



HARNESSING THE POWER OF RENEWABLES





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HARNESSING THE POWER OF RENEWABLES

KNOW THE FACTS

Contact the electric cooperative before installing a distributed generation system on your property.

Owners of distributed generation, also referred to as alternative energy production facilities (such as solar photovoltaic and wind turbines) are required to notify their utility company, which includes electric cooperatives, of plans to construct, install and operate any system that will be connected to the utility's systems. Utility systems include electric transmission lines, distribution lines or attached equipment. Talk to your co-op about filling out an interconnection application in advance of purchasing or installing any distributed generation equipment.

The electric cooperative will not help cover the costs associated with determining if owning a distributed generation system is a good choice for you.

It is the sole responsibility of the member-owner to determine if owning a distributed generation system is a good investment. Your electric cooperative does not provide financial assistance with the analysis. However, electric co-ops have created this reference information to help members-owners understand the complexity of owning a distributed generation system before making a decision.

If you already have a wind or solar generating facility on your premise, you still need to contact your electric cooperative if you plan to expand your system.

Whenever a system expansion is planned, it's necessary to contact your co-op to ensure all electrical needs can be adequately met and that system reliability and safety are not compromised. In some instances, line upgrades may be necessary to serve the expansion. The system expansion will also need to undergo the same inspection process that is required of a new generation system.

Even if you will be using all of the energy output that you generate with your distributed generation system; you still need to contact your co-op.

No matter the size of the system or the power output, consumers are required to notify their electric cooperative of plans to construct, install and operate any system that will be connected to the cooperative's systems (electric transmission lines, distribution lines or attached equipment). Talk to your co-op about filling out an interconnection application in advance of purchasing or installing any distributed generation equipment. An interconnection agreement is also required prior to operating the system.

You still need the grid, even if you install a distributed generation system.

In order to ensure reliable and uninterrupted power, individual renewable systems typically must be balanced with a continuous source of dependable power from central station generation. It's rare for individuals who want continuous and reliable electricity to be completely off the grid. Backup generation in the form of a gas-powered generator, battery bank or some other storage technology is needed if the consumer desires a continuous supply of power but is no longer on the grid. Backup systems can be more expensive and less reliable than currently available central station generation provided by an electricity provider using the grid.

An interconnection agreement is required between you and your electric cooperative.

To ensure your safety and that of your fellow cooperative member-owners, you must notify your co-op if you intend to install a distributed generation system and an interconnection agreement must be in place. Whenever a generating resource is connected and providing power, your co-op must be aware of the system so that line personnel and other employees are not put in harm's way. There are a number of safety mechanisms that must be taken into account and put into place with member-owned generating facilities.

The grid does not act as a battery for my excess kilowatt-hours.

The grid does not act as a battery for excess energy because it is not capable of storing electricity in a manner that is cost competitive with other technologies.

The co-op is not responsible for the maintenance of the member-owned distributed generation system.

Your electric co-op does not have responsibility for the maintenance of member-owned distributed generation systems. The member-owner who owns the resource is responsible for all necessary maintenance and repair investments and activities.

Owning and operating a distributed generation system on your property presents additional safety issues for the cooperative.

Each type of generating source has specific requirements. For example, in the case of a rooftop solar system, the International Fire Code requires a construction permit, specific signage and markings, properly spaced access points, and smoke ventilation, just to name a few. These measures are to ensure the safe and reliable operation of the system and to protect member owners and employees who interact with the power grid. If linemen are not aware of an interconnected system, they could be at risk of serious injury when working on the distribution system. These requirements also protect local safety personnel by ensuring the appropriate system notification may be required to prevent injury.

Additional insurance may be required for your distributed generation system.

In most states, distributed generation owners are required to provide proof of general liability insurance as part of the interconnection agreement. Check with your electric cooperative for the specific insurance requirements needed for the system you are considering.

Solar generation production does not completely match the cooperative's peak demand periods.

