Iowa Association of Electric Cooperatives
A Touchstone Energy® Cooperative

Distributed Generation: Frequently Asked Questions

1) What is distributed generation (DG)?

Generating technologies located close to where the electricity is being used that are connected to the electric power grid and serve as supplement to or an enhancement of the traditional electric power system. The technologies of interest today for member-owners primarily include solar and wind generation and energy storage solutions. Distributed generation allows member-owners to produce some or all of the electricity they need.

Renewable energy distributed generation systems only produce power when their energy source, such as wind or sunlight, is available; this is called intermittent power. Due to this intermittency of the power supply from distributed generation, there often are times when the member-owner still needs to receive electricity from the cooperative's grid. When the distributed generation system produces more power than the member-owner can consume at that time, the excess power is sent onto the cooperative's grid. This reduces the overall amount of electricity that the cooperative needs to supply at the time the distributed generation system is producing power.

Iowa's electric cooperatives also define distributed generation as member-owned generation that meets the definition of a Qualifying Facility under the Public Utilities Regulatory Policies Act (PURPA) or an Alternate Energy Production (AEP) Facility as defined in Iowa Code §476.42.

2) What are the primary differences between central station generation and distributed generation?

Central station generation produces electricity at a power plant, which is transmitted through the interconnected grid infrastructure to a widely distributed group of users, which provides significant cost efficiencies. Central station generation often uses a diverse mix of fuel sources, including coal, oil, natural gas, nuclear, hydro, wind, solar and biomass. Central station generation provides diversity in system size, optimal operation times for maximum efficiency, and geographic location. Base load central station generation resources (e.g. typically coal, oil, nuclear and natural gas) are designed to and can operate 24/7 and can also be dispatched as needed to meet load, regardless of factors such as weather.

Distributed generation is generally smaller in size than central station generation and located on or near a consumer's source of energy needs. Although technology is changing, most renewable energy distributed generation sources are unable to meet the dispatchability requirements of the grid. Currently, not all distributed generation is able to completely serve the consumer loads without relying on utility based backup.

3) How does distributed generation affect the current energy model?

For decades, power from central station generation has been and continues to be the most reliable and affordable way to provide power to large numbers of consumers. When consumers only receive power from centralized sources, cooperative member-owners benefit from economies of scale and the cooperative can adequately plan for future energy demand and have adequate generation available to meet those needs. Distributed generation, while supported by electric cooperatives, introduces many new variables that need to be continuously factored into energy planning and delivery. Some of those factors include, but are not limited to, supply and demand forecasts, the rate structure to ensure non-discriminatory rates and that all member-owners pay their fair share for the costs associated with delivering and receiving power from the grid, and various distributed generation inspection protocols to ensure the continued safe operation of the grid.

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4) What is my co-op's position with respect to distributed generation?

Iowa's electric cooperatives support distributed generation as long as it is developed and installed in compliance with both the respective cooperative's policies and local, state and federal laws and regulations.

5) Is distributed generation right for me?

It is solely the 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, we will assist you with finding appropriate and credible resources to help you with the decision-making process. Before determining if distributed generation is right for you, you'll want to determine your goals (e.g. environmental stewardship, serving a percentage of your energy demand, etc.), evaluate the type and size of distributed generation desired, understand your economics, and investigate and understand all applicable requirements and regulations.

6) Should I invest in energy efficiency improvements first?

Yes! Completion of a thorough energy efficiency audit is an important precursor to considering and understanding the economics of distributed generation for you. Implementing energy efficiency measures in advance of installing a renewable energy system can save you money by reducing your overall energy or water consumption, which subsequently reduces the size of the distributed generation system you'll need to meet your energy needs.

7) What type (wind, solar, etc.) and size of generation system should I choose?

Choosing the size of a distributed generation system requires thorough research and analysis of your daily and annual energy use and a determination as to whether you've maximized energy efficiency options for your property. The energy use analysis will indicate what time of day you are using the most energy and the profile of your usage across all hours. Not only will this information allow you to size your system according to your energy consumption needs, it also will show what system will be most suitable. For example, if your peak energy usage is 6-8 p.m., a solar system may not be the best choice as solar energy generation typically peaks earlier in the day. Factors such as your geographic location, city and county codes and zoning requirements, and overall system economics will be important considerations in your decision-making process. You also should understand your cooperative's policies for purchasing the power you don't consume if you have excess generation.

8) What is the process of interconnecting distributed generation?

Planning for a home distributed generation system is a multistep process that begins with talking to your electric cooperative, and requires significant analysis and fact-finding, and then careful evaluation of the information that you learn in the process. If you are considering investing in and potentially installing a distributed generation system, it's important that you follow these key steps: 1) Identify and implement energy efficiency opportunities. 2) Schedule a meeting with your co-op. We can help you to understand interconnection requirements and point you in the right direction for credible resources that can further assist with the analysis process. 3) Analyze your electric loads. 4) Determine applicable codes. 5) Identify and discuss your options with credible resources and contractors. 6) Schedule a follow-up meeting with your co-op.

9) What is an interconnection agreement, and does my co-op require one?

