Renewable Energy

Opposing Viewpoints Online Collection, 2015
From Opposing Viewpoints in Context

The massive amounts of energy that industrialized nations, including the United States, require for their factories, automobiles, electrical appliances, and other features of modern life come from a variety of sources. These sources fall within one of two categories: fossil fuels and renewable energy sources. Fossil fuels such as petroleum, natural gas, and coal are nonrenewable resources. Once they are taken out of the ground and burned, they are gone. Renewable energy sources, by contrast, can be utilized without being "used up." Examples include solar energy, wind, hydropower, and biomass.

As of late 2009, renewable energy accounted for only 10.5 percent of all the energy produced in the United States. Fossil fuels are well-established and can provide energy at lower costs than renewable sources. But they are being consumed 100,000 times faster than they are being formed, and many people are concerned that they will run out in the not-too-distant future. Environmentalists and others argue that the United States and other nations should meet more of their energy demand from renewable sources. Solar and other renewable energy sources, they contend, will not only help create a more stable energy supply that will never run out, but can also reduce pollution and environmental degradation, reduce the need to import oil and other fossil fuels from foreign countries, and possibly prevent global warming by stopping the release of greenhouse gasses that are a byproduct of burning fossil fuels.

Solar Energy

Solar energy is the energy that comes directly to the Earth from the sun. This energy arrives in the form of solar radiation, and must be converted directly or indirectly into electricity or other usable forms of energy.

One method of solar-electricity generation is solar thermal plants. Solar thermal plants use the sun's rays to heat liquid into steam. The steam drives turbines and generates electricity. Another solar energy technology is the photovoltaic cell. These are also called solar cells or PVs, and convert the sun's light (photons) directly into electricity (voltage). First developed in the 1950s, solar cells are made of silicon or other semiconducting materials. They are used in space satellites, on watches and calculators, and on homes, where they can be placed on the roof.

Environmentalists and other solar energy enthusiasts have long advocated solar energy as a clean and inexhaustible resource. However, solar energy has two main drawbacks. First, it is unpredictable; a solar energy generator will not work on cloudy days. Second, solar energy plants often require large amounts of land to work efficiently. Large solar plants may harm desert ecosystems. Decades of research have raised the efficiency of solar cells from four percent to fifteen percent—meaning that cells can only convert a fraction of solar energy into usable electricity. These factors, combined with the initial high costs of establishing solar energy plants and household solar panels, have discouraged

the wider use of solar power.

Geothermal Energy

The term “geothermal” comes from the Greek words for earth (geo) and heat (therme) and refers to the energy that is produced from deep within the Earth’s crust. It comes in the form of hot water and steam that is created when water seeping underground comes in contact with hot rocks below the Earth’s surface. Geothermal energy is renewable because Earth is producing heat, and water is constantly replenished by rainfall.

The hot water and steam produced by geothermal energy can be used directly or harnessed to produce electricity. However, geothermal energy is only feasible in parts of the world where hot rocks lie near the planet’s surface. Geothermal plants are a main source of power for the country of Iceland; they have also been made in Greece, Japan, Mexico, the United States, and a few other countries.

Hydropower

Hydropower is the most used renewable energy source used in the United States. It accounted for almost 80 percent of the renewable energy and 9 percent of the total electricity generated in the United States in 2008. It works by harnessing the significant mechanical energy produced by the flowing water found in large rivers. In a typical hydropower plant, water is channeled through pipes called penstocks and turn turbines which in turn generate electricity. Examples of significant hydropower stations include Hoover Dam in Nevada and the Grand Coulee Dam in Washington.

Like other renewable energy sources such as solar and wind power, hydropower does not produce air or water pollution, and the source of energy (flowing water) is almost free. However, environmentalists have criticized hydropower for its effects on the surrounding natural environment. Building hydropower dams can cause significant dislocation in local ecosystems, as rivers are changed into lakes. One noted example of this is the problem of threatened salmon populations. Hydroelectric dams can thwart salmon that are attempting to swim upstream to reach their spawning grounds to reproduce.

