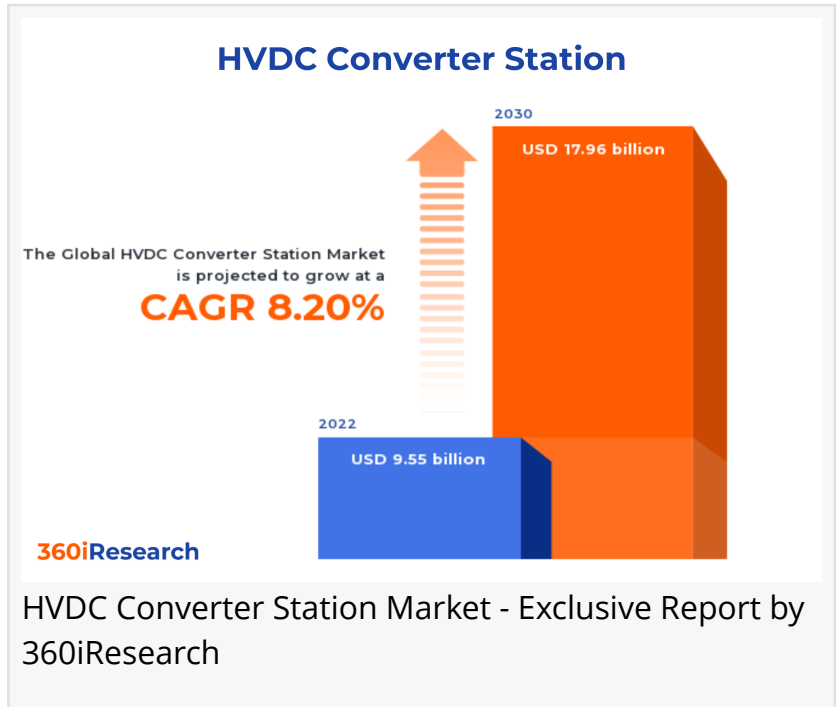


HVDC Converter Station Market worth \$17.96 billion by 2030 - Exclusive Report by 360iResearch

The Global HVDC Converter Station Market to grow from USD 9.55 billion in 2022 to USD 17.96 billion by 2030, at a CAGR of 8.20%.

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EINPresswire.com/ -- The "[HVDC Converter Station Market](#) by Technology (Line Commutated Converter, Voltage Source Converter), Component (Converter Station, Converter Transformers, Converter Unit), Configuration, Application - Global Forecast 2023-2030" report has been added to 360iResearch.com's offering.



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High voltage direct current (HVDC) converter station refers to a specialized facility that often forms the terminal component for an HVDC transmission line. It is designed for the efficient conversion of electrical power from one form to another, typically alternating current (AC) to direct current (DC) or vice versa. The primary application of HVDC converter stations is facilitating power transmission between regions, countries, and continents. The need for efficient long-distance energy transmission with minimal energy loss propels investment in HVDC converter station installations. Growing urbanization and government initiatives to propel the adoption of renewable energy sources have led to increased investments in power infrastructure development. The substantial initial investment required for HVDC converter

station installations may deter private entities from adopting this technology. Furthermore, the absence of standardized components and designs across various HVDC technologies may hinder interoperability between different systems. However, efforts by major providers of HVDC converter stations to harmonize HVDC design can propel standardization of the converter stations and increase the rate of adoption among end-users. R&D initiatives and funding to support continued advancements and innovations in converter technologies can expand the applications of the HVDC converter stations. Furthermore, offshore wind installations are gaining traction due to their large-scale generation potential, and HVDC technology is the most feasible solution for connecting these offshore installations to onshore grids.

Component: Ability of converter values to withstand high current losses during HVDC operation

Converter stations and converter units are essential components of HVDC systems responsible for converting high-voltage alternating current (AC) to direct current (DC) and vice versa. The converter transformers are a crucial component of HVDC systems that are designed to withstand DC voltage stresses and increased eddy current losses due to harmonic currents. Converter valves are designed to withstand current and voltage stresses during steady-state operation or during faults. Filters are critical components in HVDC systems to reduce harmonic distortion and ensure stable operation of the power grid. An HVDC system pole represents one of the two conductors in a bipolar configuration, carrying either positive or negative voltage. A reactive power source is essential in maintaining voltage stability and supporting AC grid operations in an HVDC converter station. Smoothing reactors are serially connected reactors installed in DC systems and are responsible for reducing harmonic currents, transient over-currents, and current ripples in DC systems.

