



## Nuclear fusion energy

### Description

#### Theme:

- Recently, scientists at a US Federal Research facility were successful in conducting a controlled nuclear fusion reaction which produced more energy than it consumed. This created the possibility of an endless supply of energy.

#### What is Nuclear Fusion:

- Nuclear fusion is the process of combining nuclei of two lighter elements with each other to form the nucleus of a heavier atom. This is the same process that happens inside the sun.
- At the moment every nuclear plant harnesses energy through nuclear fission, where it breaks an atom into smaller parts, releasing energy in the process.

#### Why is it important:

- The energy that is released in the process of nuclear fusion is clean without any CO2 or other harmful atmospheric emissions.
- It also does not release any radiation, which means there is no chance of a nuclear meltdown.
- It has the potential to provide limitless energy.
- The net addition of the energy harnessed from this process is much larger in quantity.
- Power generated from nuclear fusion is much more efficient than power generated from fossil fuels, as it produces more energy per unit.
- As this is a cleaner form of fuel, its usage can be much more diverse, ranging from seawater desalination to medical applications.
- It can help in reducing the world's reliance on fossil fuels and improve its energy security.
- No material that is used in the process of nuclear fusion can be made into a nuclear weapon due to zero radiation.



- With more investment and more research in this field, the cost of performing this reaction will reduce, which will make energy cheaper for everyone.

### Challenges:

- This is a new technology which will need time to be commercialized.
- Nuclear fusion is a much more difficult process to do.
- The recent Nuclear fusion breakthrough was done on a very small scale. Performing this on a larger scale is yet another challenge.
- Currently, the cost of developing a fusion reactor is very high.
- Nuclear fusion reaction requires extremely high temperatures of above 5000 degree Celsius, in order to fuse the two nuclei together. This makes it a challenge to initiate and sustain the process.
- Because of the high temperatures required, it can be difficult to perform fusion reactions for long periods of time.

### Ways to help overcome the challenges:

- Governments need to increase their investment in the research and development of nuclear fusion. Countries can partner with each other to achieve this.
- Private companies and governments need to work together to bring more investment in this field. Many challenges to the process of nuclear fusion can be overcome with the help of private research firms.

### Conclusion:

The nuclear fusion breakthrough is probably the most important and exciting event to happen in the year 2022. But it is still in the early stage of development and will take probably a decade or two to become a viable source of energy. If scientists are able to find solutions to the challenges, it can revolutionize the way energy is used. As this is cleaner than the traditional source of energy, much safer than any existing nuclear reactors and has the potential to produce limitless energy, it can solve many existing challenges the world is facing right now.

### Your Turn...

What's your take on Nuclear fusion energy? Express your point of view through the comment section below. And subscribe to our blog to read answers to the trending GD topics.

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