Renewable Energy

In the United States, just over 11 percent of energy consumed is produced by renewable sources. The overwhelming majority of our energy still comes from fossil fuels.

Solar Power

The sun is constantly producing staggering amounts of energy and making it possible for Earth to be warm enough for life. The solar energy that reaches Earth's surface can be harnessed as a power source using active solar energy collection. The most common form of active solar collection is through the use of solar panels.

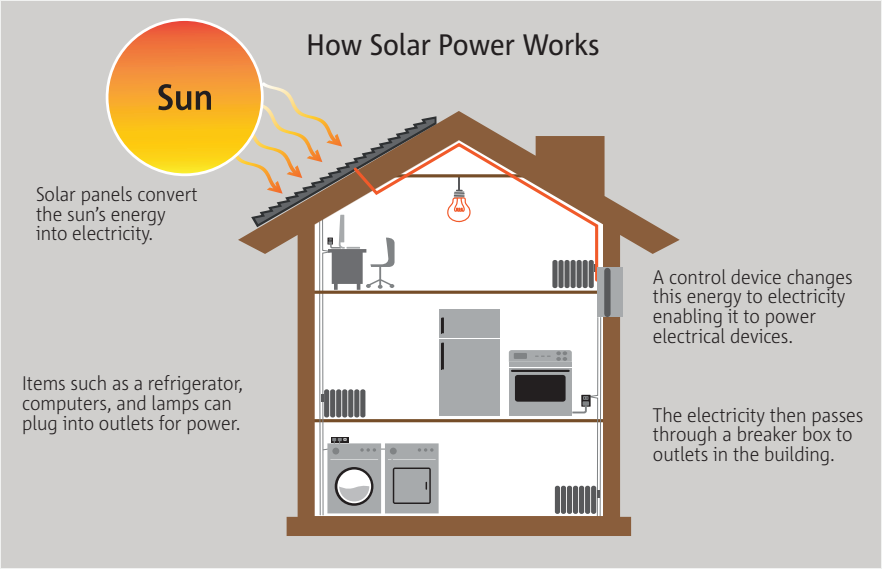
Despite being one of the most reliable sources of energy, solar energy accounts for only about 2 percent of energy production in the United States. Costs and lack of subsidies are two major barriers preventing large-scale construction of solar farms. According to a 2018 study, the US could meet all of its electricity demand from solar panels that cover just 0.6 percent of its land area.

Wind Power

Wind turbines are mechanical devices that convert the kinetic energy of the wind into electrical energy. Modern turbines are modeled after old-fashioned wooden windmills popular in Europe for grinding grain and pumping water. Like solar panels, wind turbines produce zero emissions once in place. In addition, turbines produce about 20 times more energy than they consume, making them an efficient option.

Consider the advantages and disadvantages of solar power and complete the table below.

Advantages of Solar Power	Disadvantages of Solar Power

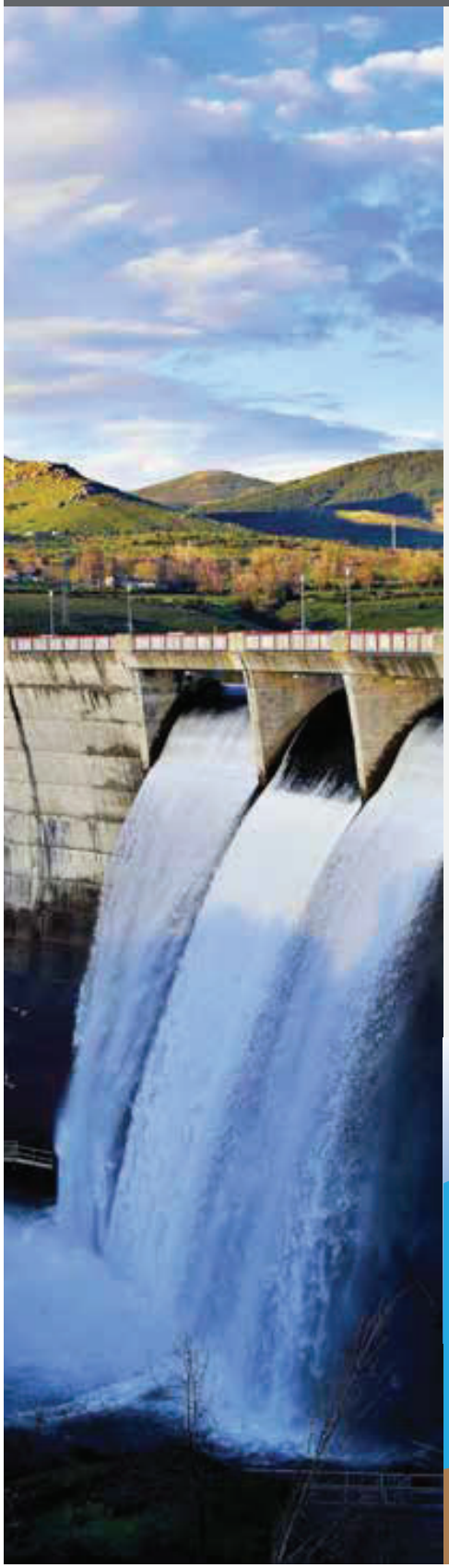


Why do you think that wind power surpasses solar power generation?

What are the pros and cons of offshore wind farms?

What reasons might a landowner have for not wanting a wind farm on their property?

Floating solar farms have some unique advantages. Find out why!