Wind Power

Wind is a byproduct of solar energy; the uneven heating of the air over land and water creates wind as warm air rises and cool air rushes in to take its place. It has been harnessed as energy for thousands of years in the form of windmills, but more recently has been viewed as a possible renewable source of electricity. In recent years modern “wind farms” have been constructed with large numbers of turbines that generate electricity when rotated by the wind. As of 2009, wind power usage was growing in the United States at the rate of 30 percent per year. However, some people oppose the construction of large wind farms because they believe such farms are dangerous to flying birds and mar scenic views. A proposed offshore wind farm off of Cape Cod, Massachusetts, has run into opposition for these reasons. As of 2009, the United States led the world in wind power, in terms of megawatts of power produced. Within the United States, Texas is by far the largest producer of wind energy, with

9,410 megawatts of capacity as of 2009.

Hydrogen

Hydrogen has been touted as having the potential to replace gas and oil as fuel for cars. It is the most plentiful element in the universe, burns easily, and the one "pollutant" it gives off when used is water vapor. Vehicles that run on hydrogen are still in the development stage. Hydrogen is produced by running electricity through water to separate it into hydrogen and oxygen—a process that takes enormous amounts of energy, causing some people to question its ultimate feasibility.

Biomass

Biomass energy is energy derived from plants and trees, which store energy from the sun in the form of chemical energy that can be released when burned. Biomass can be burned for energy, or it can be converted into a liquid or gas fuel. Ethanol is one of the most commonly produced biofuels. It is an alcohol fuel that is made from sugars found in sugar cane, potato skins, wheat, and rice. In the United States, corn is the leading source of ethanol. Ethanol is more expensive to produce than petroleum-based gasoline, but is renewable and produces fewer pollutants. However, some people have questioned whether the U.S. government should heavily subsidize the production of corn and ethanol. They note that the diversion of corn into ethanol production has caused corn prices to rise and has led to food shortages in some parts of the world. In addition, clearing forests to increase corn production may worsen the problem of global warming. Burning ethanol also releases greenhouse gases.

U.S. Energy Policy and Renewable Sources

Energy policy in the United States is made by federal and state laws and programs that mandate or guide energy production and use. Whether the federal or state governments should subsidize or otherwise encourage renewable energy sources—and discourage fossil fuel use—is a matter of ongoing debate. Most states have passed laws that include incentives for individuals or businesses to use some sort of renewable energy source such as solar energy. The Energy Policy Act of 2005, a federal law, provided some subsidies and federal funding for wind, solar, and other renewable energies, and called for 7.5 billion gallons of biofuels such as ethanol to be used by 2012—but also contained significant subsidies for fossil fuels. Some believe that the federal government could do more to promote renewable energy. "At one time the United States was the world leader in renewable-energy production and technology," writes science reporter Stephen Leahy, "but it has fallen behind countries like Germany, Norway, Spain and Britain." In 2009, President Obama's Recovery Act allocated approximately $3.5 billion to the Department of Energy's program for research and development in renewable energy and energy conservation.

Renewable energy activists have made proposals in addition to more research funding. One is for the federal government to set targets mandating that a certain amount or percentage of America's energy production is to come from renewable sources. As of early 2010, 34 states as well as the District of Columbia have passed laws setting dates by which a certain percentage of energy produced within the

state is required to be generated by solar, wind, or other renewable sources. But attorney and environmental activist Stephen Filler argues that “a national standard is needed to harness the price stability, energy security, economic development, and environmental benefits of renewable energy for the entire country.” Another proposal is to enact taxes on the release of carbon, which would encourage renewable energy and discourage fossil fuel use. But critics of government involvement in the economy, like Robert L. Bradley of the National Center for Policy Analysis, question whether the federal government should be in the business of “picking and choosing” which energy sources to promote instead of letting the free market decide. “The economic and environmental shortcomings of renewable energies point to a stark historical fact: a multibillion dollar public-sector malinvestment has taken place,” he writes, concluding that the United States should “stop throwing good money after bad.”

Source Citation

"Renewable Energy." *Opposing Viewpoints Online Collection*, Gale, 2015. *Opposing Viewpoints in Context*, http://link.galegroup.com/apps/doc/PC3010999388/OVIC?u=cuny_centraloff&xid=e5da7750. Accessed 28 Feb. 2018.

Gale Document Number: GALEIPC3010999388