Peak production for solar generation is typically between 2-4 p.m. and consumer electric use generally peaks in the early evening, which means there is a mismatch between energy production and energy consumption. In order to maximize the potential benefits of distributed generation, it is important to size the system properly and invest in technology that provides the most output during your peak-use period.

Your solar generation system does not produce the same amount of energy on a cloudy day as it does on a sunny day.

Solar energy production is at its highest on a sunny day; cloudy skies can significantly impact production. Research shows that production may drop 60-70 percent or more on a cloudy day versus a mostly sunny day.

Your electric cooperative supports a balanced approach to renewable energy production.

Your electric cooperative supports renewable energy and responsible environmental policies that balance the needs of the environment while providing affordable, safe and reliable power. Hoosier Energy, your electric cooperative's power supplier, has invested millions of dollars into renewable resources, such as wind, solar, hydro, and landfill methane gas. With a goal to obtain 10% of its energy from renewable resources by 2025. Recently, Hoosier Energy and its 18 member cooperatives have invested in building 10MW of solar projects throughout southern Indiana. Each solar facility produces enough power in a year to serve 150 average cooperative homes.

IF YOU'RE THINKING ABOUT INSTALLING A RENEWABLE ENERGY GENERATION SYSTEM, MAKE SURE YOU HAVE ALL THE FACTS FIRST.

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QUESTIONS TO ASK A POTENTIAL SOLAR PANEL INSTALLER

IMPLEMENT ENERGY EFFICIENCY

Completing a thorough energy efficiency audit is an important first step when considering distributed generation (DG). By implementing energy efficiency measures before installing a distributed generation system you save money by reducing your overall energy consumption, and reduce the size of the distributed generation system you'll need to meet your energy needs. Many energy efficiency projects have a quicker payback than certain DG installations.

DO YOUR HOMEWORK BEFORE YOU WRITE THE CHECK

If you are considering investing in a distributed generation system, talk to your electric cooperative before you begin. Also talk to credible, reputable and skilled professionals who are knowledgeable in distributed generation systems. They can direct you to additional resources that will help you understand the economics of a distributed generation system, including the type of renewable energy technology best for your property, financing, incentives, insurance requirements and more.

In addition to professionals, ask for the advice of others who have installed a DG system to learn what they like about their system or what they wish they would have done differently.

KNOW YOUR CO-OP'S RATE STRUCTURE AND INTERCONNECTION AND PURCHASED POWER POLICIES

Your local not-for-profit energy provider can help you understand the rate structure your services fall under and the types of charges likely to be incurred, and how you may be compensated for the excess energy you do not use that is generated by your distributed generation system.

ANALYZE YOUR ELECTRIC LOAD AND UNDERSTAND THE DG SYSTEM'S CAPABILITIES

A thorough examination of your electricity needs will help you determine the size and type of the system necessary. Record how your energy use fluctuates throughout the day, both seasonally and over the year. Research when various distributed generation systems produce peak energy and compare that information to your current and expected energy use.

You'll most likely still need power from a centralized energy grid. Distributed generation is intended for supplemental power to meet your own energy needs.

DETERMINE THE COSTS UPFRONT

Most electric co-ops do not install or maintain member-owned distributed generation systems.

You will be responsible for the initial costs to install the system and ongoing maintenance and repair costs. Doing your homework before investing in a system will help you understand costs involved, such as installation and interconnection costs, insurance, taxes, as well as incentives and tax credits. Your research will help determine if a distributed generation system is economical for your energy needs.

RESEARCH POTENTIAL INCENTIVES AND TAX CREDITS

Financial incentives, such as the Investment Tax Credit (ITC), may be available to offset your investment costs. We encourage you to talk with a tax advisor and your perspective vendors to learn more. Incentives are often driven by laws or policies, have expiration dates, and can vary by type and size of system, whether it is for residential or commercial/ industrial use, and other factors.

