

# **Nuclear Fusion and Advanced Materials: Emerging Opportunities**

https://marketpublishers.com/r/NE9F5D9DA378EN.html

Date: October 2023

Pages: 144

Price: US\$ 5,500.00 (Single User License)

ID: NE9F5D9DA378EN

## **Abstracts**

#### Report Scope:

The report provides an overview of the nuclear fusion market and analyzes market trends. The nuclear fusion market is through in the stages of R&D, and from the fusion company's information it is expected to be commercialized between 2032 to 2038. Hence, 2035 is considered as the base year, and the report provides market data for the forecast period 2036 through 2040 by estimating values derived from manufacturers. Revenue forecasts for this period are segmented based on technology, application, and geography.

The report also includes a section on the major players in the market. Further, it explains the major drivers, competitive landscape, and current trends of the nuclear fusion market. The report concludes with a focus on the nuclear fusion vendor landscape and includes profiles of the major players operating in the global market.

#### Report Includes:

14 data tables and 53 additional tables

An overview of global market outlook for nuclear fusion and advanced materials

Analyses of global market trends, with data from 2035-2040, and projections of compound annual growth rates (CAGRs) through 2040

An identification of market trends, issues and forecasts impacting the global market and a breakdown of the market based on type, technology, and region



An outline of the recent technological advances in certain advanced materials and their use in the commercialization of nuclear fusion power over the next few decades

Coverage of nuclear fusion regulations across several countries, government funded projects, start-ups in nuclear fusion, and alternative energy investments opportunities in the oil & gas industry

A discussion of the key advanced materials, the technologies related to fusion power, and their current and future potential

Company profiles of major players within the industry, including Commonwealth Fusion Systems, First Light Fusion Ltd, General Fusion Inc., HB11 Energy Holdings Pty Ltd, and Marvel Fusion GmbH



## **Contents**

#### **CHAPTER 1 INTRODUCTION**

Overview

Study Goals and Objectives

Reasons for Doing This Study

Scope of Report

What's New in this Update?

Methodology

Information Sources

Geographic Breakdown

#### **CHAPTER 2 SUMMARY AND HIGHLIGHTS**

Market Outlook

#### **CHAPTER 3 MARKET AND TECHNOLOGY OVERVIEW**

**Nuclear Fusion History** 

Nuclear Fusion Regulations by Country

U.S.

U.K.

France

Germany

Russia

China

South Korea

Analysis of the Abovementioned Regulations

Value Chain Analysis of the Nuclear Fusion Industry

Research & Development

Component and Fuel Suppliers

System Integrators/Nuclear Fusion Companies

Potential Industry Applications

Patent Analysis

#### **CHAPTER 4 MARKET DYNAMICS**

**Market Drivers** 



Increased Funding by Top Venture Capitalist and Other Private Investors

Increase in Government Funded Projects

Growing Number of Start-ups in Nuclear Fusion

Growing Need for Additional Amount of Energy and Zero Carbon Energy

Market Opportunities

Alternative Energy Investments Opportunities in the Oil & Gas Industry

Growth Potential for Space Industry

Integration of Artificial intelligence (AI) and Machine Learning (ML) Technologies for

**Nuclear Fusion** 

Market Challenges

High Capital Costs for Constructing and Commissioning of Nuclear Fusion Facilities

Issues Faced by Plasma Heating, Confinement, and Stability

Low Availability of Tritium

Regulation and Licensing of Commercial Fusion Energy Facilities

#### CHAPTER 5 MARKET BREAKDOWN BY TECHNOLOGY

Overview

Magnetic Confinement Fusion

**Inertial Confinement Fusion** 

Magneto Inertial Fusion

#### CHAPTER 6 MARKET BREAKDOWN BY APPLICATION

Overview

**Electricity Generation** 

**Space Propulsion** 

Others (Marine Propulsion, Medical, Off-Grid Energy, Hydrogen and/or Clean Fuels,

Industrial Heating)

### **CHAPTER 7 MARKET BREAKDOWN BY REGION**

Overview

North America

U.S.

Canada

Mexico

Europe

Germany



U.K.

France

Italy

Spain

Rest of Europe

**APAC** 

China

Japan

India

**Thailand** 

Rest of APAC

Rest of the World

## **CHAPTER 8 COMPETITIVE LANDSCAPE**

Strategic Analysis

Recent Key Developments

Competitive Analysis

Analysis on Alternative Power Generation Technologies

Time by Proof-of-Concept to Early Commercialization for Energy Technologies

Is Small Modular Reactor (SMR) a Threat for Nuclear Fusion?

