

Global Planar Solid Oxide Fuel Cell Market Size Study & Forecast, by Power Output (Below 300 kW, 300 kW to 1 MW, 1 to 3 MW, Above 3 MW), by Application (Power Generation, Cogeneration), and Regional Forecasts 2025-2035

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Abstracts

The Global Planar Solid Oxide Fuel Cell (SOFC) Market is valued at approximately USD 9.13 billion in 2024 and is projected to grow with a staggering compound annual growth rate (CAGR) of 25.83% throughout the forecast period from 2025 to 2035. Emerging as a disruptive solution to decarbonization challenges and the pursuit of energy efficiency, planar SOFCs are engineered to convert chemical energy from fuel into electricity with unmatched efficiency and minimal emissions. As governments and industries shift focus toward sustainable and resilient energy systems, the adoption of solid oxide fuel cell technologies, particularly planar configurations, is gaining serious traction. These systems are increasingly integrated into distributed energy resources, microgrids, and industrial backup power applications due to their scalability, fuel flexibility, and long-term cost-effectiveness.

The soaring demand for clean energy sources and grid-independent power generation systems has significantly propelled the relevance of planar SOFCs across critical sectors. Whether in utility-scale installations or residential cogeneration units, planar SOFCs deliver low-noise, high-efficiency solutions that can operate on hydrogen, natural gas, and biogas—catering to both transitional and net-zero energy strategies. Moreover, as industrial stakeholders continue to pivot toward low-carbon operations, the superior thermal and electrical output of these systems renders them particularly attractive. Breakthroughs in electrolyte materials like scandia-stabilized zirconia and advancements in modular Balance of Plant (BoP) technologies are also broadening their commercial viability by improving durability and reducing system integration

complexity. However, the market still faces headwinds from high upfront costs and complex thermal management, especially in high-output configurations.

Regionally, North America is poised to maintain its dominance in the planar SOFC market, largely due to aggressive decarbonization policies, rising hydrogen economy initiatives, and substantial investment in distributed energy infrastructure. The U.S. in particular has become a hub for innovation in solid oxide technology, with widespread deployment across residential, defense, and data center ecosystems. Meanwhile, Asia Pacific is emerging as the fastest-growing regional market, driven by ambitious net-zero targets in countries like Japan, South Korea, and China. These nations are leveraging solid oxide systems to build resilient power networks, enhance energy security, and accelerate the transition to green hydrogen. Europe, too, remains an important contributor, owing to stringent emissions regulations, clean energy subsidies, and strong R&D frameworks supporting SOFC innovation.

Major market player included in this report are:

Bloom Energy Corporation

Aisin Seiki Co., Ltd.

Mitsubishi Power, Ltd.

Elcogen AS

Hexis AG

Ceres Power Holdings plc

Convion Ltd.

NGK Spark Plug Co., Ltd.

Doosan Fuel Cell Co., Ltd.

SOLIDpower Group

Sunfire GmbH

Watt Fuel Cell Corporation

FuelCell Energy, Inc.

Adelan Ltd.

AVL List GmbH

Global Planar Solid Oxide Fuel Cell Market Report Scope:

Historical Data – 2023, 2024

Base Year for Estimation – 2024

Forecast period – 2025–2035

Report Coverage – Revenue forecast, Company Ranking, Competitive Landscape, Growth factors, and Trends

Regional Scope – North America; Europe; Asia Pacific; Latin America; Middle East & Africa

Customization Scope – Free report customization (equivalent up to 8 analysts' working hours) with purchase. Addition or alteration to country, regional & segment scope*

The objective of the study is to define market sizes of different segments & countries in recent years and to forecast the values for the coming years. The report is designed to incorporate both qualitative and quantitative aspects of the industry within the countries involved in the study. The report also provides detailed information about crucial aspects, such as driving factors and challenges, which will define the future growth of the market. Additionally, it incorporates potential opportunities in micro-markets for stakeholders to invest, along with a detailed analysis of the competitive landscape and product offerings of key players. The detailed segments and sub-segments of the market are explained below:

By Power Output:

Below 300 kW

300 kW to 1 MW

1 to 3 MW

Above 3 MW

By Application:

Power Generation

Cogeneration

Auxiliary Power Systems

Transportation

By Electrolyte Material:

Yttria-stabilized Zirconia

Scandia-stabilized Zirconia

Ceria-Gadolinia Oxide

By Technology Type:

Balance of Plant Integrated

Balance of Plant Modular

Balance of Plant Independent

By Industry Vertical:

Residential

Commercial

Industrial

Utility

By Region:

North America

U.S.

