

Nonrenewable energy is energy which is taken from the sources that are available on the earth in limited quantity and some types may very well run out in the next fifty to sixty years. Nonrenewable sources are not necessarily always environmentally friendly and have negative effects on human health. They are called nonrenewable because they cannot be regenerated within a short span of time relative to human life times. Nonrenewable sources exist in the form of fossil fuels, natural gas, oil and coal.



1) **Oil (Petroleum)** or *Petrol* for short.

Oil was formed from the remains of animals and plants that lived millions of years ago in marine (ocean water) environments before and during the dinosaurs. Over the years, the remains were covered by layers of mud. Heat and pressure from these layers helped the remains turn into what we today call crude oil. The word “petroleum” means “rock oil” or “oil from the earth.”

Where does Oil come from?

Crude oil is a smelly, yellow-to-black liquid, and rich in energy and is usually found in deep underground areas called reservoirs. Scientist and engineers explore a chosen area by studying rock samples from the earth to determine if oil might be found below. Measurements are taken and if the site seems promising, drilling begins. Above the hole, a structure called a ‘derrick’ is built to house the tools and pipes going into the well. When finished, the drill well, will bring a steady flow of oil to the surface.

Pros of Non-renewable

- Nonrenewable sources are cheap and easy to use. You can easily fill up your car, power your motor vehicle and drive anywhere.
- You can use a small amount of nuclear energy to produce large amounts of power.
- Nonrenewable energy has little or no competition at all. For example: if you are driving an electric car and your battery goes dead, where do you plug it in again?
- Nonrenewable energy is considered less expensive, by some, when compared to the cost of converting our nation’s industries and economy into one based solely on renewable energy.

Cons of Non-renewable

- Nonrenewable sources of energy will expire someday soon. If we as Americans want to maintain our current standard of living today, Americans of tomorrow (the next generation) will have to suffer some day down the line.
- The speed at which these resources are being consumed is going to increase as the world population grows. This can have serious environmental changes and in turn environmental consequences.
- Nonrenewable sources release toxic gases into the air when burnt, which are the cause of acid rain and the major cause for global warming today.
- Since these sources are going to expire soon, prices of these sources are soaring day by day.

Megawatts are used to measure the output of a power plant or the amount of electricity required by an entire city.

1 megawatt (MW) = 1,000 kilowatts = 1,000,000 watts.

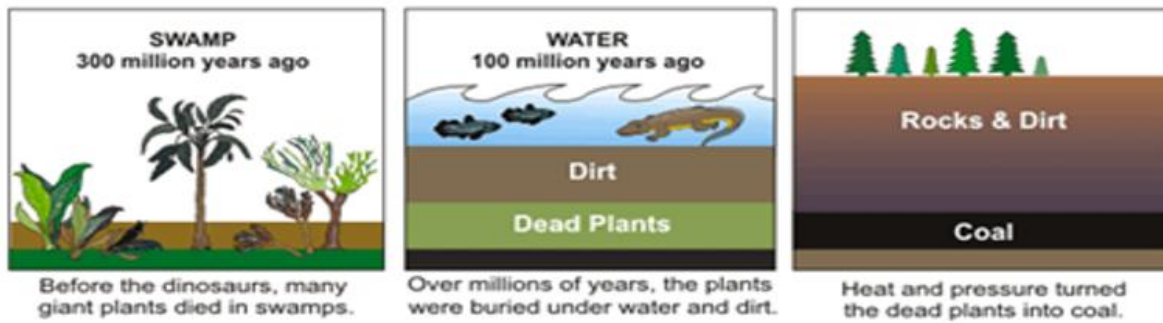
Force x distance = work (energy) Work (energy) / time = watts (electricity)

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2) **Coal**

How was coal formed?

Coal is a combustible black to brownish-black rock composed mostly of carbon and hydrocarbons. It is the most abundant fossil fuel produced and found in the United States. There are vast coal reserves in places like Pennsylvania. Coal is a nonrenewable energy source, because it takes millions of years to create. The energy in coal comes from the energy stored by plants that lived hundreds of millions of years ago, when the earth was partly covered by vast swampy forests. For millions of years, layer upon layer of dead and decaying plants piled up and were covered over by dirt, trapping the energy of the once living plants below ground. The heat and pressure from above eventually turned this plant matter into what we today call coal.



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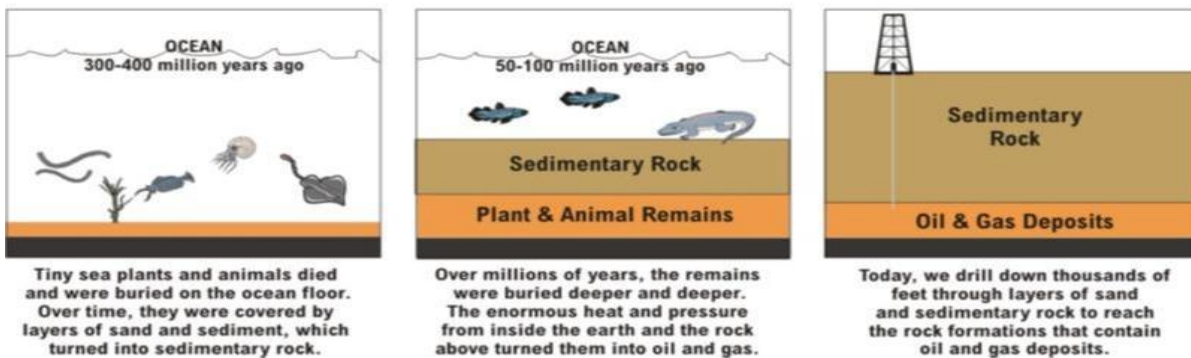
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3) **Natural Gas** – is a *gas* not *liquid*, like gasoline from the pump.

Where does natural gas come from?

Millions of years ago, the remains of plants and animals built up in thick layers. This matter then decayed and is called *organic*, because it was once alive. Over time, mud and soil covered over this organic layer. The mud and soil above turned into rock and then trapped the organic matter below. This layer of plants and animals was then exposed to intense heat and pressure over thousands of years. Some of the organic matter becomes oil, some coal and some natural gas – tiny bubbles of odorless gas that accumulate. The main ingredient in natural gas is methane, a gas composed of one carbon atom and four hydrogen atoms.



In some places, gas escapes from small gaps in the rock into the air; then, if there is enough activation energy from lightning or a fire, it burns. When people first saw the flames, they experimented with them and learned they could use them for heat and light.

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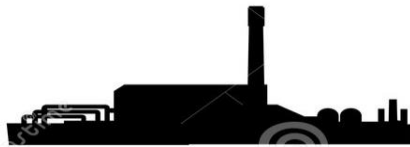
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OIL POWER PLANT



FOSSIL AND GAS POWER PLANT



GEOTHERMAL POWER PLANT



WIND POWER PLANT



SOLAR CELLS POWER PLANT



NUCLEAR POWER PLANT



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4) Nuclear Energy



Nuclear energy is energy in the nucleus (center or core) of an atom. Atoms are tiny particles that make up every object in the universe. There is enormous energy in the bonds that hold atoms together. Nuclear energy can be used to make electricity. But first, the energy must be released. It can be released in one of two ways: in the form of nuclear fusion or nuclear fission.

In nuclear fusion, energy is released when atoms are combined or fused together to form a larger atom. This is how the sun produces energy. In nuclear fission, atoms are split apart to form smaller atoms, releasing energy. Nuclear power plants use nuclear fission to produce electricity.

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