

HVDC Transmission Market Forecasts to 2034 – Global Analysis By Component (Converter Stations, Transmission Cables, Converters & Valves, Transformers, Harmonic Filters, Reactors, Circuit Breakers & Switchgear, Surge Arresters, Control & Protection Systems, Electrodes & Electrode Systems, Reactive Power Compensation Systems, and Other Components), Voltage Rating, Power Rating, Transmission Type, Technology, Application, and By Geography

<https://marketpublishers.com/r/HD685E472D6FEN.html>

Date: September 2026

Pages: 200

Price: US\$ 4,150.00 (Single User License)

ID: HD685E472D6FEN

Abstracts

According to Statistics MRC, the Global HVDC Transmission Market is accounted for \$16.4 billion in 2026 and is expected to reach \$34.2 billion by 2034 growing at a CAGR of 9.6% during the forecast period. HVDC (High Voltage Direct Current) transmission systems are electrical power transmission technologies that use direct current to transfer electricity over long distances with lower transmission losses than conventional AC systems. These systems are widely deployed for interregional power transfer, offshore wind integration, cross-border electricity trading, and connecting renewable energy projects to grid networks. The market is segmented by transmission type into overhead, underground, subsea, and mixed transmission, and by technology into Line-Commutated Converter (LCC), Voltage Source Converter (VSC), Capacitor Commutated Converter (CCC), and Hybrid HVDC.

Market Dynamics:

Driver:

Growing renewable energy integration and grid modernization

The rapid expansion of renewable energy projects, especially offshore wind farms and remote solar plants, necessitates efficient long-distance transmission solutions that HVDC technology uniquely provides. Utilities and governments are adopting HVDC technology to improve transmission efficiency, support renewable energy integration, and enhance grid reliability. Grid interconnection initiatives across countries are accelerating global HVDC deployment as nations link regional and cross-border power grids to enhance energy security and facilitate renewable energy integration. The increasing number of HVDC projects globally, particularly across Europe, China, North America, and South America, reflects growing confidence in the technology's economic feasibility.

Restraint:

High initial investment costs and project complexity

High initial investment costs, particularly for short-distance transmission, remain a major restraint for the HVDC market. HVDC systems require expensive converter stations, transformers, control equipment, and auxiliary systems, making them more costly than traditional AC transmission for shorter distances. The complex lifecycles of HVDC projects can delay implementation and increase costs, slightly restraining overall market expansion. Additionally, the availability of substitute technologies such as distributed and off-grid power generation systems presents competitive challenges. These financial and implementation barriers may limit adoption, particularly in regions with constrained infrastructure budgets.

Opportunity:

Growing adoption of Voltage Source Converter (VSC) technology

The increasing adoption of Voltage Source Converter (VSC) technology is transforming the HVDC transmission systems market as utilities seek greater flexibility for renewable energy integration and cross-border transmission. VSC systems provide improved power control, efficient connections to weak grids, a smaller footprint, modular design, black start capability, and reactive power support, making them particularly suitable for integrating offshore wind farms, solar power plants, and distributed energy systems.

VSC-based HVDC systems also enable underground and subsea cable transmission, making them ideal for urban centers and environmentally sensitive zones. As countries expand renewable capacity and move toward decentralized power generation, demand for flexible transmission solutions continues growing.

Threat:**Competition from alternative transmission technologies**

Competition from alternative transmission technologies and distributed generation models poses significant threats to the HVDC market. Traditional AC transmission remains cost-effective for shorter distances and established grid networks. Distributed and off-grid power generation systems may reduce reliance on large-scale centralized transmission in some regions. The availability of substitute technologies and the complexity of HVDC project implementation may slow adoption in certain applications. This competition may limit market penetration, particularly in regions where conventional AC solutions remain economically viable.

Covid-19 Impact:

The COVID-19 pandemic temporarily affected the HVDC transmission system market due to reduced electricity demand and disruptions in manufacturing and supply chains. However, post-pandemic recovery has been strong, supported by increased government focus on infrastructure investment, grid resilience, and energy security. The pandemic reinforced the importance of investing in critical infrastructure to ensure energy security and support economic recovery. The shift away from fossil fuels toward renewable energy sources further strengthened the market outlook. Government authorities worldwide recognized the need for grid stability investments, driving HVDC deployment post-pandemic.

