

Fusion Energy Market Reflect Impressive Growth Rate to During 2040

Fusion Energy Market Expected to Reach \$840.3 Billion by 2040 — Allied Market Research

PORTLAND, OREGON, UNITED STATE, May 2, 2023 /EINPresswire.com/ -- The [fusion energy market](#) is gaining worldwide attention from private billionaires to governments and institutions. The investments are pouring in for research and development activities and for conducting experiments. However, the market is in the nascent stage, and many executives advocating fusion energy as the future of power generation are claiming to have the process ready by end of this decade. The market is being encouraged owing to support from the government as well which is in continuous pursuit of finding clean energy sources with little to no carbon emissions. The fusion energy market is estimated to be \$429.6 billion in 2030, and is projected to reach \$840.3 billion by 2040, growing at a CAGR of 7.1% from 2031 to 2040.

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The fusion reaction can occur when two or more light nuclei fuse together. It can be achieved in gaseous form, where gases are heated at very high temperatures. At high temperature, the nucleus separates from its atoms. The two atoms must overcome electrostatic repulsion. The heating causes atom to become an ion and free its electrons and this ionization can only be achieved after they are subjected to high kinetic energy in form of heat. The cloud of ions and loose electrons known as plasma are magnetic in nature and thus can be controlled. There are different technologies on which the fusion energy generation experiments are being done such as magnetic confinement, inertial confinement, magneto-inertial, electrostatic hybrid, and Muon-catalyzed fusion. Most worked on technologies are inertial and magnetic confinement.

The fusion reaction requires fuel that are abundantly available on earth which are light element isotopes specifically of hydrogen. They are deuterium/tritium, deuterium, deuterium, helium-3, and proton boron. These fuel can be derived from water and lithium which are available in huge quantity. A few grams of deuterium and tritium can create terajoules of energy which is huge compared to what are produced at present.

The initial cost for building the fusion reactor plant or system is high. The capital investments that will be required to produce fuel, eliminate radioactive waste, and maintenance will be high. The high cost for same is projected to lower once the process is established and fully functional.

Electric generation in nuclear reactors is more economical than that of gas, oil, and coal plants, and we can state that it is a cost-competitive source of energy.

Nuclear power plants emit only negligible volumes of carbon dioxide into the atmosphere, and their nuclear fuel chain reaction does not return radioactive wastes. The radioactive waste made with fusion is not the same as the fission reaction. The vessel wall is the only part that the high-energy neutrons will bombard. The activated materials need to be stored carefully for centuries which will only add to maintenance costs. The aforementioned reason discourages the fusion energy market growth.

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Deuterium alone is used as fuel and also for creating fusion energy where deuterium-deuterium (d-d) fuse together. It requires a temperature of around 400-500 million degrees Celsius. When deuterium fuses with deuterium and forms helium-4 and thus the reaction produces lots of energy. The energy produced from deuterium atoms fuses together. This fuel is considered as a highly potential fuel for a fusion reactor, a gallon of seawater could produce as much energy as 300 gallons of gasoline. However, the energy produced is relatively lower and thus the combination with other nuclei is preferred over d-d fusion.

The ITER laboratory situated in France is set to conduct series of experiments that will further Europe's position in the market. Furthermore, new entrants in the market are majorly from Europe and are capable of securing fundings. This acts as driving factor for the fusion energy market growth in the region.

The fusion energy market analysis is done on the basis of technology, fuel, and region. By technology, the market is divided into inertial confinement and magnetic confinement. Depending on fuel, the market is divided into deuterium/tritium, deuterium, deuterium-helium 3, and proton boron. Region-wise, it is analyzed across North America, Europe, Asia-Pacific, and LAMEA (Latin America, Middle East, and Africa).

By technology, the magnetic confinement approach towards producing fusion energy will dominate the experiment and is expected to grow during the fusion energy market forecast period. This is because magnetic fields are ideal for confining a plasma because the separated ions and electrons follow the magnetic field lines due to their electrical charges.

By fuel, deuterium dominated the market and is expected to grow at an even higher pace. This can be attributed to the fact that it can be extracted cheaply from seawater and the total amount of deuterium present in one liter of water is capable of producing enough energy that equals to the combustion energy from 300 liters of oil.

By region, North America is expected to dominate the market, however, Europe is projected to grow during the projection period owing to increased activities, experiments, new entrants, and

series funding in the region for fusion energy market opportunities.

Key market players in fusion energy industry are Agni Fusion Energy, TAE Technologies, Helion Energy, Commonwealth Fusion Systems, General Fusion, Tokamak Energy, Zap Energy, First Light Fusion, Lockheed Martin, Hyperjet Fusion, Marvel Fusion, HB11, Renaissance Fusion, and Kyoto Fusioneering.

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Key findings of the study:

- Magnetic confinement is projected to grow at the highest CAGR of approximately 7.2%, in terms of revenue, during the fusion energy market forecast period
- Deuterium/tritium fuel is projected to grow at a CAGR of 7.2% over the projection period
- The North America region is expected to dominate the fusion energy market share by over 66.7% in 2030
- A comprehensive analysis of the factors that drive and restrain the fusion energy market growth is provided.
- The qualitative data in this report aims at the fusion energy market trends, and developments in the industry

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