC Agreement For Interconnection	\$300,000
	500 KW to 2 MW	\$500	Levels 2 & 3	SGIA	\$2,000,000
	2 MW to 20 MW	\$1,000	Levels 2 & 3	SGIA	Case by case basis

*Insurance is not required by the Cooperative but may be needed for the customer's own protection.

APPLICATION FORMS AND INFORMATION

For application forms and additional information, contact your Cooperative engineering staff, or visit these web sites:

Central Virginia Electric Cooperative

<http://www.mycvec.com/solar---wind-power.html>

Virginia State Corporation Commission

<http://www.scc.virginia.gov/pue/rules.aspx>

CVEC Contact:

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