The Database of State Incentives for Renewables & Efficiency (www.dsireusa.org) is one source of information on incentives and policies that support renewables and energy efficiency in the U.S.

UNDERSTAND RESPONSIBILITIES

Installing a distributed generation system requires that certain responsibilities are met by all parties involved with the process.

For example, the owner of the distributed energy system is responsible for obtaining the proper equipment and ensuring that all requirements of the electric co-op's interconnection agreement are met, including paying any necessary costs. Local and/or state officials are responsible for conducting safety inspections, but the owner of the distributed generation system must notify the local and state officials in order to set this in motion. Once all interconnection requirements are met and the safety and integrity of the system meet all necessary criteria, then the cooperative is responsible for the final stages of interconnection. Ongoing maintenance and system repairs are the responsibility of the generation system owner.

KNOW SAFETY REQUIREMENTS

Your electric cooperative provides electricity when your distributed generation system is not producing sufficient energy to meet your needs, which keeps member-owners connected to the grid.

Because of this connection, distributed generation owners must work with their co-op to meet their requirements to keep the grid reliable and safe.

All interconnection and safety requirements must be met prior to operating a distributed generation system in parallel with your co-op's electric distribution system.

This is necessary to protect other member-owners, cooperative employees, public safety personnel, and the general public from risks that could result from the improper installation of distributed generation.

CHOOSE A REPUTABLE VENDOR

It's important to find a reputable installer who will size the system properly and give you realistic expectations. Ask for references, check online consumer reviews, and ask for third-party input from credible resources.

Refer to the North American Board of Certified Energy Practitioners (NABCEP) at NABCEP.org to locate certified installers and practitioners in your area.

KEEP THOROUGH RECORDS

Retain all data and research that you gather as well as information that is provided by your electric cooperative, vendors and other credible third-party sources. If you proceed with a distributed generation system, you will want to track and compare actual system performance with expected performance based on vendor information.

COST AND ENERGY

- What is the total installed cost of the system?
- Are you considering a roof mount or ground mount system? What are the differences in cost, maintenance, and space? How much of your energy use would the solar system cover?
- How much would your monthly energy bills be after installation?
- How long is the payback period on the solar system? What are the key assumptions associated with the payback that may impact that result?
- How will solar affect your homeowner's insurance?

HARDWARE AND INSTALLATION

- If your energy use changes, will you be able to add more panels later?
- Will you need a new roof to install and utilize these solar panels? Will your roof be able to bear the weight of the panels? If these panels or the installation damage your property, who is responsible?
- In which country are the solar panels and inverters made?
- What kind of warranties do the solar panels and inverters have? When does equipment typically need to be replaced?
- How long will the installation take?

VENDOR VERIFICATION

- When was the company established and how much solar has it installed to date? (Ask for references.)
- Does the company have a standard insurance certificate with adequate general liability coverage of \$1 million or more? (Ask to see it)
- Does the company have professional liability insurance? (Ask to see it)
- Are the solar installers North American Board of Certified Energy Practitioners (NABCEP) Solar Photovoltaic (PV) Electric trained and certified?
- Do they have a licensed professional engineer and master electrician on staff to review and approve drawings, obtain permits, and supervise electrical work? Will they handle that paperwork?
- Are they accredited with the Better Business Bureau? If so, what is their rating?
- Will they complete all of the paperwork associated with financing, tax credits, and/or grants? Does that cost extra?
- Do they work with any affiliated companies or sub-contractors?
- Do they offer any warranties or guarantees on their installation work?