#### **CHAPTER 9 COMPANY PROFILES**

AVALANCHE ENERGY DESIGNS LLC

COMMONWEALTH FUSION SYSTEMS (CFS)

**CTFUSION** 

EX-FUSION INC.

**FOCUSED ENERGY** 

FIRST LIGHT FUSION LTD

GENERAL FUSION INC.

HB11 ENERGY HOLDINGS PTY LTD

HELION ENERGYINC.

MARVEL FUSION GMBH

MAGNETO-INERTIAL FUSION TECHNOLOGIES INC. (MIFTI)

PRINCETON FUSION SYSTEMS INC.

TAE TECHNOLOGIES INC.

TOKAMAK ENERGY LTD.

ZAP ENERGY INC.



#### **CHAPTER 10 APPENDIX: ACRONYMS**

#### 12. LIST OF TABLES

Summary Table : Global Market for Nuclear Fusion Technologies, by Region, Through 2040

Table 1: Notable Developments in the Timeline of Nuclear Fusion, 1950-2022

Table 2: Principal Regulations Currently Applicable to Fusion R&D in the U.K.

Table 3: Principal Regulations Currently Applicable to Fusion R&D in France

Table 4: Principal Regulations Currently Applicable to Fusion in China

Table 5: 12. List of Component Manufacturer and Headquarters

Table 6: Global Market for Nuclear Fusion Technologies, by Type, Through 2040

Table 7: Three Key Technologies of Fusion and Their Challenges

Table 8 : Global Market for Nuclear Fusion Technologies, by Application, Through 2040

Table 9: Global Projections of Electricity Consumption, by Energy Source, 2025-2050

Table 10: Global Market for Electricity Generation by Nuclear Fusion, by Region,

Through 2040

Table 11: Global Market for Nuclear Fusion Space Propulsion Systems, by Region,

Through 2040

Table 12: Global Market for Other Applications of Nuclear Fusion Technologies, by

Region, Through 2040

Table 13: Global Nuclear Fusion Expected Commercialisation and Capacity, by

Country

Table 14: Global Market for Nuclear Fusion Technologies, by Region, Through 2040

Table 15: U.S. Nuclear Fusion Device Status and Design Stage, by Device and

Organization

Table 16: Canadian Nuclear Fusion Device Status and Design Stage, by Device and

Organization

Table 17: Summary of Personnel and Institutions in Canada for Nuclear Research

Table 18: North American Market for Nuclear Fusion Technologies, by Application,

Through 2040

Table 19: North American Market for Nuclear Fusion Technologies, by Country,

Through 2040

Table 20: German Nuclear Fusion Device Status and Design Stage, by Device and

Organization

Table 21: U.K. Nuclear Fusion Device Status and Design Stage, by Device and

Organization

Table 22: French Nuclear Fusion Device Status and Design Stage, by Device and



## Organization

Table 23: Italian Nuclear Fusion Device Status and Design Stage, by Device and Organization

Table 24 : Spanish Nuclear Fusion Device Status and Design Stage, by Device and Organization

Table 25: Rest of European Nuclear Fusion Device Status and Design Stage, by Device and Organization

Table 26: European Market for Nuclear Fusion Technologies, by Application, Through 2040

Table 27: European Market for Nuclear Fusion Technologies, by Country, Through 2040

Table 28 : Chinese Nuclear Fusion Device Status and Design Stage, by Device and Organization

Table 29 : Japanese Nuclear Fusion Device Status and Design Stage, by Device and Organization

Table 30 : Indian Nuclear Fusion Device Status and Design Stage, by Device and Organization

Table 31: Thai Nuclear Fusion Device Status and Design Stage, by Device and Organization

Table 32 : Rest of APAC Nuclear Fusion Device Status and Design Stage, by Device and Organization

Table 33: APAC Market for Nuclear Fusion Technologies, by Application, Through 2040

Table 34 : APAC Market for Nuclear Fusion Technologies, by Country, Through 2040

Table 35 : South American Nuclear Fusion Device Status and Design Stage, by Device and Organization

Table 36: RoW Market for Nuclear Fusion Technologies, by Application, Through 2040