The Overhead Transmission segment is expected to be the largest during the forecast period

The Overhead Transmission segment is expected to account for the largest market share during the forecast period, driven by its cost-effectiveness and suitability for long-distance bulk power transmission. The segment benefits from lower installation costs compared to underground and subsea alternatives, established infrastructure, and extensive experience in deployment. As utilities continue investing in long-distance transmission to connect renewable energy sources to demand centers, overhead

transmission maintains the largest transmission type segment share throughout the forecast period.

The Voltage Source Converter (VSC) segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the Voltage Source Converter (VSC) segment is predicted to witness the highest growth rate, fueled by its superior flexibility, smaller footprint, modular design, and suitability for renewable energy integration. VSC technology allows independent control of active and reactive power, black-start capability, and seamless integration into multi-terminal DC networks. VSC-based systems enable underground and subsea cable transmission, making them ideal for urban centers and environmentally sensitive zones. Technological advancements in modular multilevel converters are further enhancing the scalability, reliability, and cost-effectiveness of VSC systems. As governments across Europe, Asia Pacific, and North America favor VSC for new grid modernization projects and cross-border interconnections, VSC delivers the fastest technology segment growth.

Region with largest share:

During the forecast period, the Asia-Pacific region is expected to hold the largest market share, supported by large-scale power infrastructure investments and renewable energy expansion. China, Japan, and India are the major contributors to the growth of the HVDC transmission system market due to the growing demand for power in these countries. With large-scale infrastructure investment and government support for renewable energy integration, Asia Pacific maintains its dominant market position throughout the forecast period.

Region with highest CAGR:

Over the forecast period, the Asia-Pacific region is anticipated to exhibit the highest CAGR, driven by continued grid infrastructure expansion, government initiatives promoting renewable energy, and increasing cross-border power interconnections. India plans significant investment in additional transmission systems, including HVDC, between 2022 and 2027. The rapid expansion of renewable energy projects, especially offshore wind farms and remote solar plants, necessitates efficient transmission solutions across the region. Government-backed interconnection initiatives are accelerating global HVDC deployment. As power demand grows and grid modernization accelerates across the region, Asia Pacific delivers the fastest HVDC transmission

market growth globally.

Key players in the market

Some of the key players in HVDC Transmission Market include Hitachi Energy Ltd., Siemens Energy AG, GE Vernova Inc., Mitsubishi Electric Corporation, Schneider Electric SE, NR Electric Co., Ltd., Toshiba Energy Systems & Solutions Corporation, Prysmian S.p.A., Nexans S.A., NKT A/S, Sumitomo Electric Industries, Ltd., LS Cable & System Ltd., TBEA Co., Ltd., Bharat Heavy Electricals Limited (BHEL), China XD Electric Co., Ltd., Kalpataru Projects International Limited, Elsewedy Electric S.A.E., and KEI Industries Limited.

Key Developments:

In August 2026, GE Vernova and LS Electric signed an agreement at CIGRE 2026 to form the “Grid X Technology” joint venture, combining GE Vernova’s VSC-HVDC technology with local execution to build South Korea’s West Coast Energy Highway project.

In July 2026, Hitachi Energy signed contracts with Dutch-German transmission system operator TenneT for the Nederwiek3 and LanWin5 offshore grid connections, delivering 4 GW of combined HVDC transmission capacity across the North Sea to the Netherlands and Germany.

In June 2026, Siemens Energy and Neptun Smulders Offshore Renewables secured a major contract to construct a next-generation 2 GW offshore HVDC converter platform for North Sea wind transmission.

In March 2026, Prysmian signed a contract worth over €2.3 billion (?2 billion) with SP Energy Networks and National Grid Electricity Transmission to manufacture and install approximately 400 miles of 525 kV subsea and land cables for Eastern Green Link 4 (EGL4).

Components Covered:

Converter Stations

Transmission Cables

Converters and Valves

Transformers

Harmonic Filters

Reactors

Circuit Breakers and Switchgear

Surge Arresters

Control and Protection Systems

Electrodes and Electrode Systems

Reactive Power Compensation Systems

Other Components

Voltage Ratings Covered:

Up to 350 kV

Above 350 kV to 640 kV

Above 640 kV to 800 kV

Above 800 kV

Power Ratings Covered:

Below 500 MW

501–1,000 MW

1,001–1,500 MW

1,501–2,000 MW

Above 2,000 MW

Transmission Types Covered:

Overhead Transmission

Underground Transmission

Subsea Transmission

Mixed Transmission

Technologies Covered:

Line-Commutated Converter (LCC)

Voltage Source Converter (VSC)

Capacitor Commutated Converter (CCC)