Canada

Europe

UK

Germany

France

Spain

Italy

Rest of Europe

Asia Pacific

China

India

Japan

Australia

South Korea

Rest of Asia Pacific

Latin America

Brazil

Mexico

Middle East & Africa

UAE

Saudi Arabia

South Africa

Rest of Middle East & Africa

Key Takeaways:

Market Estimates & Forecast for 10 years from 2025 to 2035.

Annualized revenues and regional level analysis for each market segment.

Detailed analysis of geographical landscape with country-level analysis of major regions.

Competitive landscape with information on major players in the market.

Analysis of key business strategies and recommendations on future market

approach.

Analysis of competitive structure of the market.

Demand side and supply side analysis of the market.

Contents

CHAPTER 1. GLOBAL PLANAR SOLID OXIDE FUEL CELL MARKET REPORT SCOPE & METHODOLOGY

- 1.1. Research Objective
- 1.2. Research Methodology
 - 1.2.1. Forecast Model
 - 1.2.2. Desk Research
 - 1.2.3. Top Down and Bottom-Up Approach
- 1.3. Research Attributes
- 1.4. Scope of the Study
 - 1.4.1. Market Definition
 - 1.4.2. Market Segmentation
- 1.5. Research Assumption
 - 1.5.1. Inclusion & Exclusion
 - 1.5.2. Limitations
 - 1.5.3. Years Considered for the Study

CHAPTER 2. EXECUTIVE SUMMARY

- 2.1. CEO/CXO Standpoint
- 2.2. Strategic Insights
- 2.3. ESG Analysis
- 2.4. Key Findings

CHAPTER 3. GLOBAL PLANAR SOLID OXIDE FUEL CELL MARKET FORCES ANALYSIS

- 3.1. Market Forces Shaping The Global Planar SOFC Market (2024–2035)
- 3.2. Drivers
 - 3.2.1. Surging Demand for Clean and Decentralized Power Solutions
 - 3.2.2. Government Initiatives Supporting Hydrogen Infrastructure and Decarbonization
- 3.3. Restraints
 - 3.3.1. High Capital Investment and Costly Materials
 - 3.3.2. Operational Complexity in High-Temperature Environments
- 3.4. Opportunities
 - 3.4.1. Advancements in Electrolyte Materials and Stack Technology
 - 3.4.2. Integration of SOFCs with Emerging Hydrogen Economy

CHAPTER 4. GLOBAL PLANAR SOLID OXIDE FUEL CELL INDUSTRY ANALYSIS

- 4.1. Porter's 5 Forces Model
 - 4.1.1. Bargaining Power of Buyer
 - 4.1.2. Bargaining Power of Supplier
 - 4.1.3. Threat of New Entrants
 - 4.1.4. Threat of Substitutes
 - 4.1.5. Competitive Rivalry
- 4.2. Porter's 5 Force Forecast Model (2024–2035)
- 4.3. PESTEL Analysis
 - 4.3.1. Political
 - 4.3.2. Economical
 - 4.3.3. Social
 - 4.3.4. Technological
 - 4.3.5. Environmental
 - 4.3.6. Legal
- 4.4. Top Investment Opportunities
- 4.5. Top Winning Strategies (2025)
- 4.6. Market Share Analysis (2024–2025)
- 4.7. Global Pricing Analysis and Trends 2025
- 4.8. Analyst Recommendation & Conclusion

CHAPTER 5. GLOBAL PLANAR SOLID OXIDE FUEL CELL MARKET SIZE & FORECASTS BY POWER OUTPUT (2025–2035)