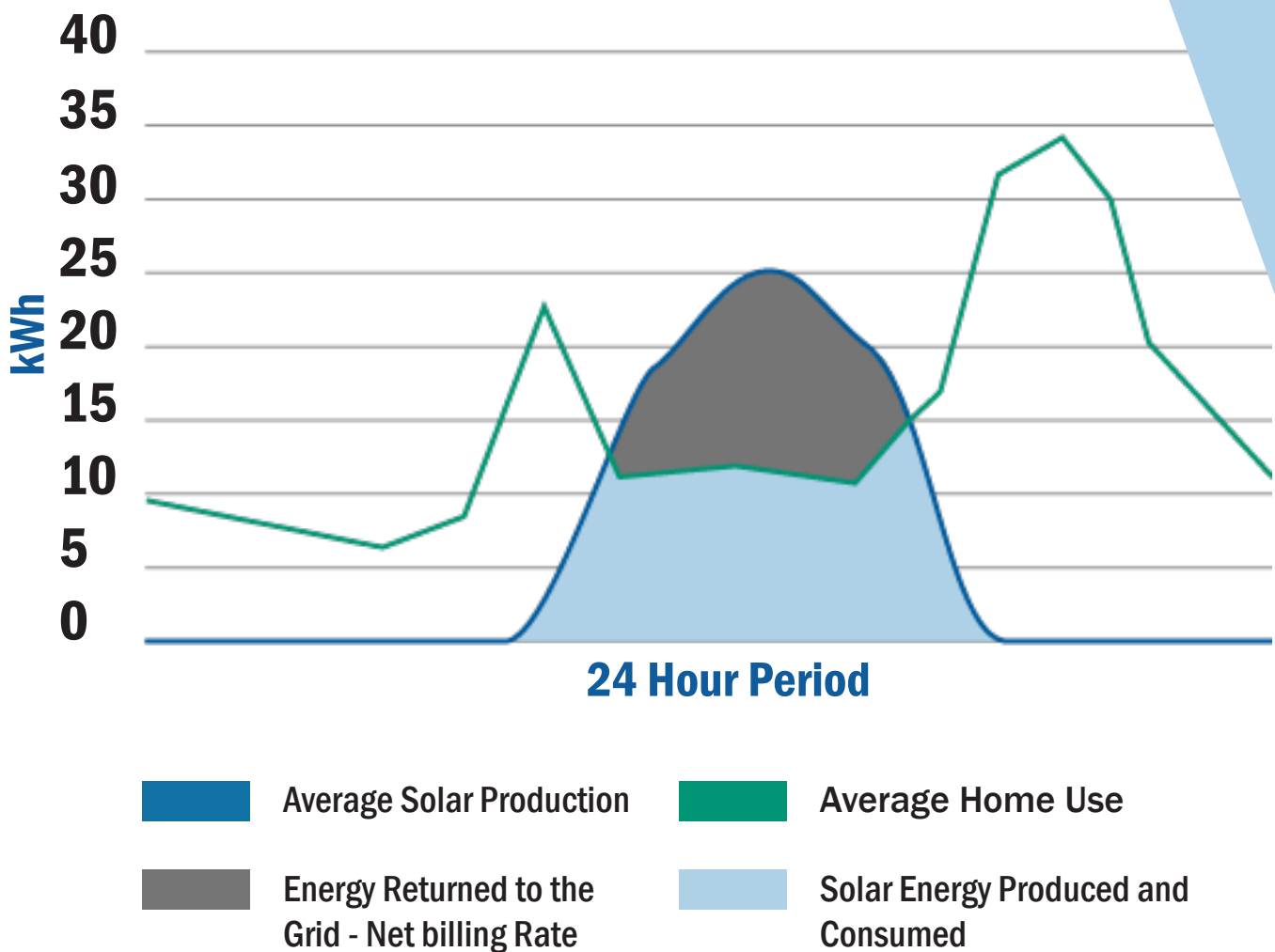
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CONSUMER COMPENSATION

After careful consideration, SEIREMC has established compensation levels for consumer-owned renewable energy that ensures equity for all member-consumers. It is important that compensation be fair to both those who choose to interconnect a distributed generation device and those who do not. The payment structure is a net billing approach as seen below.

- The member-consumer avoids paying retail rate for any energy produced and consumed.
- Energy that is produced and returned to the grid is compensated at a net billing rate.

