

Understanding Energy

Energy Pyramid Fact Sheet

Net Metering Fact Sheet

Off-Grid Living Fact Sheet

Green Building Fact Sheet

Understanding Your Energy Consumption Fact Sheet

Sources and Uses Fact Sheet

Carbon and Energy Fact Sheet

Importance Scale Survey

For more energy information, go to <http://energy.tennessee.edu>.

Net Metering Electrical Energy Generators

Nearly all households pay utility companies monthly for electricity service. As national energy consumption and issues of energy independence are increasingly being discussed, many are considering methods for reducing monthly bills by generating energy themselves. This is typically accomplished by installing a renewable energy generation system, such as a small wind or solar system, but may include a host of other technologies as well.

Interconnecting a renewable energy generator, while remaining connected to the local electrical utility, and receiving incremental credit for energy produced is referred to as net metering. Many states have enacted legislation to encourage net metering. In Tennessee, net metering is not an option due to contracts between the Tennessee Valley Authority (TVA) and local utilities. However, a dual system metering is available.

Net metering involves installing a special electric meter or reprogramming an existing meter so that electrical flow can be measured in both directions. Traditional electric meters only measure electricity flowing from the utility company to the customer. Because net metering customers are generating electricity in addition to using electricity, the meter must be able to measure the flow of electricity both from the consumer and the utility company. Depending on the type of meter currently installed, this may involve the utility company reprogramming the existing meter or installing a new meter. In Tennessee, two meters are used. One measures the power used and the other measures how much power is supplied to TVA's Green Power Switch program. It is important to contact TVA's Green Power Providers program early in the process, as they accept a limited number of providers within certain time frames. More complete information is available on TVA's Green Power Providers web page at www.tva.com/greenpowerswitch/providers/index.htm.

A net metering customer's production and use of electricity will not be equal most of the time. When their production of electricity is less than their use, additional electricity is supplied by the utility company through the electrical grid. Alternatively, when a customer generates more electricity than they are using, excess electricity is transferred to the electrical grid and is used by other customers. At the end of the billing period, the net metering customer's electrical production is subtracted from their total electrical consumption. The customer is billed only for the net amount (this is why the arrangement is referred to as net metering) of electricity consumed. In some situations a customer may produce more electricity than they use, in which case the excess amount may be carried over to the next billing period or transferred to the utility company at a price (often zero) determined in the net metering contract.

The contract provided by the utility company determines how often the account is "true-up." The true-up period is the point in time when the difference between production and consumption of electricity is computed. True-up periods are typically either monthly or annual, depending on the utility. Arrangements with the utility company will also determine the price of any electricity purchased from the utility company and the price at which any excess power will be purchased by the utility company.

Advantages

Net metering offers several potential benefits. Net metering projects may provide a positive financial return for system owners. In these cases, the value of the reduction in monthly electric bills is larger than the cost of installing and maintaining the system. Some customers value knowing that some of the electricity they are using is provided by a renewable, local or an alternative generating resource. Other customers value being somewhat self-sufficient in their electrical usage.

Concerns

Opponents of net metering often cite these issues. First, net metering has the potential to reduce revenue for utility companies. Customers who reduce their electrical bills also reduce their payments to the utility companies that help pay for fixed costs. Some utilities, especially smaller utilities with large service areas, express concerns that the loss of revenue from net metered customers does not reduce the cost of operation or service to those customers. To date, this has not been a significant issue due to the limited number of net metering customers. Second, some opponents question the return on investment for net metering systems. Most renewable energy generation systems require many years to provide a positive financial return. While some look at non-monetary values in renewable energy generation, those who look to the current return on investment as a measure of the project's value may argue that there are other means of making changes to energy use that have faster payback.

What is the Difference Between a Kilowatt (kW) and a Kilowatt hour (kWh)?

In simple terms a “watt” is a measure of power, while a “watt-hour” is a measure of energy. Every 1,000 watts equals 1 kilowatt. Most electrical appliances consume energy in watts, which are a measure of energy conversion. A lightbulb with a power rating of 60 watts will use the energy of 60 watt-hours if it is turned on for one hour. In the case of renewable energy generators, the power generator is measured in terms of its power, or kilowatts, but its actual generation is measured in kilowatt-hours. A kilowatt-hour is the amount of energy equivalent to a steady power of 1 kilowatt running for one hour. The electrical meter, which is also called a kilowatt-hour meter, tracks electrical consumption and customers are billed each month by the utility for the number of kilowatt-hours used during that billing period. According to the U.S. Department of Energy, the average Tennessee household consumed 1,217 kilowatt hours per month, or 14,604 kilowatt-hours in 2012.

Is net metering right for me?

A customer should ask themselves several questions when considering a net metering project, such as:

- *Will zoning regulations for my area allow for the installation of a generation system, such as a wind turbine or solar panel?* It is fairly common for cities and subdivisions to limit the height of structures and types of structures in their jurisdiction. If zoning laws prohibit wind towers or solar arrays, you may not be a good candidate for a net metering project.
- *What systems will my utility allow and what standards must be met by the system?* Net metering policies will vary by utility. Contact your local utility early in the process of considering a net metering project to obtain copies of their policy.

- *What is my current cost (per kWh) of electricity? What energy price increases can be anticipated?* Net metering projects will have a better financial return in situations with higher per kWh prices or when energy prices are expected to rapidly escalate. In many areas of the United States, current projections assume an annual 3 to 4 percent increase in energy prices in the near term.
- *How much energy per meter do I currently consume?* Net metering establishes an energy offset on a meter-by-meter basis. When calculating energy consumption, customers should only consider the meter they intend to offset with alternative generation. Determining total energy consumption per meter can be accomplished by contacting the utility or reviewing your past statements.
- *What will a net metering system cost?* Before estimating the cost of a renewable energy system use the E³A fact sheets to better understand your specific need. This will help you more accurately estimate the cost your potential project.
- *Do I have an appropriate generation resource?* For example, some locations have better wind and/or solar resources than other locations. The better the resource, the more power the system will generate.

Incentives

Governments, utility companies and nonprofit organizations offer a variety of programs to support alternative energy development. These incentives may include tax credits based on capital costs or electrical production. Other incentives may be in the form of a grant or other direct payment. Free or reduced-cost technical or business planning advice may also be available. The requirements to qualify for these incentives vary depending on the specifics of each program.

Economics

The key economic issues for net metering are:

- The amount of energy being consumed per meter.
- The cost of electricity supplied by the utility and anticipated cost increases.
- The cost of the alternative generation system, less any grant or tax incentives.
- The amount of energy projected to be produced by the alternative generating system.

The revenue (reduced electrical charges) generated by a net metering project is determined by the amount of electricity produced and the rate at which it offsets electricity that otherwise would have been purchased at retail price from the utility company. In Tennessee the statewide average retail price for electricity in 2013 was 9.89 cents per kWh. This was below the national average of 12.52 cents. The financial performance of net metering projects improves as electricity rates increase. Additional revenue may also be available in the form of grants or tax credits. Renewable energy projects may also receive some revenue from the sale of renewable energy or carbon credits.

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