

Power-to-X Market Size, Share & Trends Analysis Report By Technology (Power-to-H2, Power-to-Methanol), By End-use (Agriculture, Manufacturing), By Region, And Segment Forecasts, 2023 - 2030

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Abstracts

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Power-to-X Market Growth & Trends

The global power-to-X market size is expected to reach USD 645.3 million by 2030, according to a new report by Grand View Research, Inc. It is expected to grow at a CAGR of 10.6% from 2023 to 2030. Power-to-X (P2X) technologies enable the integration of renewable energy sources, such as wind and solar, into sectors traditionally reliant on fossil fuels. This trend is expected to accelerate as countries increase their renewable energy capacity and reduce their dependence on fossil fuels. Simultaneously, the increasing deployment of renewable energy sources, such as wind and solar, provides a reliable and abundant source of electricity for power-to-X processes. As renewable energy costs continue to decline, the economic viability of power-to-X technologies improves.

An increasing number of industries across various sectors have recognized the potential of green hydrogen, which is generated via power-to-X processes. Green hydrogen, produced by utilizing renewable energy sources splitting water into hydrogen and oxygen, offers many applications and benefits. As the world struggles with the urgent need to mitigate climate change and reduce carbon emissions, green hydrogen has emerged as a critical solution in the transition toward a sustainable and decarbonized future. Green hydrogen presents a viable alternative, as it can be used in fuel cell electric vehicles (FCEVs) to power cars, trucks, and even trains, emitting only water

vapor as a byproduct.

Power-to-X processes have emerged as game-changers in producing synthetic fuels, chemicals, and materials supporting the ongoing efforts to mitigate climate change, reduce carbon emissions, and foster the adoption of carbon-neutral alternatives. The COVID-19 pandemic created various challenges and uncertainties, affecting the market dynamics and growth trajectory of power-to-X technologies. However, it has also presented opportunities for innovation and resilience in the crisis. A notable impact of the COVID-19 pandemic on the industry has been the disruption of supply chains. Travel restrictions, lockdown measures, and reduced economic activity have affected the availability and transportation of essential components and materials required for power-to-X processes.

This disruption has led to delays in project development and deployment, as well as increased costs and logistical challenges. COVID-19 has also demonstrated the importance of resilience, sustainability, and accelerating energy transition. Governments and international bodies have recognized the opportunity to align economic recovery efforts with clean energy investments and decarbonization goals. As part of stimulus packages and recovery plans, many countries have announced increased commitments to renewable energy and green technologies, including power-to-X solutions. This focus on sustainable recovery could significantly boost the power-to-X industry in the long term.

Power-to-X Market Report Highlights

The power-to-H2 segment led the market in 2022 accounting for over 40% of the global revenue owing to its capacity to integrate more renewable energy into these sectors, fostering the transition towards a low-carbon economy

The transportation segment held the largest revenue share of over 35% in 2022. Power-to-X technologies enable the production of low-carbon or carbon-neutral energy carriers, such as hydrogen or synthetic fuels, from renewable sources. Using these energy carriers, greenhouse gas emissions can be significantly reduced

The potential of power-to-X technologies in emerging transportation trends, such as hydrogen fuel cell vehicles, synthetic fuel, electric vehicles (EVs), and in shipping & aviation, with low carbon emissions, is immense

These technologies enable the integration of different industrial sectors within the energy system, fostering sector coupling. Excess electricity from renewable sources can be used to produce energy carriers, such as hydrogen, synthetic natural gas, or even synthetic liquid fuels, through power-to-gas or power-to-liquid processes

Europe held the largest revenue share of over 40% in 2022. As R&D efforts continue, the costs associated with PtX systems are expected to decline, making them more competitive and attractive for the European market

Contents

CHAPTER 1 METHODOLOGY AND SCOPE

- 1.1 Market Segmentation & Scope
- 1.2 Market Definitions
- 1.3 Information Procurement
 - 1.3.1 Information analysis
 - 1.3.2 Market Formulation & Data Visualization
 - 1.3.3 Data validation & publishing
- 1.4 Research Scope and Assumptions
 - 1.4.1 List to Data Sources

CHAPTER 2 EXECUTIVE SUMMARY

- 2.1 Market Snapshot
- 2.2 Segment Snapshot
- 2.3 Competitive Landscape Snapshot

CHAPTER 3 POWER-TO-X MARKET VARIABLES AND TRENDS

- 3.1 Market Lineage Outlook
- 3.2 Penetration & Growth Prospect Mapping
- 3.3 Industry Value Chain Analysis
- 3.4 Market Dynamics
 - 3.4.1 Market Driver Impact Analysis
 - 3.4.2 Market Restraint Impact Analysis
 - 3.4.3 Industry Challenges
 - 3.4.4 Industry Opportunities
- 3.5 Impact of the COVID-19 Pandemic
- 3.6 Industry Analysis Tools
 - 3.6.1 Porter's Analysis
 - 3.6.2 Macroeconomic Analysis

