Fact Sheet on Solar Energy

How can I benefit from solar energy?

Co-op members exploring solar energy have new options. Members can buy or lease solar photovoltaic (PV) panels on their own rooftop or property ("residential solar"). They also have the option of purchasing power from an array developed by their utility or other entity. Members can choose to offset all of their power use with electricity generated with solar energy, or just a portion.

While members with residential solar arrays often benefit from available tax benefits and incentives, they are also responsible for the system and all the up-front costs, which can be significant. With a battery or energy storage system, some residential solar arrays can provide backup power during extended outages.

Community-owned solar is another increasingly popular option. Under this model, members can purchase the output of panels in large solar arrays built and maintained by the co-op, and receive credit for their portion of the electricity produced. This option almost always offers a better value than residential solar, and it's a good choice for members whose property isn't suitable for residential solar.

Can I benefit from solar even if I live in Bismarck, North Dakota?

Many people mistakenly believe solar is only viable in the Southwest, where it's hot and sunny much of the time. In fact, as temperatures rise, solar panels become less efficient. While Bismarck has less sunshine than Florida or Alabama, on those clear cold days solar panels can produce a lot of electricity.

What is the value of electricity generated by solar?

The cost of installing solar arrays has fallen dramatically, and in some regions with high-cost electricity, solar is a cost-competitive option. It all depends on circumstances.

For the developer, the cost of the array is a combination of initial costs and the operating costs over the projected life of the system, divided by the amount of electricity that system will produce. Systems in different regions of the country will produce differing amounts of energy. Even with the declining costs, many solar systems may take ten years or more to return the investment.

Size matters. Utility-scale solar can take advantage of economies of scale, including stream-lined production, installation and materials. *Utility-scale PV systems cost 50 percent less on a dollar-per-kW basis than residential systems.* For this reason, community solar options usually offer a better value to co-op members.

What is an inverter and why do I need one?

An inverter converts electricity generated by solar panels, direct current (DC), into alternating current (AC), electricity that can power your lights and appliances.

How long do PV panels last?

Assuming high quality modules and proper maintenance, the life of a PV system should be 30 years or more. However, the efficiency of the panels will slowly degrade over time. PV modules typically have a warranty for 25 years to 80% of original output. However, they will continue to provide power for many years after that.

Are PV panels safe?

Yes, as long as they are properly installed. There are fire risks associated with all electrical systems, including PV systems. Module defects, improper installation or even general wear and tear (visualize rodents chewing through wiring) can lead to fires. But these risks have been addressed in changes to local building and electrical codes. Many co-ops now offer education and training for fire departments.

Are all PV panels created equal?

While the efficiency of PV technologies is improving, because PV cells cannot respond to the entire spectrum of sunlight; up to 55% of the sun's energy is wasted. The amount of energy produced by any given PV panel depends on four factors: the PV cell efficiency, the temperature response of the cells, the module layout and the anti-reflective coating. Residential solar arrays should use high efficiency modules, which allow more power to be installed in a smaller area.

Are PV panels environmentally friendly?

Yes, if the producer follows industry best practices.

Can PV panels be recycled?

Yes, but it's not as easy as recycling newspapers. Some companies include recycling as part of their initial system price. End-of-life disposal of solar products in the US is governed by the Federal Resource Conservation and Recovery Act (RCRA) and state policies. Check with state or local agencies on recycling requirements.

Can too much solar be a bad thing for the power grid?

For decades electricity has, essentially, traveled a one-way street from the power plant to the end-user. That is changing as technological advances enable end-users to send power from solar arrays, bio-digesters, small wind turbines back onto the grid. Energy storage and micro-grids are also changing how the grid operates. These changes are driving efforts nationwide to modernize the grid and create a system that is more dynamic and resilient.

Feeding the grid large amounts of electricity generated from sun and wind poses some challenges. Experience shows that increases in solar and other intermittent generation affect power plants that may have to slow or shut down in response to the drop in demand. This rapid cycling stresses the power plant. In one study a 30 % increase in wind energy increased maintenance costs of a 400 MW coal-fired power plant by $2 million a year.

Can solar energy be stored?

There are many different technologies for storing energy, including new residential battery options for adventurous consumers. Not only are the technology and applications for energy storage evolving rapidly, the costs are also coming down. But overall this industry is still in the early stages. One thing we know for sure: the energy storage marketplace will look vastly different in a few short years.

And what about solar water heating?

Members can also take advantage of solar energy by using the sun to heat their water. Solar water heating (SWH), a technique that runs water through a tube covered in a heat absorbing material located in a sunny place, is not tied to the electrical system and does not generate electricity. SWH and PV panels are not mutually exclusive and can be used together.