Hybrid HVDC

Applications Covered:

Bulk Power Transmission

Grid Interconnection

Urban Power Infeed

Offshore Wind Integration

Remote Renewable Energy Transmission

Cross-Border Power Exchange

Island and Remote Area Electrification

Other Applications

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)
Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East
Africa

South Africa

Egypt

Morocco

Rest of Africa

What our report offers:

Market share assessments for the regional and country-level segments

Strategic recommendations for the new entrants

Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034

Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)

Strategic recommendations in key business segments based on the market estimations

Competitive landscaping mapping the key common trends

Company profiling with detailed strategies, financials, and recent developments

Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

Contents

1 EXECUTIVE SUMMARY

- 1.1 Market Snapshot and Key Highlights
- 1.2 Growth Drivers, Challenges, and Opportunities
- 1.3 Competitive Landscape Overview
- 1.4 Strategic Insights and Recommendations

2 RESEARCH FRAMEWORK

- 2.1 Study Objectives and Scope
- 2.2 Stakeholder Analysis
- 2.3 Research Assumptions and Limitations
- 2.4 Research Methodology
 - 2.4.1 Data Collection (Primary and Secondary)
 - 2.4.2 Data Modeling and Estimation Techniques
 - 2.4.3 Data Validation and Triangulation
 - 2.4.4 Analytical and Forecasting Approach

3 MARKET DYNAMICS AND TREND ANALYSIS

- 3.1 Market Definition and Structure
- 3.2 Key Market Drivers
- 3.3 Market Restraints and Challenges
- 3.4 Growth Opportunities and Investment Hotspots
- 3.5 Industry Threats and Risk Assessment
- 3.6 Technology and Innovation Landscape
- 3.7 Emerging and High-Growth Markets
- 3.8 Regulatory and Policy Environment
- 3.9 Impact of COVID-19 and Recovery Outlook

4 COMPETITIVE AND STRATEGIC ASSESSMENT

- 4.1 Porter's Five Forces Analysis
 - 4.1.1 Supplier Bargaining Power
 - 4.1.2 Buyer Bargaining Power
 - 4.1.3 Threat of Substitutes
 - 4.1.4 Threat of New Entrants

- 4.1.5 Competitive Rivalry
- 4.2 Market Share Analysis of Key Players
- 4.3 Product Benchmarking and Performance Comparison

5 GLOBAL HVDC TRANSMISSION MARKET, BY COMPONENT

- 5.1 Converter Stations
- 5.2 Transmission Cables
- 5.3 Converters and Valves
- 5.4 Transformers
- 5.5 Harmonic Filters
- 5.6 Reactors
- 5.7 Circuit Breakers and Switchgear
- 5.8 Surge Arresters
- 5.9 Control and Protection Systems
- 5.10 Electrodes and Electrode Systems
- 5.11 Reactive Power Compensation Systems
- 5.12 Other Components

6 GLOBAL HVDC TRANSMISSION MARKET, BY VOLTAGE RATING

- 6.1 Up to 350 kV
- 6.2 Above 350 kV to 640 kV
- 6.3 Above 640 kV to 800 kV
- 6.4 Above 800 kV

7 GLOBAL HVDC TRANSMISSION MARKET, BY POWER RATING

- 7.1 Below 500 MW
- 7.2 501–1,000 MW
- 7.3 1,001–1,500 MW
- 7.4 1,501–2,000 MW
- 7.5 Above 2,000 MW

8 GLOBAL HVDC TRANSMISSION MARKET, BY TRANSMISSION TYPE

- 8.1 Overhead Transmission
- 8.2 Underground Transmission
- 8.3 Subsea Transmission