Energy produced and used by the consumer, shown in light blue in the chart below, would be an energy offset at your retail rate. The area shaded in grey is energy returned to the grid that would be compensated at the net billing rate cost rate.



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GLOSSARY OF TERMS

Items with an asterisk (*) are terms defined by the U.S. Energy Information Administration (EIA).

BACKFEED

When excess electric power is being produced from a distributed generation system into the local power grid, power flows in the opposite direction from its usual flow.

BACKUP GENERATOR

A generator that is used only for test purposes, or in the event of an emergency, such as a shortage of power needed to meet customer load requirements.*

BASELOAD GENERATION (BASELOAD PLANT)

Generation from a plant, usually housing high-efficiency steam-electric units, which is normally operated to take all or part of the minimum load of a system, and which consequently produces electricity at an essentially constant rate and runs continuously.*

CENTRAL STATION GENERATION

Production of energy at a large power plant that is transmitted through infrastructure to a widely distributed group of users.

COAL

A readily combustible black or brownish-black rock whose composition, including inherent moisture, consists of more than 50% by weight and more than 70% by volume of carbonaceous material.*

COGENERATION

The production of electrical energy and another form of useful energy (such as heat or steam) through the sequential use of energy.*

COMMISSIONING TEST

A highly specialized activity where a power installation is tested to ensure it meets exacting standards through a set of engineering techniques and procedures to check, inspect and test every operational component of the project, from individual functions, such as instruments and equipment, up to complex amalgamations such as modules, subsystems and systems.

CONSUMPTION (ALSO ENERGY CONSUMPTION)

The use of energy as a source of heat or power or as a raw material input to a manufacturing process.*

COST OF SERVICE

A ratemaking concept used for the design and development of rate schedules to ensure that the filed rate schedules recover only the cost of providing the electric service at issue.*

DISTRIBUTED GENERATOR

A generator that is located close to the particular load that it is intended to serve. General, but non-exclusive, characteristics of these generators include: an operating strategy that supports the served load and interconnection to a distribution or sub-transmission system (138 kV or less).*

DISTRIBUTION

The delivery of energy to retail customers.*

ELECTRICITY GENERATION

The process of producing electric energy or the amount of electric energy produced by transforming other forms of energy, commonly expressed in kilowatt hours (kWh) or megawatt hours (MWh).*

ELECTRIC POWER GRID

A system of synchronized power providers & consumers connected by transmission & distribution lines and operated by one or more control centers. *

ENERGY

Energy has several forms, some of which are easily convertible and can be changed to another form useful for work. Most of the world's convertible energy comes from fossil fuels that are burned to produce heat that is then used as a transfer medium to mechanical or other means in order to accomplish tasks. *

ENERGY DEMAND

The requirement for energy as an input to provide products and/or services.*

ENERGY EFFICIENCY

A ratio of service provided to energy input (e.g., lumens to watts in the case of light bulbs). Unlike conservation, which involves some reduction of service, energy efficiency provides energy reductions without sacrifice of service. May refer to the use of technology to reduce the energy needed for a purpose or service.*

ENERGY EFFICIENCY, ELECTRICITY

Refers to programs that are aimed at reducing the energy used by specific end-use devices and systems, typically without affecting the services provided. These programs reduce overall electricity consumption (reported in megawatt hours), often without explicit consideration for the timing of program-induced savings. Such savings are generally achieved by substituting technologically more advanced equipment to produce the same level of end-use services (e.g. lighting, heating, motor drive) with less electricity. *

ENGINEERING STUDY

A study conducted by the electric cooperative that will indicate the equipment needed for the interconnection of a distributed generation system; typically, this study will address technical and safety requirements.

GRID

The layout of an electrical distribution system.*

IEEE

Institute of Electrical & Electronics Engineers

INTERCONNECTION

Two or more electric systems having a common transmission line that permits a flow of energy between them. The physical connection of the electric power transmission facilities allows for the sale or exchange of energy.*

INTERCONNECTION AGREEMENT

A legal contract for the connection of the distributed generation facility to the cooperative's lines, specifying the location, size, cost, manner of payment, terms of operation and respective responsibilities of the cooperative and the distributed generation member-owner.