Table 37 : Recent Key Developments, 2022 and 2023\*

Table 38: Nuclear Fusion Companies Expected Capacity Generation

Table 39 : Avalanche Energy Designs LLC: Company Snapshot

Table 40 : Commonwealth Fusion Systems: Company Snapshot

Table 41 : Commonwealth Fusion Systems: Recent Developments

Table 42 : CTFusion: Company Snapshot

Table 43: EX-Fusion Inc.: Company Snapshot

Table 44 : EX-Fusion Inc.: Recent Developments

Table 45 : Focused Energy: Company Snapshot

Table 46 : Focused Energy: Recent Developments

Table 47 : First Light Fusion Ltd: Company Snapshot

Table 48: First Light Fusion Ltd: Recent Developments



Table 49: General Fusion Inc.: Company Snapshot

Table 50 : General Fusion Inc.: Recent Developments

Table 51: HB11 Energy Holdings Pty Ltd: Company Snapshot

Table 52: HB11 Energy Holdings Pty Ltd: Recent Developments

Table 53: Helion Energy Inc.: Company Snapshot

Table 54: Helion Energy Inc.: Recent Developments

Table 55: Marvel Fusion GmbH: Company Snapshot

Table 56: Marvel Fusion GmbH: Recent Developments

Table 57: MIFTI: Company Snapshot

Table 58: Princeton Fusion Systems Inc.: Company Snapshot

Table 59: Princeton Fusion Systems Inc.: Recent Developments

Table 60: TAE Technologies Inc.: Company Snapshot

Table 61: TAE Technologies Inc.: Recent Developments

Table 62: Tokamak Energy Ltd: Company Snapshot

Table 63: Tokamak Energy Ltd: Recent Developments

Table 64: Zap Energy Inc.: Company Snapshot

Table 65 : Zap Energy Inc.: Recent Developments

Table 66: Acronyms Used in This Report

#### 12. LIST OF FIGURES

Summary Figure : Global Market Shares of Nuclear Fusion Technologies, by Region, 2035

Figure 1: Comparison between Prescriptive and Goal-Setting Approaches

Figure 2: Nuclear Fusion Industry Market Value Chain

Figure 3: Global Patent Applications on Nuclear Fusion Technologies, 2016-2022

Figure 4: Global Shares of Patent Applications on Nuclear Fusion Technologies, by Region, 2021

Figure 5: Key Drivers Fueling the Growth of the Market for Nuclear Fusion Technologies

Figure 6: Funds Raised, by Nuclear Fusion Companies, Till 2022

Figure 7: Shares of Funds Raised, by Nuclear Fusion Companies, Through 2022

Figure 8: Roadmap and Expected Timeline for ITER Project

Figure 9: Number of New Nuclear Fusion Start-ups, 2017-2022

Figure 10: Global Total Primary Energy Consumption Projections, 2020-2050

Figure 11: Global Projections of Shares of Primary Energy Consumption, by Energy

Source, 2050

Figure 12: Oil Supply in the Net Zero Pathway, 2020 & 2050

Figure 13: Key Opportunities the Market for Nuclear Fusion Technologies



- Figure 14: Oil & Gas Company Investments in Nuclear Fusion Power
- Figure 15: Major Challenges Faced by Nuclear Fusion Power Plant Facilities
- Figure 16: Shares of the Cost for Magnetic Confinement Fusion Reactors
- Figure 17: Regulatory Hazards of Particular Concern for Commercial Fusion Facilities
- Figure 18: Global Market Shares of Nuclear Fusion Technologies, by Type, 2035
- Figure 19: Global Market Shares of Nuclear Fusion Technologies, by Type, 2040
- Figure 20 : Global Market Shares of Nuclear Fusion Technologies, by Application, 2035
- Figure 21: Global Market Shares of Nuclear Fusion Technologies, by Application, 2040
- Figure 22 : Global Projections of Electricity Consumption, by Energy Source, 2025-2050
- Figure 23: Global Market Shares of Electricity Generation by Nuclear Fusion, by Region, 2035
- Figure 24 : Global Market Shares of Electricity Generation by Nuclear Fusion, by Region, 2040
- Figure 25 : Global Market Shares of Nuclear Fusion Space Propulsion Systems, by Region, 2035
- Figure 26 : Global Market Shares of Nuclear Fusion Space Propulsion Systems, by Region, 2040
- Figure 27 : Global Market Shares of Other Applications of Nuclear Fusion Technologies, by Region, 2035
- Figure 28 : Global Market Shares of Other Applications of Nuclear Fusion Technologies, by Region, 2040
- Figure 29: Global Market Shares of Nuclear Fusion Companies, by Region, 2022
- Figure 30 : Global Market Shares of Nuclear Fusion Technologies, by Region, 2035
- Figure 31: Global Market Shares of Nuclear Fusion Technologies, by Region, 2040
- Figure 32 : U.S. Market Shares of Electricity Generation, by Energy Source, 2022 and 2050
- Figure 33 : Canadian Market Shares of Electricity Generation, by Energy Source, 2022 and 2050
- Figure 34: Mexican Market Shares of Electricy Generation, by Energy Source, 2021
- Figure 35: North American Market Shares of Nuclear Fusion Technologies, by Application, 2035
- Figure 36: North American Market Shares of Nuclear Fusion Technologies, by Application, 2040
- Figure 37: North American Market Shares of Nuclear Fusion Technologies, by Country, 2035
- Figure 38: North American Market Shares of Nuclear Fusion Technologies, by Country, 2040
- Figure 39: European Market Shares of Nuclear Fusion Projects by Public (Government and Institutions) and Private Organizations, 2022