An interconnection agreement is a legal contract for the connection of the distributed generation facility to the cooperative's grid, specifying the location, size, cost, manner of payment, terms of operation, and respective responsibilities of the cooperative and the distributed generation facility owner. To ensure your own safety and that of your fellow cooperative member-owners, you must notify your electric co-op if you intend to install a distributed generation system and under Iowa law, an interconnection agreement must be in place. With any type of distributed generation system, whether cogeneration or renewable, maintaining the safety, stability and reliability of the overall grid is of the utmost priority.

10) What are my responsibilities when owning a distributed generation system?

As the individual owner of the distributed generation system, you will be responsible for the initial upfront costs to install the system as well as ongoing maintenance and repair costs. The owner of the distributed energy system is responsible for obtaining the proper equipment and ensuring that all requirements are met of your cooperative's interconnection agreement as well as applicable state, local and federal codes. In addition, you will be responsible for paying necessary costs associated with interconnection and operation of the system.

11) What are the co-op's responsibilities?

Once all interconnection requirements are met and the safety and integrity of the system meet all necessary criteria, then your co-op is responsible for the final stages of interconnection. Ongoing maintenance and system repairs are the responsibility of the generation system owner.

12) What are the State of Iowa's responsibilities?

The State of Iowa will conduct safety inspections to ensure the system is operating safely and adheres to all applicable regulations.

13) What questions should I ask a vendor (using solar panels as the example)?

During your research, many questions will be identified that you should ask a vendor including:

- What is the total installed (turnkey) cost of the system?
- How much money is due upfront, and what is the schedule of payments?
- If my energy usage changes, will I be able to add more panels later?
- Do I need a new roof now in order to install? Is my roof suitable to carry the additional live and dead load forces that the solar array will exert?
- When was your company established and how much solar has it installed to date? Can your company provide a list of the projects and references for them?
- Is your company affiliated with other parties to deliver the installation and who are they?
- Does your company have a Standard Insurance Certificate with adequate General Liability coverage of $1 million or more? *(Ask to see it)*
- Does your company have Professional Liability Insurance? *(Ask to see it)*
- Does your company carry Workers Compensation? *(Ask to see it)*
- Do you have the ability to cover me as an "Additional Insured"?
- Are your solar installers North American Board of Certified Energy Practitioners (NABCEP) Solar Photovoltaic (PV) Electric trained and certified?
- Do you have a licensed Iowa Professional Engineer on staff to review and approve drawings for submission to city/county building code and fire department officials?
- Are you accredited with the Better Business Bureau? If so, what is your rating?
- In which country are the solar panels and inverters you are selling made?
- Will the company honor your manufacturer's multiyear performance warranty?
- Does the company have a Master Electrician on staff to obtain the required electrical permits and to supervise the electrical work for your project? *(Ask to see the certificate)*
- Is your solar installer company a Licensed Electrical Contractor which is required to install Solar Electric Systems? May I see your company's license?
- Who will be working on my roof, and how much experience do they personally have installing solar?
- How does your company handle it when you get busy? Do you work with sub-contractors?
- How long will the installation take?
- Will the age or type of my roof affect the cost of installation?
- How will installation affect my roof? Will it create leaks? What if it does create leaks, are you then responsible for repairs?
- If I'm planning on re-doing my roof, should I install panels before or after?
- How much of my energy usage would my solar system cover?
- How much would my monthly energy bills be after installation? From you and from my cooperative?
- How long would my payback period be on my solar system? What are the key assumptions associated with my payback that may impact that result?
- How will solar affect my homeowner's insurance?
- Will you complete all of the paperwork association with getting the permits and financing?

Also refer to the Iowa Utilities Board's checklist found in the *Consumer Informational Guide for On-Site Generation* at: *https://iub.iowa.gov/distributed-generation*

14) What type of records should I keep?

You should keep records of all of your research and document the answers you receive to all of your questions. It's also important to maintain information about expected system performance and promises made by the vendor. Electric usage records should be kept for at least a year prior to installation and each month following installation for comparison purposes so you can monitor your savings.

15) What if the vendor that I choose goes out of business?

This is an important question to ask your vendor and other resources such as the Better Business Bureau.

16) What are the distributed generation installation and operating costs?

Many factors will impact the cost to install distributed generation and includes things such as, type and size of system; construction, maintenance and installation fees; interconnection fees, such as line upgrades, isolating devices and system protection equipment; interest rates for loans; retail electric rate; cooperative's avoided cost of generation; and insurance. The engineering study that your co-op conducts as part of the interconnection process will determine what equipment is necessary for interconnection.

17) What tests will be needed to ensure the system is operating properly?

Your electric co-op will conduct a commissioning test to ensure the system is operating properly. This is a highly specialized activity where a power installation is tested by a trained engineer to exacting industry standards. The test will verify that the system has all of the needed protective and interconnection equipment and can operate properly and safely.

18) Who conducts the necessary inspections?

Local and/or state officials conduct safety inspections.

19) Should I buy or lease?