- 5.1. Market Overview
- 5.2. Below 300 kW
 - 5.2.1. Top Countries Breakdown Estimates & Forecasts, 2024–2035
 - 5.2.2. Market Size Analysis, by Region, 2025–2035
- 5.3. 300 kW to 1 MW
 - 5.3.1. Top Countries Breakdown Estimates & Forecasts, 2024–2035
 - 5.3.2. Market Size Analysis, by Region, 2025–2035
- 5.4. 1 to 3 MW
 - 5.4.1. Top Countries Breakdown Estimates & Forecasts, 2024–2035
 - 5.4.2. Market Size Analysis, by Region, 2025–2035
- 5.5. Above 3 MW
 - 5.5.1. Top Countries Breakdown Estimates & Forecasts, 2024–2035
 - 5.5.2. Market Size Analysis, by Region, 2025–2035

CHAPTER 6. GLOBAL PLANAR SOLID OXIDE FUEL CELL MARKET SIZE & FORECASTS BY APPLICATION (2025–2035)

6.1. Market Overview

6.2. Power Generation

6.2.1. Top Countries Breakdown Estimates & Forecasts, 2024–2035

6.2.2. Market Size Analysis, by Region, 2025–2035

6.3. Cogeneration

6.3.1. Top Countries Breakdown Estimates & Forecasts, 2024–2035

6.3.2. Market Size Analysis, by Region, 2025–2035

6.4. Auxiliary Power Systems

6.4.1. Top Countries Breakdown Estimates & Forecasts, 2024–2035

6.4.2. Market Size Analysis, by Region, 2025–2035

6.5. Transportation

6.5.1. Top Countries Breakdown Estimates & Forecasts, 2024–2035

6.5.2. Market Size Analysis, by Region, 2025–2035

CHAPTER 7. GLOBAL PLANAR SOLID OXIDE FUEL CELL MARKET SIZE & FORECASTS BY ELECTROLYTE MATERIAL (2025–2035)

7.1. Yttria-stabilized Zirconia

7.2. Scandia-stabilized Zirconia

7.3. Ceria-Gadolinia Oxide

CHAPTER 8. GLOBAL PLANAR SOLID OXIDE FUEL CELL MARKET SIZE & FORECASTS BY TECHNOLOGY TYPE (2025–2035)

8.1. Balance of Plant Integrated

8.2. Balance of Plant Modular

8.3. Balance of Plant Independent

CHAPTER 9. GLOBAL PLANAR SOLID OXIDE FUEL CELL MARKET SIZE & FORECASTS BY INDUSTRY VERTICAL (2025–2035)

9.1. Residential

9.2. Commercial

9.3. Industrial

9.4. Utility

CHAPTER 10. GLOBAL PLANAR SOLID OXIDE FUEL CELL MARKET SIZE & FORECASTS BY REGION (2025–2035)