- Figure 40: German Market Shares of Electricy Generation, by Energy Source, 2021
- Figure 41: U.K. Market Shares of Electricy Generation, by Energy Source, 2021
- Figure 42: French Market Shares of Electricy Generation, by Energy Source, 2021
- Figure 43: Italian Market Shares of Electricy Generation, by Energy Source, 2021
- Figure 44: Spanish Market Shares of Electricy Generation, by Energy Source, 2021
- Figure 45: European Market Shares of Nuclear Fusion Technologies, by Application, 2035
- Figure 46: European Market Shares of Nuclear Fusion Technologies, by Application, 2040
- Figure 47: European Market Shares of Nuclear Fusion Technologies, by Country, 2035
- Figure 48: European Market Shares of Nuclear Fusion Technologies, by Country, 2040
- Figure 49 : APAC Market Shares of Nuclear Fusion Projects, by Public (Government and Institutions) and Private Organizations, 2022
- Figure 50 : Chinese Market Shares of Electricy Generation, by Energy Source, 2022 and 2050
- Figure 51: Japanese Market Shares of Electricy Generation, by Energy Source, 2022 and 2050
- Figure 52 : Indian Market Shares of Electricy Generation, by Energy Source, 2022 and 2050
- Figure 53: Thai Market Shares of Electricy Generation, by Energy Source, 2022 and 2050
- Figure 54: APAC Market Shares of Nuclear Fusion Technologies, by Application, 2035
- Figure 55: APAC Market Shares of Nuclear Fusion Technologies, by Application, 2040
- Figure 56: APAC Market Shares of Nuclear Fusion Technologies, by Country, 2035
- Figure 57: APAC Market Shares of Nuclear Fusion Technologies, by Country, 2040
- Figure 58: RoW Market Shares of Nuclear Fusion Projects, by Public (Government and Institutions) and Private Organizations, 2022
- Figure 59: RoW Market Shares of Nuclear Fusion Technologies, by Application, 2035
- Figure 60: RoW Market Shares of Nuclear Fusion Technologies, by Application, 2040
- Figure 61: Shares of Strategic Approaches Adopted, by Nuclear Fusion Companies, 2021-2023\*
- Figure 62: Shares of Nuclear Fusion Companies, by Technology, 2022
- Figure 63: Shares of Nuclear Fusion Companies, by Fuel Type, 2022
- Figure 64: Nuclear Fusion Companies Funding Range, 2021 and 2022
- Figure 65: Shares of Capacity Factor for U.S., by Energy Source, 2021
- Figure 66: Average External Costs of Selected Energy Sources
- Figure 67: Average Capital Investment Required, by Energy Sources
- Figure 68: Average LCOE, by Energy Sources
- Figure 69: Time by Proof-of-Concept to Early Commercialization for Energy



Technologies



#### I would like to order

Product name: Nuclear Fusion and Advanced Materials: Emerging Opportunities

Product link: https://marketpublishers.com/r/NE9F5D9DA378EN.html

Price: US\$ 5,500.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer

Service:

info@marketpublishers.com

## **Payment**

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <a href="https://marketpublishers.com/r/NE9F5D9DA378EN.html">https://marketpublishers.com/r/NE9F5D9DA378EN.html</a>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:	
Last name:	
Email:	
Company:	
Address:	
City:	
Zip code:	
Country:	
Tel:	
Fax:	
Your message:	
	**All fields are required
	Custumer signature

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at <a href="https://marketpublishers.com/docs/terms.html">https://marketpublishers.com/docs/terms.html</a>

To place an order via fax simply print this form, fill in the information below and fax the completed form to +44 20 7900 3970