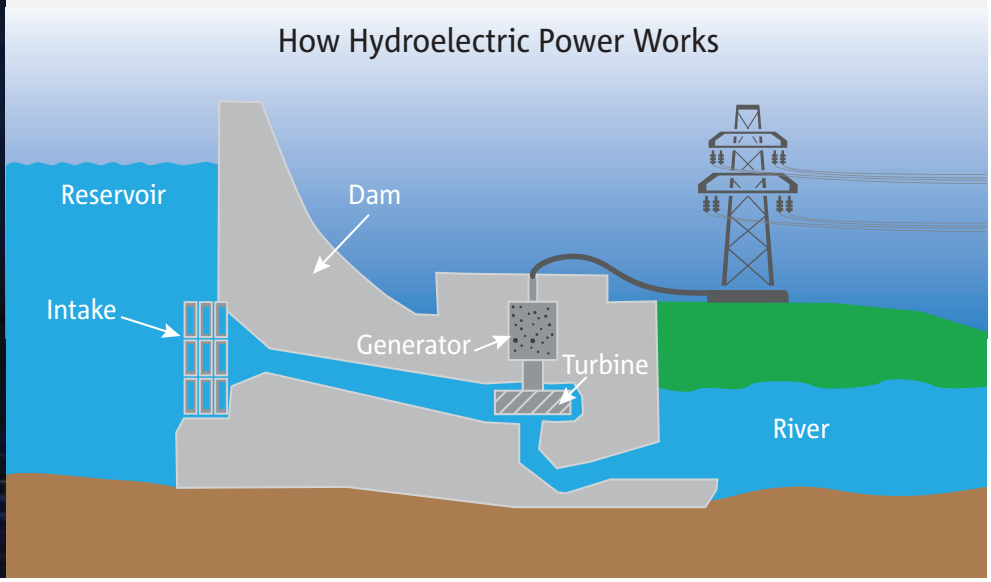
Renewable Energy *continued*

Hydro Power

Hydro power refers to any technology that uses the kinetic energy produced from the motion of water to generate electrical energy. Hydro is a Greek root meaning "water." Large-scale hydro power exists in the form of dams across rivers. The water held in the reservoir created by the dam is allowed to flow through, and in the process it turns turbines that generate power.

Critics of dams claim that they are a source of methane released into the atmosphere. Where does that methane come from?

How might climate change affect the output of dams in the future?

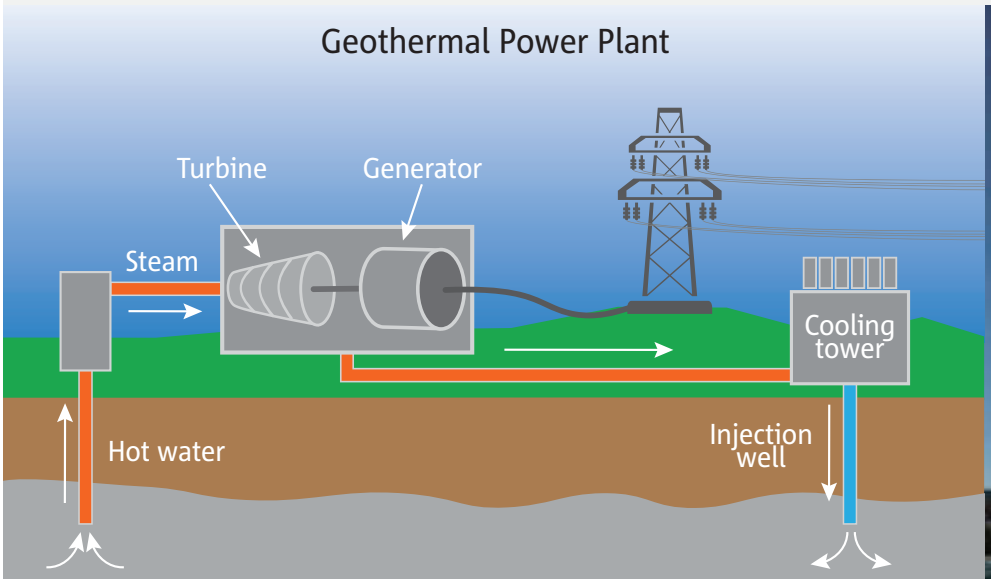


Geothermal Power

Geothermal energy takes advantage of the heat that is stored within Earth's core. Generally, Earth's warmth heats groundwater, which can be pumped into buildings to provide heat. This is only economically feasible where natural hot spots exist and the heated water does not have to be transported far. Geothermal power plants work like fossil fuel plants, but the steam that turns the turbines is natural and doesn't require an input of energy to start the process.

What are some reasons that geothermal energy might not be considered renewable?

What are some reasons that investment in a geothermal power plant might not be economically viable in the long term?



Renewable Energy *continued*

Biomass and Biofuels

Biomass consists of plant materials and agricultural waste that can be directly burned or converted into fuel. In less industrialized countries burning wood and wood byproducts accounts for the majority of heating and cooking.

Biofuels, such as ethanol and biodiesel, can be used as substitutes for gasoline and diesel, respectively. Ethanol is primarily produced using corn and corn byproducts. Plant starches and sugars are converted into alcohol and carbon dioxide. Biodiesel is made by extracting and altering the oil from plants.

What are some reasons that biomass might not be considered renewable?

How does biomass energy from burning wood potentially accelerate global warming?

In what ways do corn farmers benefit from increased reliance on ethanol?

What might an opponent to ethanol-based fuels say about the corn industry?