



E³A: Understanding Energy

Understanding Energy

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Net metering electrical energy generators

Nearly all households pay a utility company for electricity on a monthly basis. As discussions of national energy consumption and issues of energy independence become more prevalent, many consumers are considering reducing monthly bills by generating energy themselves. This is typically accomplished by installing a small wind or solar system but can include a host of other technologies as well.

Interconnecting a renewable energy generator while connected to a local electrical utility and receiving incremental credit for energy produced is referred to as net metering. Many states have enacted legislation to encourage this practice, so check local laws and utility programs to understand how net metering is applied in your state.

Net metering involves installing a special meter or reprogramming an existing one so that electrical flow can be measured in terms of electricity production and consumption. Traditional electric meters only measure electricity flowing from the utility company to the customer, which is electrical consumption. Net metering customers produce electricity in addition to consuming it, so the meter must be able to measure the flow of electricity from the consumer and the utility company. Depending on the type of meter currently installed, this may involve the utility company reprogramming an existing meter or installing a new one. Some utilities provide this meter at no cost as part of the interconnection process, but others pass the cost on to the customer. Utilities typically encourage those considering net metering to contact them early in the process to identify meter considerations and to ensure that any wiring is done to their specifications.

A net metering customer's production and use of electricity fluctuates. When their production of electricity is less than their consumption, the utility company supplies additional electricity. Alternatively, when a customer produces more electricity than they use, excess electricity is transferred to the electrical grid to be 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 of electricity consumed. If a customer produced more electricity than they used, the excess amount would be carried over to the next billing period or transferred to the utility company at a price 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 when the difference between production and consumption of electricity is calculated. True-up periods are typically monthly or annual. Arrangements with the utility company also determine the price of any electricity purchased from the utility company and the price at which excess power is purchased by the utility company.

Advantages

Net metering projects can provide a positive financial return. The value over time of lower monthly electric bills is greater than the cost of installing and maintaining the system. Some customers value knowing some of the electricity they use is provided by renewable, local or alternative means. Others value the sense of self-sufficiency.

Concerns

Net metering has 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.

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 changes to energy use that have faster payback.

What's the difference between a kilowatt (kW) and a kilowatt-hour (kWh)?

A watt is a measure of power, and a watt-hour is a measure of energy. Most electrical appliances consume energy in watts, which are a measure of energy conversion. A light bulb with a power rating of 60 watts will use the energy of 60 watt-hours if it is turned on for one hour.

A renewable 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 of a steady power of one kilowatt running for one hour. The electrical meter, which is also called a kilowatt-hour meter, tracks electrical consumption. The utility bills customers each month for the number of kilowatt-hours used during that billing period.

Is net metering right for me?

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

- **Will zoning regulations for my area allow for the installation of a generation system, such as a wind turbine or solar panel?** Cities and subdivisions commonly limit the height and type of structures in their jurisdiction. If zoning laws prohibit wind towers or solar arrays, net metering may not work for you.
- **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 to get 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 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 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. You can

determine total energy consumption per meter by contacting the utility or reviewing past statements.

- **What will a net metering system cost?** Before estimating the cost of a renewable energy system, use the E³A guides to better understand your energy needs and accurately estimate the cost your potential project.
- **Do I have an appropriate generation resource?** Some locations have better wind or solar resources than others, which means more power.

Incentives

Governments, utility companies and nonprofit groups offer programs to support alternative energy development. Incentives can include tax credits based on capital costs or electrical production. Other incentives can take the form of a grant or other direct payments. Reduced-cost technical or business planning advice may also be available. Qualifications for incentives vary depending on each program's specifics.

Economics

Consider these key economic issues for net metering:

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

The revenue 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. 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 can generate some revenue from the sale of renewable energy or carbon credits.

Missouri enacted legislation in June 2007 (S.B. 54) requiring all electric utilities — including investor-owned utilities, municipal utilities and electric cooperatives — to offer net metering to customers with systems capacities up to 100 kW that generate electricity using wind energy, solar-thermal energy, hydroelectric energy, photovoltaics (PV), fuel cells using hydrogen produced by one of the aforementioned resources, or other sources of energy certified as renewable by the Missouri Department of Natural Resources.

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