CHAPTER 4 POWER-TO-X MARKET: TECHNOLOGY ESTIMATES & TREND ANALYSIS

- 4.1 Power-to-X Market, by Technology: Key Takeaways
- 4.2 Technology Movement Analysis & Market Share, 2022 &

4.3 Power-to-X Market Estimates & Forecast, By Technology (Revenue USD Million)

- 4.3.1. Power-to-H2
- 4.3.2 Power-to-CO/Syngas/Formic Acid
- 4.3.3 Power-to-NH3
- 4.3.4 Power-to-Methane
- 4.3.5 Power-to-Methanol
- 4.3.6 Power-to-H2O2

CHAPTER 5 POWER-TO-X MARKET: END-USE ESTIMATES & TREND ANALYSIS

5.1 Power-to-X Market, by End-use: Key Takeaways

5.2 End-use Movement Analysis & Market Share, 2022 & 2030

5.3 Power-to-X Market Estimates & Forecast, By End-use (Revenue USD Million)

- 5.3.1 Transportation
- 5.3.2 Agriculture
- 5.3.3 Manufacturing
- 5.3.4 Industry
- 5.3.5 Residential
- 5.3.6 Others

CHAPTER 6 POWER-TO-X MARKET: REGIONAL ESTIMATES & TREND ANALYSIS

6.1 Power-to-X Market: Regional Outlook

6.2 North America

6.2.1 North America Power-to-X Market Estimates & Forecasts, 2017 - 2030 (Revenue USD Million)

6.2.2 U.S.

6.2.2.1 U.S. power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.2.3 Canada

6.2.3.1 Canada power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.3 Europe

6.3.1 Europe Power-to-X Market Estimates & Forecasts, 2017 - 2030 (Revenue USD Million)

6.3.2 UK

6.3.2.1 UK power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.3.3 Germany

6.3.3.1 Germany power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.3.4 France

6.3.4.1 France power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.4 Asia Pacific

6.4.1 Asia Pacific Power-to-X Market Estimates & Forecasts, 2017 - 2030 (Revenue USD Million)

6.4.2 China

6.4.2.1 China power-to-X hardware market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.4.3 Japan

6.4.3.1 Japan power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.4.4 India

6.4.4.1 India power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.4.5 South Korea

6.4.5.1 South Korea power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.4.6 Australia

6.4.6.1 Australia power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.5 Latin America

6.5.1 Latin America Power-to-X Market Estimates & Forecasts, 2017 - 2030 (Revenue USD Million)

6.5.2 Brazil

6.5.2.1 Brazil power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.5.3 Mexico

6.5.3.1 Mexico power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.6 Middle East & Africa

6.6.1 Middle East & Africa Power-to-X Market Estimates & Forecasts, 2017 - 2030 (Revenue USD Million)

6.6.2 KSA

6.6.2.1 KSA power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.6.3 UAE

6.6.3.1 UAE power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

6.6.4 South Africa

6.6.4.1 South Africa power-to-X market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

CHAPTER 7 POWER-TO-X MARKET - COMPETITIVE LANDSCAPE

7.1 Recent Developments & Impact Analysis, By Key Market Participants

7.2 Company Categorization

7.3 Participant's Overview

7.4 Financial Performance

7.5 Product Benchmarking

7.6 Power-to-X Market -Company Market Share Analysis, 2022

7.7 Company Heat Map Analysis

7.8 Strategy Mapping

7.8.1 Expansion

7.8.2 Mergers & Acquisition

7.8.3 Collaborations

7.8.4 New Product Launches

7.8.5 Research & Development

7.9 Company Profiles/Listing

7.9.1 Air Liquide

7.9.2 Linde

7.9.3 Siemens Energy

7.9.4 Mitsubishi Hitachi Power Systems

7.9.5 HPEM2GAS

7.9.6 Thyssenkrupp

7.9.7 IRENA

7.9.8 Neles

7.9.9 Weidmüller

7.9.10 Copenhagen Infrastructure Partners

7.9.11 Alfa Laval

List Of Tables

LIST OF TABLES

Table 1 Global power-to-X market size estimates & forecasts, 2017 - 2030 (USD Million)

Table 2 Global power-to-X market, by region, 2017 - 2030 (USD Million)

Table 3 Global power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 4 Power-to-H2 power-to-X market, by region, 2017 - 2030 (USD Million)

Table 5 Power-to-CO/Syngas/Formic Acid power-to-X market, by region, 2017 - 2030 (USD Million)

Table 6 Power-to-NH3 power-to-X market, by region, 2017 - 2030 (USD Million)

Table 7 Power-to-Methane power-to-X market, by region, 2017 - 2030 (USD Million)

Table 8 Power-to-Methanol power-to-X market, by region, 2017 - 2030 (USD Million)

Table 9 Power-to-H2O2 power-to-X market, by region, 2017 - 2030 (USD Million)

