

Renewable energy, is energy which is generated, from natural sources, such as the sun, wind, tides and can be generated again and again forever, as needed. They are plentiful and by far the cleanest sources of energy available on this planet. Energy that we receive from the sun, can be used to generate electricity. Similarly, energy from wind, geothermal and falling water can also be used to create electricity, which we can use in our homes for heating, lighting, or TV.

- 1) **Hydroelectric Power** is the largest source of renewable energy. This renewable source of



energy provides 10% of the nation's electricity. As of now, there are 77,000 megawatts of hydro-electrical power, enough to provide 35 million homes with energy. Converting flowing water into usable energy produces hydro-electrical power. Most of this water comes from rivers and is released through turbines to harness the gravitation energy from the flowing water.

### Pros – Renewable

- The sun, wind, geothermal and ocean energy are available in abundant quantity virtually everywhere on earth.
- The non-renewable sources of energy that we are using are limited and are bound to expire one day, likely within next few generations.
- Renewable sources of energy have *low carbon emissions*, therefore they are considered “green” and more environmentally friendly.
- Renewable energy can help in stimulating new sections of the economy, by creating new job opportunities.
- You don't have to rely on other countries for the supply of renewable sources, which is the case with non-renewables much of the time, with a country of our size.
- Renewable sources can cost less than consuming the local electrical supply. In the long run, the prices of electricity are expected to soar since they are based on the prices of crude oil, which is limited. Renewables can cut cost the of a home's electricity bill.
- Various tax incentives from our government come in the form of tax waivers or credit deductions and are available for individuals and businesses who want to go *green*.
- A positive fact is that geothermal energy is very cost effective and reliable.
- Solar cells are great, because they don't require high maintenance, are very reliable and don't produce pollutants.

### Cons-Renewable

- It is not easy to set up many types of *renewable resource power plants*, as the initial costs are often quite steep.
- The downside to solar cells is, that it costs more than other energy sources right now and tends to work effectively only when the sun is shining.
- Solar energy can be used during the day time and not during night or rainy season.

**Megawatts** are used to measure the output of a power plant or the amount of electricity required by an entire city. One **megawatt** (MW) = 1,000 kilowatts = 1,000,000 watts.

**Force x distance = work (energy)    Work (energy) / time = watts (electricity)**

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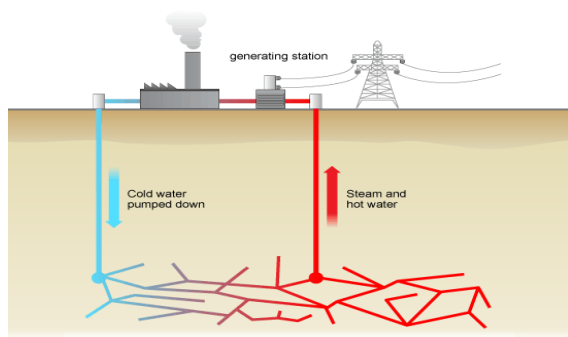
- Geothermal energy, which can be used to generate electricity has side effects too. It can bring toxic chemicals beneath the earth surface onto the top and create serious environmental and hazards for humans.
- Another downside to geothermal energy is that locations can be hard to find, which are suitable for tapping into this resource deep below the ground.
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- 2) Geothermal energy is capable of producing about 2,800 megawatts of energy per year, or roughly 0.2% of the energy in the United States.



Geothermal energy is produced from naturally occurring steam and hot water from under the Earth's surface. The steam rotates a turbine, which in turn powers an electric generator. Also, hot water can be used to directly heat buildings. The State of NY Department of Environmental Conservation has recently installed, an expensive large scale geothermal plant under ground for its facility right here in New

Paltz, which does just that, heating the building without the need for a furnace.

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- 3) Wind energy produces about 2,500 megawatts of energy and generates a mere 0.1% of our



electricity. The wind rotates blades around a hub, which is connected to the main shaft. The main shaft spins a generator. The size of turbines is determined by how much energy is needed. Small wind turbines are usually used for homes, farms and ranches. Other ways to use wind energy include grinding grain and pumping water. Wind is classed in categories of 1 through 7, with 7 being the highest and 1 being the lowest. A good wind source that has a class of 3 or higher is the east coast and along the Appalachian Mountains. North Dakota is an excellent wind source, with typical winds higher than 5 making it idea for wind farms.

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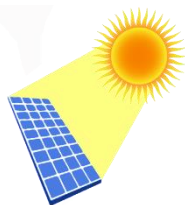
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- 4) Solar cells produce electricity from the sunlight. Materials used in computer chips are similar to materials used in solar cells. These materials absorb sunlight, which frees the electrons from their atoms and allows them to generate electricity. Even in the northeastern United States, where sunlight is variable, solar energy helps to warm and light many buildings and can make a significant contribution to meeting demand for electricity and hot water. The solar cell industry is perhaps the most in demand and highest rising alternative energy sector going right now. It is creating jobs and fueling the economy.



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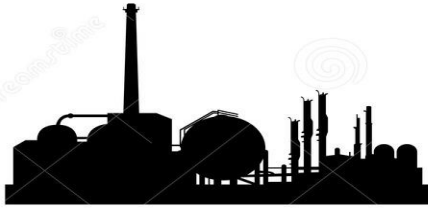
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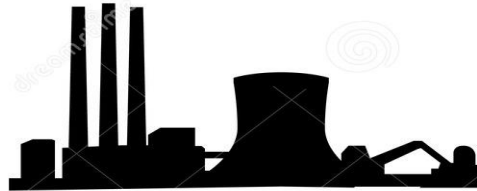
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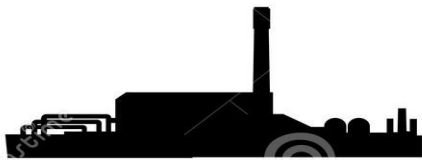




OIL POWER PLANT



FOSSIL AND GAS POWER PLANT



GEO THERMAL POWER PLANT



WIND POWER PLANT



SOLAR CELLS POWER PLANT



NUCLEAR POWER PLANT



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