Nuclear Energy

Nuclear energy is the energy inside an atom. This energy comes from the forces that hold the nucleus of the atom together. Today, we understand how to capture this extremely potent energy and use it to generate electricity. The ability to generate large amounts of energy from very small amounts of matter was first proposed by Albert Einstein.

Nuclear energy is created using a process called nuclear fission, in which a large atom is split into smaller atoms. Splitting an atom releases an enormous amount of energy which, when released in a slow and controlled matter, can be used to generate electricity. Releasing the energy all at once, on the other hand, is extremely destructive, and is the technology behind the nuclear bomb.

Nuclear Power Plants use controlled nuclear fission of uranium atoms to create heat. This heat is then used to turn water into steam, which in turn powers electrical generators. There are over 100 nuclear power plants in the United States generating about 20% of the electricity used here. Nuclear power is also used to create propulsion in ships and submarines. It is extremely efficient, and allows submarines to travel at high speeds and remain underwater for long periods of time. Nuclear fission also powers naval ships, ships used to break up ice, and space ships. Nuclear fission produces dangerous waste products that must be dealt with. Every nuclear power plant includes waste processing facilities, and treatment must comply with national safety regulations.

Nuclear energy can also be created through a process called fusion. Fusion is the opposite of fission; rather than splitting an atom apart, fusion joins atoms together. Stars get their energy from nuclear fusion, where hydrogen atoms are constantly being converted into helium atoms. So far, scientists have not been able to determine how to create usable energy by fusion. They remain hopeful, however, as fusion produces less radioactivity and could produce an unlimited supply of energy.