Alternative Energy Sources

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Energy costs are increasing as we use up our natural resources. The cost of importing additional resource significantly increases total costs. There have been several developments in alternatives energy sources that have the possibility to replace fossil fuels. Each alternative has its pros and cons, and none of these have proven effective enough at this time to completely replace fossil fuels. Two of the most popular alternatives are nuclear energy and wind energy.

Nuclear energy is generated similar to a power plant in that it produces heat. When the heat hits the water it turns into steam which caused pressure turning the generators and producing energy. The different is how it produces heat. While a power plant requires the burning of coal, oil or natural gas to generate heat, a nuclear power plant uses Uranium as a nuclear reactor to generate heat by creating nuclear fission.

This is done by machine pressing Uranium oxide into cylinders called fuel pellets. These fuel pellets are then loaded into fuel rods. Each uranium fuel pellet contains millions of uranium nuclei which release a huge amount of kinetic energy, and some radioactive energy then split. This kinetic energy then produces heat.

There are several advantages to nuclear power including the abundant amount of Uranium, a naturally radioactive element found in most rocks. Nuclear power is very inexpensive compared to other energy sources. When calculating the cost of nuclear power the following factors are considered; cost of purchasing the uranium, converting, enriching, and fabricating services along with storage and shipment costs. Other expenses include operation and maintenance cost, production cost, and waste management cost. From 1995 to 2011 the average total cost of nuclear power production per kilowatt-hour was 2.22 cents. Nuclear power plants produce a lot of energy from a small amount of fuel, and are very reliable power source.
“Nuclear energy is the only electricity source that can generate electricity 24/7 reliably, efficiently and with no greenhouse-gas emissions.” (Nuclear Energy Institute, 2013) Unlike fossil fuel energy, nuclear energy is much cleaner. It does not produce carbon dioxide or smoke, but instead only small amounts of waste. “Nuclear generated electricity avoided 613 million metric tons of carbon dioxide in 2011 in the U.S. “(Nuclear Energy Institution, 2013)

There are also disadvantages to nuclear power. It can be very dangerous. Malfunctions in nuclear power plants can devastate a large area. The small amount of waste produced from producing nuclear energy is extremely dangerous. It must be sealed and buried for thousands of years. In burying it there is a risk of it being impacted by earthquakes or floods. There is also a chance that terrorist may gain access to it. Nuclear weapons are also a concern. Nuclear energy from Uranium is not renewable.

Wind energy is produced by wind turbines. A wind turbine consists of three large, propeller-like blades mounted to the top of a tall pole. As the wind blows it turns the blades producing power to the generator which produces electricity.

There are several advantages to wind energy. It is clean and does not pollute the air. “Yearly emissions eliminated by generating energy from a 1 MW wind turbine instead of 1 MW of conventional sources: over 1,500 tons of carbon dioxide, 6.5 tons of sulfur dioxide, 3.2 tons of nitrogen oxides, and 60 pounds of mercury in one year.” (Reeves, 2003) Wind energy is a renewable source and has the potential to produce an abundance of energy. According to The National Wind Coordinating Committee, the typical leveled cost of energy per kilowatt–hour is 4.37 cents. (Reeves, 2003)

There are also disadvantages of wind energy. Without a form of storage, wind energy cannot be used as a reliable source of energy due to the fluctuation of wind. The initial cost of
installing wind turbines can be very expensive, and if damaged can be costly. Wind turbines have also been known to kill wildlife such as birds. And can be very noisy.

As you can see there are advantages and disadvantages to both alternate energy sources, and whether or not they are the right decision may depend on various circumstances. One thing is for sure something some be done to replace our current energy source before it is gone.
References