Table 10 Global power-to-X market, by vertical, 2017 - 2030 (USD Million)

Table 11 Transportation power-to-X market, by region, 2017 - 2030 (USD Million)

Table 12 Agriculture power-to-X market, by region, 2017 - 2030 (USD Million)

Table 13 Manufacturing power-to-X market, by region, 2017 - 2030 (USD Million)

Table 14 Industry power-to-X market, by region, 2017 - 2030 (USD Million)

Table 15 Residential power-to-X market, by region, 2017 - 2030 (USD Million)

Table 16 Others power-to-X market, by region, 2017 - 2030 (USD Million)

Table 17 North America power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 18 North America power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 19 North America power-to-X market, by application, 2017 - 2030 (USD Million)

Table 20 North America power-to-X market, by power-to-X, 2017 - 2030 (USD Million)

Table 21 U.S. power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 22 U.S. power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 23 Canada power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 24 Canada power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 25 Europe power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 26 Europe power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 27 UK power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 28 UK power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 29 Germany power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 30 Germany power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 31 France power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 32 France power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 33 Asia Pacific power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 34 Asia Pacific power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 35 China power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 36 China power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 37 Japan power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 38 Japan power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 39 India power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 40 India power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 41 South Korea power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 42 South Korea power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 43 Australia power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 44 Australia power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 45 Latin America power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 46 Latin America power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 47 Brazil power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 48 Brazil power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 49 Mexico power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 50 Mexico power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 51 MEA power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 52 MEA power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 53 KSA power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 54 KSA power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 55 UAE power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 56 UAE power-to-X market, by end-use, 2017 - 2030 (USD Million)

Table 57 South Africa power-to-X market, by technology, 2017 - 2030 (USD Million)

Table 58 South Africa power-to-X market, by end-use, 2017 - 2030 (USD Million)

List Of Figures

LIST OF FIGURES

- Fig. 1 Power-to-X Market Segmentation
- Fig. 2 Information Procurement
- Fig. 3 Data Analysis Models
- Fig. 4 Market Formulation and Validation
- Fig. 5 Data Validating & Publishing
- Fig. 6 Market Snapshot
- Fig. 7 Segment Snapshot
- Fig. 8 Competitive Landscape Snapshot
- Fig. 9 Power-to-X market value, 2022 (USD Million)
- Fig. 10 Key opportunity analysis
- Fig. 11 Power-to-X - Industry Value Chain Analysis
- Fig. 12 Power-to-X Market Dynamics
- Fig. 13 Power-to-X Market: Porter's Analysis
- Fig. 14 Power-to-X Market: PESTEL Analysis
- Fig. 15 Power-to-X Market, by Technology: Key Takeaways
- Fig. 16 Power-to-X Market, by technology: Market Share, 2022 & 2030
- Fig. 17 Power-to-H2 market estimates & forecasts, 2017 - 2030 (Revenue USD Million)
- Fig. 18 Power-to-CO/syngas/formic acid market estimates & forecasts, 2017 - 2030 (Revenue USD Million)
- Fig. 19 Power-to-NH3 market estimates & forecasts, 2017 - 2030 (Revenue USD Million)
- Fig. 20 Power-to-Methane market estimates & forecasts, 2017 - 2030 (Revenue USD Million)
- Fig. 21 Power-to-Methanol market estimates & forecasts, 2017 - 2030 (Revenue USD Million)
- Fig. 22 Power-to-H2O2 market estimates & forecasts, 2017 - 2030 (Revenue USD Million)
- Fig. 23 Power-to-X market, by end-use: key takeaways
- Fig. 24 Power-to-X market, by end-use: market share, 2022 & 2030
- Fig. 25 Transportation market estimates & forecasts, 2017 - 2030 (Revenue USD Million)
- Fig. 26 Agriculture market estimates & forecasts, 2017 - 2030 (Revenue USD Million)
- Fig. 27 Manufacturing market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

Fig. 28 Industry market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

Fig. 29 Residential market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

Fig. 30 Others market estimates & forecasts, 2017 - 2030 (Revenue USD Million)

Fig. 31 Regional marketplace: key takeaways

Fig. 32 North America power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 33 U.S. power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 34 Canada power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 35 Europe power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 36 UK power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 37 Germany power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 38 France power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 39 Asia Pacific power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 40 China power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 41 Japan power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 42 India power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 43 South Korea power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 44 Australia power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 45 Latin America power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 46 Brazil power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 47 Mexico power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 48 Middle East & Africa power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 49 KSA power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 50 UAE power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 51 South Africa power-to-X market estimates & forecast, 2017 - 2030 (Revenue USD Million)

Fig. 52 Key Company Categorization

Fig. 53 Company Power-to-X Control & Connectivity Devices Market Share Analysis, 2022

Fig. 54 Company Power-to-X Security & Surveillance Equipment Market Share Analysis, 2022

Fig. 55 Company Power-to-X Appliances Market Share Analysis, 2022

Fig. 56 Strategic framework

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