

# NUCLEAR ENERGY

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*This essay will tell you about nuclear energy, how it is harnessed, and what all materials are used to harness this energy with the negatives and the positives of using it. Text will be highlighted at places where the information provided from the source is important and which are important points to understand the topic.*

*I have also learnt a lot from this essay by the research done to write it. As a briefing on nuclear energy, it produces nearly 800 billion kilowatts hours of electricity and this avoids around 470 million metric tons of carbon each year, equivalent to removing 100 million cars of the road. It is beneficial as well as dangerous.*

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Nuclear energy is the energy in the nucleus of an atom. There is high energy in the nucleus of an atom. This high energy holding the nucleus together is called **strong force**. Nuclear energy can be used to create electricity. In order to take this energy from the atom we use a process called **nuclear fission**, in which we split atoms to release the energy. A nuclear reactor is a series of machines which controls nuclear fission.

Uranium atoms are used as fuel in nuclear reactors. Mined uranium is converted into **U-235** as its atoms split easily. In a nuclear reactor atoms forced to break away from each other and as they split they release tiny particles called fission products which cause other uranium atoms to split. The heat generated from this warms the reactor's cooling agent (**generally cold water**), it produces steam which turns the turbines which drive generators to produce electricity.

Rods of a material called **nuclear poison** control the amount of electricity produced. Nuclear poison is a type of xenon which absorbs some of the fission products produced. If more rods (of nuclear poison) are present in the reaction, the reaction will be more controlled and slower.

**Nuclear energy is not considered a renewable source of energy as it is highly dependent on mining but it can be considered as a climate change solution as it does not produce any of the greenhouse gases.**

The future of the process to generate nuclear energy is **nuclear fusion** as it can deliver more energy more safely and produces much less nuclear waste.

**There are many dangers to nuclear energy** such as, the reactors are generally located near seas (as they use water as the cooling agent) which creates the problem of storms on the coastline which may destroy the reactor and a lot of radioactive waste will be released making the land inhospitable. How to store the nuclear waste is also an issue which stays **dangerously radioactive** of thousands of years.

**Source credit:**

**Given data has been taken from “nuclear energy | National Geographic Society” (nationalgeographic.org).**

**<https://www.nationalgeographic.org/encyclopedia/nuclear-energy/>**

**And Nuclear energy facts and information also from nationalgeographic.com.**

**<https://www.nationalgeographic.com/environment/article/nuclear-energy#:~:text=Nuclear%20power%20is%20generated%20by,to%20a%20generator%2C%20producing%20electricity>**

**And lastly, Advantages and challenges of nuclear energy from Office of Nuclear Energy (ENERGY.GOV).**

**<https://www.energy.gov/ne/articles/advantages-and-challenges-nuclear-energy#:~:text=Advantages%20of%20Nuclear%20Energy,-Clean%20Energy%20Source&text=It%20generates%20nearly%20800%20billion,cars%20off%20of%20the%20road.>**