10.1. Regional Market Snapshot

10.2. Top Leading & Emerging Countries

10.3. North America

10.3.1. U.S.

10.3.1.1. Power Output Breakdown Size & Forecasts, 2025–2035

10.3.1.2. Application Breakdown Size & Forecasts, 2025–2035

10.3.2. Canada

10.3.2.1. Power Output Breakdown Size & Forecasts, 2025–2035

10.3.2.2. Application Breakdown Size & Forecasts, 2025–2035

10.4. Europe

10.4.1. UK

10.4.2. Germany

10.4.3. France

10.4.4. Spain

10.4.5. Italy

10.4.6. Rest of Europe

10.5. Asia Pacific

10.5.1. China

10.5.2. India

10.5.3. Japan

10.5.4. Australia

10.5.5. South Korea

10.5.6. Rest of Asia Pacific

10.6. Latin America

10.6.1. Brazil

10.6.2. Mexico

10.7. Middle East & Africa

10.7.1. UAE

10.7.2. Saudi Arabia

10.7.3. South Africa

10.7.4. Rest of Middle East & Africa

CHAPTER 11. COMPETITIVE INTELLIGENCE

11.1. Top Market Strategies

- 11.2. Bloom Energy Corporation
 - 11.2.1. Company Overview
 - 11.2.2. Key Executives
 - 11.2.3. Company Snapshot
 - 11.2.4. Financial Performance (Subject to Data Availability)
 - 11.2.5. Product/Services Port
 - 11.2.6. Recent Development
 - 11.2.7. Market Strategies
 - 11.2.8. SWOT Analysis
- 11.3. Mitsubishi Power, Ltd.
- 11.4. Aisin Seiki Co., Ltd.
- 11.5. Ceres Power Holdings plc
- 11.6. NGK Spark Plug Co., Ltd.
- 11.7. Doosan Fuel Cell Co., Ltd.
- 11.8. FuelCell Energy, Inc.
- 11.9. Sunfire GmbH
- 11.10. Elcogen AS
- 11.11. Hexis AG
- 11.12. SOLIDpower Group
- 11.13. Convion Ltd.
- 11.14. AVL List GmbH
- 11.15. Watt Fuel Cell Corporation
- 11.16. Adelan Ltd.

List Of Tables

LIST OF TABLES

- Table 1. Global Planar Solid Oxide Fuel Cell Market, Report Scope
- Table 2. Market Estimates & Forecasts by Region (2024–2035)
- Table 3. Market Estimates & Forecasts by Power Output (2024–2035)
- Table 4. Market Estimates & Forecasts by Application (2024–2035)
- Table 5. Market Estimates & Forecasts by Electrolyte Material (2024–2035)
- Table 6. Market Estimates & Forecasts by Technology Type (2024–2035)
- Table 7. Market Estimates & Forecasts by Industry Vertical (2024–2035)
- Table 8. U.S. Market Estimates & Forecasts (2024–2035)
- Table 9. Canada Market Estimates & Forecasts (2024–2035)
- Table 10. UK Market Estimates & Forecasts (2024–2035)
- Table 11. Germany Market Estimates & Forecasts (2024–2035)
- Table 12. France Market Estimates & Forecasts (2024–2035)
- Table 13. Spain Market Estimates & Forecasts (2024–2035)
- Table 14. Italy Market Estimates & Forecasts (2024–2035)
- Table 15. Rest of Europe Market Estimates & Forecasts (2024–2035)
- Table 16. China Market Estimates & Forecasts (2024–2035)
- Table 17. India Market Estimates & Forecasts (2024–2035)
- Table 18. Japan Market Estimates & Forecasts (2024–2035)
- Table 19. Australia Market Estimates & Forecasts (2024–2035)
- Table 20. South Korea Market Estimates & Forecasts (2024–2035)
- Table 21. Brazil Market Estimates & Forecasts (2024–2035)
- Table 22. Mexico Market Estimates & Forecasts (2024–2035)
- Table 23. UAE Market Estimates & Forecasts (2024–2035)
- Table 24. Saudi Arabia Market Estimates & Forecasts (2024–2035)
- Table 25. South Africa Market Estimates & Forecasts (2024–2035)

List Of Figures

LIST OF FIGURES

- Figure 1. Global Planar Solid Oxide Fuel Cell Market, Research Methodology
- Figure 2. Market Estimation Techniques
- Figure 3. Global Market Size Estimation Model
- Figure 4. Key Trends in Planar SOFC Market (2025)
- Figure 5. Market Growth Prospects (2024–2035)
- Figure 6. Porter's Five Forces Model
- Figure 7. PESTEL Analysis
- Figure 8. Value Chain Analysis
- Figure 9. Market by Power Output (2025 & 2035)
- Figure 10. Market by Application (2025 & 2035)
- Figure 11. Market by Electrolyte Material (2025 & 2035)
- Figure 12. Market by Technology Type (2025 & 2035)
- Figure 13. Market by Industry Vertical (2025 & 2035)
- Figure 14. North America Market Outlook (2025 & 2035)
- Figure 15. Europe Market Outlook (2025 & 2035)
- Figure 16. Asia Pacific Market Outlook (2025 & 2035)
- Figure 17. Latin America Market Outlook (2025 & 2035)
- Figure 18. Middle East & Africa Market Outlook (2025 & 2035)
- Figure 19. Global Planar SOFC Market, Company Market Share Analysis (2025)

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