INTERCONNECTION APPLICATION

A document submitted to the cooperative that provides information for a proposed distributed generation facility and allows the cooperative to assess any potential impacts and ensure all requirements are met.

INTERCONNECTION COSTS (DG)

The reasonable costs of connection, switching, metering, transmission, distribution, safety provisions and administrative costs incurred by the cooperative directly related to the installation & maintenance of a member's distributed generation facility.

INTERMITTENT LOAD

The range from base load to a point between base load and peak. This point may be the midpoint, a percent of the peak load, or the load over a specified time period.*

INTERMITTENT RESOURCE

An electric generating plant with output controlled by the natural variability of the energy resource rather than dispatched based on system requirements. *

ISOLATION DEVICE

A readily accessible, lockable, visible-break switch located between the distributed generation facility and its interface to the cooperative's electric facilities.

KILOWATT HOUR (KWH)

A measure of electricity defined as a unit of work or energy, measured as 1 kilowatt (1,000 watts) of power expended for 1 hour. One kWh is equivalent to 3,412 Btu.*

LOAD

An end-use device or customer that receives power from the electric system.*

METHANE

A colorless, flammable, odorless hydrocarbon gas which is the major component of natural gas. It is also an important source of hydrogen in various industrial processes. Methane is a greenhouse gas.*

NET METERING

A billing mechanism that credits renewable energy system owners for the electricity they add to the grid, at a retail rate.

NET BILLING

A billing mechanism that credits renewable energy system owners for the electricity they add to the grid, at the utility's wholesale rate.

OUTPUT

The amount of power or energy produced by a generating unit, station, or system.*

PEAK DEMAND, PEAK LOAD

The maximum load during a specified period of time.*

PHOTOVOLTAIC (PV)

Energy radiated by the sun as electromagnetic waves (electromagnetic radiation) that is converted at electric utilities into electricity by means of solar (photovoltaic) cells or concentrating (focusing) collectors.*

PURPA

Public Utility Regulatory Policies Act (PURPA) of 1978. One part of the National Energy Act, PURPA contains measures designed to encourage the conservation of energy, more efficient use of resources, and equitable rates. Principal among these were suggested retail rate reforms and new incentives for production of electricity by cogenerators and users of renewable resources. *

QUALIFYING FACILITY (QF)

A cogeneration or small power production facility that meets certain ownership, operating, and efficiency criteria established by the Federal Energy Regulatory Commission (FERC) pursuant to the Public Utility Regulatory Policies Act (PURPA).*

RELIABILITY

A measure of the ability of the system to continue operation while some lines or generators are out of service. Reliability deals with the performance of the system under stress.

RENEWABLE ENERGY

Energy resources that are naturally replenishing but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Renewable energy resources include biomass, hydro, geothermal, solar, wind, ocean thermal, wave action and tidal action.*

SOLAR ENERGY

The radiant energy of the sun, which can be converted into other forms of energy, such as heat or electricity.*

STORAGE CAPACITY

The amount of energy an energy storage device or system can store.*

SYSTEM PROTECTION EQUIPMENT

Equipment that protects electrical power systems from faults through the isolation of faulted parts from the rest of the electrical network. The goal is to stabilize the power system by isolating only the components that are under fault, while leaving as much of the network as possible still in operation.

TRANSMISSION SYSTEM

An interconnected group of lines and associated equipment for the movement or transfer of electric energy between points of supply and points at which it is transformed for delivery to customers or is delivered to other electric systems.*

WIND ENERGY

Kinetic energy present in wind motion that can be converted to mechanical energy for driving pumps, mills and electric power generators.*



CONTACT INFORMATION

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Learn more at www.seiremc.com/solar