8.4 Mixed Transmission

9 GLOBAL HVDC TRANSMISSION MARKET, BY TECHNOLOGY

9.1 Line-Commutated Converter (LCC)

9.2 Voltage Source Converter (VSC)

9.3 Capacitor Commutated Converter (CCC)

9.4 Hybrid HVDC

10 GLOBAL HVDC TRANSMISSION MARKET, BY APPLICATION

10.1 Bulk Power Transmission

10.2 Grid Interconnection

10.3 Urban Power Infeed

10.4 Offshore Wind Integration

10.5 Remote Renewable Energy Transmission

10.6 Cross-Border Power Exchange

10.7 Island and Remote Area Electrification

10.8 Other Applications

11 GLOBAL HVDC TRANSMISSION MARKET, BY GEOGRAPHY

11.1 North America

11.1.1 United States

11.1.2 Canada

11.1.3 Mexico

11.2 Europe

11.2.1 United Kingdom

11.2.2 Germany

11.2.3 France

11.2.4 Italy

11.2.5 Spain

11.2.6 Netherlands

11.2.7 Belgium

11.2.8 Sweden

11.2.9 Switzerland

11.2.10 Poland

11.2.11 Rest of Europe

11.3 Asia Pacific

- 11.3.1 China
- 11.3.2 Japan
- 11.3.3 India
- 11.3.4 South Korea
- 11.3.5 Australia
- 11.3.6 Indonesia
- 11.3.7 Thailand
- 11.3.8 Malaysia
- 11.3.9 Singapore
- 11.3.10 Vietnam
- 11.3.11 Rest of Asia Pacific
- 11.4 South America
 - 11.4.1 Brazil
 - 11.4.2 Argentina
 - 11.4.3 Colombia
 - 11.4.4 Chile
 - 11.4.5 Peru
 - 11.4.6 Rest of South America
- 11.5 Rest of the World (RoW)
 - 11.5.1 Middle East
 - 11.5.1.1 Saudi Arabia
 - 11.5.1.2 United Arab Emirates
 - 11.5.1.3 Qatar
 - 11.5.1.4 Israel
 - 11.5.1.5 Rest of Middle East
 - 11.5.2 Africa
 - 11.5.2.1 South Africa
 - 11.5.2.2 Egypt
 - 11.5.2.3 Morocco
 - 11.5.2.4 Rest of Africa

12 STRATEGIC MARKET INTELLIGENCE

- 12.1 Industry Value Network and Supply Chain Assessment
- 12.2 White-Space and Opportunity Mapping
- 12.3 Product Evolution and Market Life Cycle Analysis
- 12.4 Channel, Distributor, and Go-to-Market Assessment

13 INDUSTRY DEVELOPMENTS AND STRATEGIC INITIATIVES

- 13.1 Mergers and Acquisitions
- 13.2 Partnerships, Alliances, and Joint Ventures
- 13.3 New Product Launches and Certifications
- 13.4 Capacity Expansion and Investments
- 13.5 Other Strategic Initiatives

14 COMPANY PROFILES

- 14.1 Hitachi Energy Ltd.
- 14.2 Siemens Energy AG
- 14.3 GE Vernova Inc.
- 14.4 Mitsubishi Electric Corporation
- 14.5 Schneider Electric SE
- 14.6 NR Electric Co., Ltd.
- 14.7 Toshiba Energy Systems & Solutions Corporation
- 14.8 Prysmian S.p.A.
- 14.9 Nexans S.A.
- 14.10 NKT A/S
- 14.11 Sumitomo Electric Industries, Ltd.
- 14.12 LS Cable & System Ltd.
- 14.13 TBEA Co., Ltd.
- 14.14 Bharat Heavy Electricals Limited (BHEL)
- 14.15 China XD Electric Co., Ltd.
- 14.16 Kalpataru Projects International Limited
- 14.17 Elsewedy Electric S.A.E.
- 14.18 KEI Industries Limited

List Of Tables

LIST OF TABLES

Table 1 Global HVDC Transmission Market Outlook, By Region (2023–2034) (\$MN)

Table 2 Global HVDC Transmission Market Outlook, By Component (2023–2034) (\$MN)

Table 3 Global HVDC Transmission Market Outlook, By Converter Stations (2023–2034) (\$MN)

Table 4 Global HVDC Transmission Market Outlook, By Transmission Cables (2023–2034) (\$MN)

Table 5 Global HVDC Transmission Market Outlook, By Converters and Valves (2023–2034) (\$MN)

Table 6 Global HVDC Transmission Market Outlook, By Transformers (2023–2034) (\$MN)

Table 7 Global HVDC Transmission Market Outlook, By Harmonic Filters (2023–2034) (\$MN)

Table 8 Global HVDC Transmission Market Outlook, By Reactors (2023–2034) (\$MN)

Table 9 Global HVDC Transmission Market Outlook, By Circuit Breakers and Switchgear (2023–2034) (\$MN)

Table 10 Global HVDC Transmission Market Outlook, By Surge Arresters (2023–2034) (\$MN)

Table 11 Global HVDC Transmission Market Outlook, By Control and Protection Systems (2023–2034) (\$MN)

Table 12 Global HVDC Transmission Market Outlook, By Electrodes and Electrode Systems (2023–2034) (\$MN)

Table 13 Global HVDC Transmission Market Outlook, By Reactive Power Compensation Systems (2023–2034) (\$MN)