As is the case with other major purchases, buying and leasing options have different benefits and those benefits vary depending on your financial situation and purchasing goals. By doing your homework, understanding the economics of the system, and assessing the pros and cons of both options, you can arrive at an informed decision that is best for your individual situation.

20) The vendor has described a lease arrangement in which they own the system and I simply pay them a monthly fee for system output. Is that allowed in Iowa?

Yes. However, under federal and Iowa law, our obligation is to buy from the owner of the distributed generation system as long as it meets the requirements of a qualifying facility as defined by the Public Utility Regulatory Policies Act of 1978 (PURPA).

21) If I lease, who is responsible for maintenance?

Information about responsibility for system maintenance should be covered early on in your discussions with the vendor and be documented within the lease agreement entered into with the company providing the equipment.

22) What kind of maintenance costs should I anticipate?

Maintenance costs will vary depending on many things, such as the size and type of system; whether the generation unit is new, used or leased; and weather impacts. A reputable vendor should outline these cost assumptions when you are considering investing in a distributed generation system.

23) Are there state or federal incentives or tax credits?

The Database of State Incentives for Renewables & Efficiency (*www.dsireusa.org*) is one source of information on state and federal incentives, tax credits and policies that support renewables and energy efficiency in the U.S. The site features an interactive map, which allows users to click on a state to see a comprehensive listing of federal and state incentives, credits, exemptions, grants, loans and rebates for residential and commercial/ industrial projects and programs.

24) What is net metering service?

"Net metering service" means service to an electric consumer under which electric energy generated by that electric consumer from an eligible on-site generating facility and delivered to the local distribution facilities may be used to offset electric energy provided by the electric utility to the electric consumer during the applicable billing period.

25) How does net metering impact the entire utility system?

Due to current utility and cooperative rate structures that were designed with the concept of consumers always using the utility's central station services, net metering, as structured today, is essentially a cost-shifting mechanism that provides a subsidy to the owner of the distributed generation system. This subsidy is a direct result of rate structure issues that force the non-distributed generation owning member-owners of the cooperative to cover the cost of the subsidy rather than using a federal- or state-funded incentive program to offer such subsidies. Policymakers across the U.S. are examining the concept of net metering to determine if it's sustainable concept. A primary challenge with net metering and an increasing number of distributed generation systems is the gap that it creates in receiving the necessary funds to maintain a safe and reliable power grid. Under the current design, member-owners who receive the benefit of net metering may not be paying their fair share of the costs necessary to construct, operate and maintain the grid so that they can rely on the grid when their distributed generation is not producing electricity.

26) What are my insurance needs?

In accordance with Iowa law, all distributed generation owners are required to provide proof of some type of general liability insurance as part of the interconnection agreement. For facilities of less than 1 MW, homeowner's insurance is referred to by the rules as one acceptable form of general liability insurance without any specific minimum amount of coverage.

27) What happens when my DG system fails or there is a power outage?

Typically if there is a power outage, the distributed generation system will automatically disconnect from the grid and may shut down if grid power is necessary for it to function. If the distributed generation system was allowed to remain in-service, it could backfeed and energize your cooperative's lines. This would present a serious danger to line crews who would expect the power lines to be de-energized so that repairs could be made to safely and efficiently restore service. If your DG system fails, your power will come from the grid through the co-op until you are able to restore the DG system to service.

28) If there is a catastrophic event, who pays for the loss?

As the owner of the DG system you are responsible for all costs or insurance claims associated with the system. Your electric cooperative does not have financial responsibility for your system.

29) If there are injuries to the public or crew during the installation process, who is responsible?

Your attorney can provide more information on liability. It is the responsibility of the property owner to obtain necessary insurance. This is an important question to pose to your installer to ensure they also have insurance.

30) What if I decide to remove the system, who is responsible?

If you are the owner of the distributed generation system then you will be responsible for removal of the system.

31) Are additional resources available to assist with the decision-making process?

In January 2015, the Iowa Utilities Board released a consumer guide intended to aid residential and small business consumers who are considering installing distributed generation, such as wind, solar, biomass, or other technologies on their property.

At the outset of your process, it's important to talk to your electric co-op's member services personnel. You also should consult with experts in renewable energy and distributed generation who can advise you of additional resources; help you to understand the economics of a distributed generation system; help you to determine if a distributed generation system is right for you and what type of renewable energy technology would be best for your property; discuss financing, potential tax incentives and financial incentives; and discuss other requirements such as insurance.

When property owners are considering any type of home improvement or construction project, the Iowa Attorney General provides several recommendations at *http://bit.ly/1C7qMfR* to help to ensure a successful project completion. These recommendations also are applicable for member-owners who are considering installing a distribution generation system on their property.

After you complete these steps, schedule a follow-up meeting with your co-op. Staying engaged with us during all aspects of considering installation of distributed generation is critical to the success of the project. Our priority is to help you make informed decisions and to do everything possible to ensure the safety of all parties involved and that all interconnection requirements are met.

>> For more information and resources on distributed generation systems, we encourage you to download the Iowa Utilities Board's *Consumer Informational Guide for On-Site Generation* at: *https://iub.iowa.gov/distributed-generation*

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