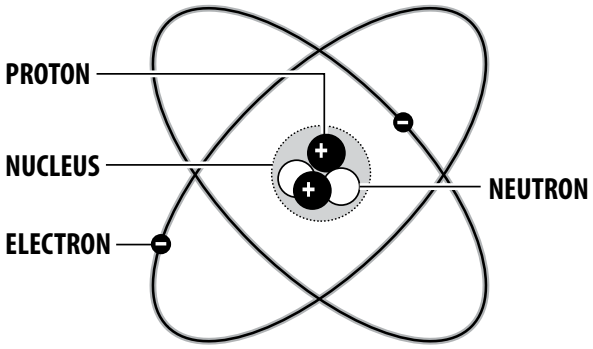
Uranium (Nuclear)

Uranium is a mineral found in rocks in the ground. Uranium is nonrenewable. We can't make more. There is plenty of uranium in many parts of the world. We split uranium atoms to release energy.

Atoms

Everything is made of **atoms**. Stars, trees, horses, air—all are made of atoms. Atoms are tiny, tiny particles.



Every atom is made of even smaller particles. In the center of an atom is the **nucleus**. It has **protons** and **neutrons** in it. Moving around the nucleus are **electrons**.

The number of protons tells us what kind of atom it is. So far, more than 100 different types of atoms have been found. You haven't heard of some of them. There are some you do know. Hydrogen is a gas—every atom of hydrogen has one proton. Oxygen has eight, tin has 50, and uranium has 92.

Nuclear Energy

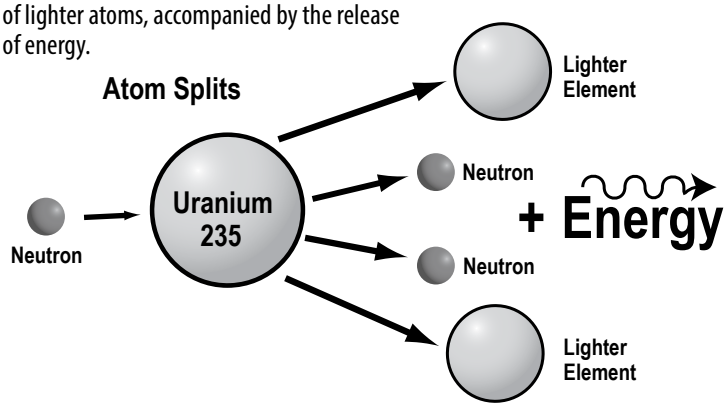
There is energy stored in the nucleus of an atom. It is called **nuclear energy**. It holds the atom together. To use this energy, we have to set it free. There are two ways to free the energy in atoms.

The first way is to combine atoms to make a new atom. This is called **fusion**. The energy from the sun comes from fusion. Inside the sun, small hydrogen atoms combine to make larger helium atoms. Helium atoms don't need as much energy to hold them together. The extra energy is released as solar energy.

Another way to free the energy in atoms is to split them apart. We can split one atom into two smaller atoms. This is called **fission**. The two smaller atoms don't need all the energy that held the larger atom together. The extra energy is released as heat and **radiation**.

Fission

The splitting of the nucleus of an atom into nuclei of lighter atoms, accompanied by the release of energy.



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We Use Nuclear Energy Every Day

Nuclear **power plants** use fission to make electricity. Atoms of uranium are split into two smaller atoms. The extra energy is released as heat, which is used to make electricity.

Nuclear power is clean since no fuel is burned to pollute the air. And uranium is a cheap fuel. Right now, about 18 percent of our electricity comes from splitting atoms of uranium in nuclear power plants.

Radiation Can Be Dangerous

During fission, heat isn't the only energy that is released. Rays of energy, like x-rays, are also given off. These rays of energy, called gamma radiation, can be dangerous in large amounts. Radiation is everywhere. It comes from the sun, outer space, and even some rocks. Doctors use radiation to see broken bones or treat cancer. Small amounts of radiation are not dangerous.

Large amounts of radiation can kill our cells and poison our food and water. Power plants are very careful to keep radiation from escaping. The power plants in the United States are required to follow rules to keep their employees and communities safe.

Used Nuclear Fuel Is a Challenge

The fuel from nuclear power plants produces radiation for a long time. After the fuel is used, it still is **radioactive**—it gives off radiation. It can't be put into a landfill. It must be carefully stored.

Radiation from nuclear power plants is dangerous if it is not controlled. However, nuclear energy makes electricity without air pollution. Some people think nuclear energy is a good idea because it is clean and safe. Other people think the threat from radiation makes nuclear energy too dangerous.

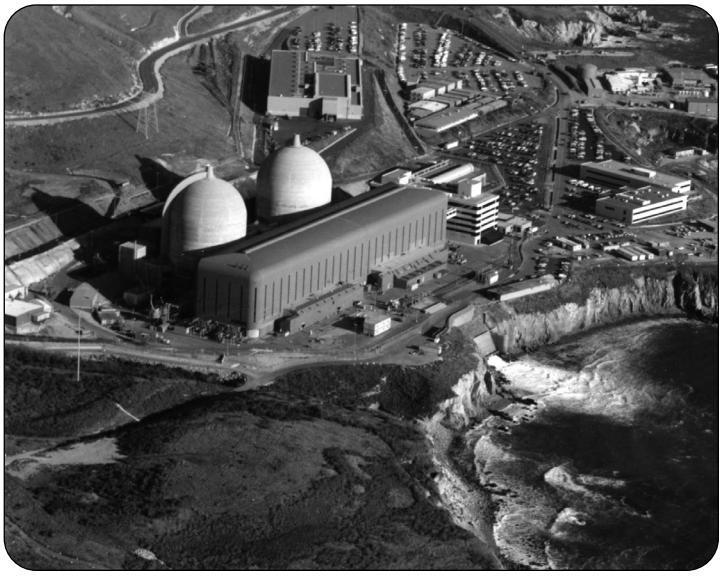


Image courtesy of U.S. Nuclear Regulatory Commission

Pacific Gas and Electric's Diablo Canyon Nuclear Power Plant in California.