Table 14 Global HVDC Transmission Market Outlook, By Other Components (2023–2034) (\$MN)

Table 15 Global HVDC Transmission Market Outlook, By Voltage Rating (2023–2034) (\$MN)

Table 16 Global HVDC Transmission Market Outlook, By Up to 350 kV (2023–2034) (\$MN)

Table 17 Global HVDC Transmission Market Outlook, By Above 350 kV to 640 kV (2023–2034) (\$MN)

Table 18 Global HVDC Transmission Market Outlook, By Above 640 kV to 800 kV (2023–2034) (\$MN)

Table 19 Global HVDC Transmission Market Outlook, By Above 800 kV (2023–2034)

(\$MN)

Table 20 Global HVDC Transmission Market Outlook, By Power Rating (2023–2034)

(\$MN)

Table 21 Global HVDC Transmission Market Outlook, By Below 500 MW (2023–2034)

(\$MN)

Table 22 Global HVDC Transmission Market Outlook, By 501–1,000 MW (2023–2034)

(\$MN)

Table 23 Global HVDC Transmission Market Outlook, By 1,001–1,500 MW (2023–2034)

(\$MN)

Table 24 Global HVDC Transmission Market Outlook, By 1,501–2,000 MW (2023–2034)

(\$MN)

Table 25 Global HVDC Transmission Market Outlook, By Above 2,000 MW

(2023–2034) (\$MN)

Table 26 Global HVDC Transmission Market Outlook, By Transmission Type

(2023–2034) (\$MN)

Table 27 Global HVDC Transmission Market Outlook, By Overhead Transmission

(2023–2034) (\$MN)

Table 28 Global HVDC Transmission Market Outlook, By Underground Transmission

(2023–2034) (\$MN)

Table 29 Global HVDC Transmission Market Outlook, By Subsea Transmission

(2023–2034) (\$MN)

Table 30 Global HVDC Transmission Market Outlook, By Mixed Transmission

(2023–2034) (\$MN)

Table 31 Global HVDC Transmission Market Outlook, By Technology (2023–2034)

(\$MN)

Table 32 Global HVDC Transmission Market Outlook, By Line-Commutated Converter

(LCC) (2023–2034) (\$MN)

Table 33 Global HVDC Transmission Market Outlook, By Voltage Source Converter

(VSC) (2023–2034) (\$MN)

Table 34 Global HVDC Transmission Market Outlook, By Capacitor Commutated

Converter (CCC) (2023–2034) (\$MN)

Table 35 Global HVDC Transmission Market Outlook, By Hybrid HVDC (2023–2034)

(\$MN)

Table 36 Global HVDC Transmission Market Outlook, By Application (2023–2034)

(\$MN)

Table 37 Global HVDC Transmission Market Outlook, By Bulk Power Transmission

(2023–2034) (\$MN)

Table 38 Global HVDC Transmission Market Outlook, By Grid Interconnection

(2023–2034) (\$MN)

Table 39 Global HVDC Transmission Market Outlook, By Urban Power Infeed
(2023–2034) (\$MN)

Table 40 Global HVDC Transmission Market Outlook, By Offshore Wind Integration
(2023–2034) (\$MN)

Table 41 Global HVDC Transmission Market Outlook, By Remote Renewable Energy
Transmission (2023–2034) (\$MN)

Table 42 Global HVDC Transmission Market Outlook, By Cross-Border Power
Exchange (2023–2034) (\$MN)

Table 43 Global HVDC Transmission Market Outlook, By Island and Remote Area
Electrification (2023–2034) (\$MN)

Table 44 Global HVDC Transmission Market Outlook, By Other Applications
(2023–2034) (\$MN)

Note: Tables for North America, Europe, APAC, South America, and Rest of the World
(RoW) Regions are also represented in the same manner as above.

I would like to order

Product name: HVDC Transmission Market Forecasts to 2034 – Global Analysis By Component (Converter Stations, Transmission Cables, Converters & Valves, Transformers, Harmonic Filters, Reactors, Circuit Breakers & Switchgear, Surge Arresters, Control & Protection Systems, Electrodes & Electrode Systems, Reactive Power Compensation Systems, and Other Components), Voltage Rating, Power Rating, Transmission Type, Technology, Application, and By Geography

Product link: <https://marketpublishers.com/r/HD685E472D6FEN.html>

Price: US\$ 4,150.00 (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 <https://marketpublishers.com/r/HD685E472D6FEN.html>