

NUCLEAR ENERGY: ADVANTAGES OF NUCLEAR ENERGY

What is nuclear energy?

Nuclear energy is a powerful source of energy, generated during a nuclear reaction, by change in the nucleus of an atom. The source of nuclear energy is the mass of the nucleus and energy generated during a nuclear reaction is due to conversion of mass into energy (Einstein's Theory)

There are two ways to obtain nuclear energy:

1) Nuclear fission and 2) Nuclear fusion.

In a **nuclear fission reaction**, the nucleus of a heavy radioactive element like uranium, plutonium or thorium splits up into smaller nuclei, when bombarded by low energy neutrons. A huge amount of heat is generated in this process, which is used in nuclear power plants to generate electricity.

Nuclear fusion reaction involves the combination or fusion of two light elements to form a heavier element and release uncontrollable energy. Thus it cannot be used to generate electricity, unlike fission reaction. Did you know that the sun's energy is generated by nuclear fusion reaction? The heat and light that we get from

Sun, is all due to the continuous reactions going on inside it. We can now imagine how much energy would be released in the nuclear fusion reaction, that it is the source of sun's energy.

Let's cut out the technical part behind nuclear power and discuss advantages and disadvantages of nuclear energy, starting with advantages.

Advantages of Nuclear Energy

- 1) As compared to other conventional energy sources, Nuclear power produces **very less amount of pollution**.
- 2) **Very small amount of raw material** is required to generate huge amount of nuclear energy. To put it into perspective, about 28gm of Uranium releases as much amount of energy as is generated by 100 metric tonnes of coal.
- 3) Since they are required in small quantities, atomic materials can be easily transported to far-off places even at a global scale. Thus **transportation is easy** unless you are considering security part of it.
- 4) If nuclear power stations are operated upto their full capacity they can produce **cheap electricity** and gain from other benefits of Nuclear energy.
- 5) The quantity of nuclear **waste produced is also small**. Cons of this advantage are discussed in Disadvantages of Nuclear Energy.
- 6) It is a very **reliable** source of energy. The average life span of a nuclear reactor

is approx. 40 years which can be extended upto 60 years.

7) Nuclear power stations are usually very **compact** compared to thermal stations.

8) Although the initial capital cost of building a nuclear plant is high, the maintenance and running costs are relatively low.

Nuclear power has great prospects in the near future as nuclear power plants are efficient and do not produce any kind of pollution, unlike other sources. All in all, if nuclear energy is implemented extensively and its potential is exploited well, it would bring down the use of other important conventional sources of energy.

Source: <http://www.ianswer4u.com/2011/12/nuclear-energy-advantages-of-nuclear.html#axzz3Qs5RV0Sb>