## **ENGERY CARD:**

## Nuclear Power Nuclear Fission Radio-Active Waste

The United States is the world's largest supplier of nuclear power. Between 1974 and 1977 over 100 nuclear reactors were built in the United States. No new reactors have been built since then. In fact, four nuclear reactors, including two in San Onofre, California, were permanently closed in 2013 because of maintenance and repair costs. Still, the existing reactors produce about 19% of the electrical energy used in this country.

Nuclear power is produced in a large reactor when enriched uranium atoms are split. Uranium is a mineral mined from the ground. It is formed into pellets that are put in tubes inside of nuclear reactors. The pellets are blasted with neutrons in these tubes, causing the uranium atoms to split apart. This process is called nuclear fission. The nuclear fission process creates huge amounts of heat, which is used to turn liquid water into steam. The steam is used to turn turbine blades that power a generator. The generator produces electricity.

Unfortunately, nuclear fission also creates nuclear waste that gives off radiation. Radiation occurs naturally in soil, water, rocks, building materials, and even food. In small amounts, radiation is not harmful to humans. In large amounts, radiation causes illness and death. Nuclear waste continues to give off radiation for hundreds of years after it is created. The United States alone creates over 12,000 tons of radioactive nuclear waste every year. This nuclear waste contains a lot of radiation and can be harmful to humans if it is not stored properly.

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Nuclear waste is usually stored in large containers that look like barrels. These barrels are made of materials that help contain the radiation, but so far no country has been able to create a container that holds in all the radiation. This creates a problem: where do we store all of the nuclear waste we produce? Currently, the nuclear waste is stored in repositories near the nuclear reactors in which it is produced. This means that the waste is often stored fairly close to large populations of Americans. Since the 1980s, the United States government has been trying to build a storage facility under the Yucca Mountains in the state of Nevada. The people who live near these mountains do not want the nuclear waste stored there because it is dangerous to humans. Environmentalists are concerned that nuclear storage sites will harm all the plants and animals that live in the area.

Nuclear waste storage continues to be a problem and prevents the United States from building more nuclear reactors to create energy. Some scientists suggest that building a nuclear waste storage site on the Moon would solve the problem of where to store the radioactive waste. They argue it would be fairly inexpensive to build a site on, or below, the surface of the moon that would be large enough to store all the nuclear waste the United States produces. This would allow us to expand our use of the nuclear fission process to produce low cost electrical energy here on earth. If the United States were to choose this option to solve our energy problems, a colony would have to be built on the Moon for the workers who would run the nuclear waste storage site.