Application: Higher efficiency of HVDC converter stations in long-distance interconnecting network transmission

HVDC converter stations play a crucial role in interconnecting networks, as they enable the efficient transfer of power between grids operating at different frequencies or voltages. These interconnected networks ensure the stability and reliability of the power supply by balancing load fluctuations and allowing access to diverse energy sources. The oil and gas sector requires reliable power systems for their remote offshore platforms to ensure smooth operations. HVDC converter stations cater to this demand by providing efficient power delivery through electrical subsea cables, minimizing environmental impacts related to traditional AC transmission systems. The power industry relies heavily on HVDC converter stations for transmitting electricity from power plants to long-distance consumers. In particular, renewable energy projects, such as wind and solar farms, benefit significantly from these systems due to the efficient integration of generated power into the grid.

Configuration: Adoption of multi-terminal systems to enable greater flexibility in connecting multiple power sources and grids

A back-to-back HVDC converter station consists of two converter units directly connected without any overhead lines or cables between them. This configuration is preferred when there is a need to synchronize adjacent AC grids with different frequencies or to control power flow

between independent grids without physical interconnection. Bipolar HVDC converter stations utilize two parallel circuits operating at the same voltage but opposite polarity (-/+). The primary advantage of this setup is its increased reliability; if one pole fails or undergoes maintenance, the other pole can continue transmitting up to half the rated capacity with reduced losses while maintaining ground potential reference. Monopolar HVDC converter stations consist of a single pole, either positive or negative, for power transmission, and a ground return path or metallic return conductor is used to complete the circuit. This configuration offers lower investment costs but may face issues with ground currents, environmental concerns, and lower reliability compared to bipolar systems. Multi-terminal HVDC converter stations comprise three or more terminals connected via an HVDC network. This configuration optimizes electricity transfer between multiple asynchronous grids and supports flexible power distribution from multiple sources, such as offshore wind farms or remote hydroelectric plants.

Technology: Growing adoption of voltage source converter (VSC) technology to power renewable energy projects

A line commutated converter (LCC) uses naturally commutated thyristor devices to convert AC power to DC power for transmission purposes. LCC technology has been the traditional choice for HVDC systems and is preferred in applications where there is a need for long-distance bulk power transfer, such as interconnecting large grids or remote power generation sources. Voltage source converter (VSC) technology is an advanced form of HVDC converter that uses self-commutated semiconductor devices such as insulated-gate bipolar transistors (IGBTs) for conversion. VSC technology offers the ability to operate in weak or isolated grids, reduce harmonic emissions, and lower reactive power consumption.

Regional Insights:

The Americas region has been an early adopter of HVDC converter station technology for long-distance power transmission from remote generation sites to major load centers. There has been a rising interest in integrating renewable energy sources such as wind and solar into existing grids using HVDC links. Key industry players in this region are involved in building new converter stations or upgrading existing infrastructure to accommodate higher capacities and improve efficiency. The rapidly expanding economies of Asia have led to an increased demand for reliable power supply systems. As a result, several large-scale HVDC projects have been commissioned or are under development across countries, including China, India, Japan, and South Korea. Asia is projected to continue being the fastest-growing market for HVDC converter stations due to their ongoing efforts to increase renewable energy integration and the presence of an economies-of-scale business environment for companies to expand their production in the region. Europe has a long history of utilizing HVDC technology for cross-border power exchanges between its member countries. The European Union's focus on reducing carbon emissions and increasing energy efficiency has further promoted the adoption of HVDC converter stations to facilitate the integration of offshore wind farms and solar parks into national grids. Key European players in this domain have been making large-scale investments in renewable energy projects, expanding the demand for HVDC converter stations.

FPNV Positioning Matrix:

The FPNV Positioning Matrix is essential for assessing the HVDC Converter Station Market. It provides a comprehensive evaluation of vendors by examining key metrics within Business Strategy and Product Satisfaction, allowing users to make informed decisions based on their specific needs. This advanced analysis then organizes these vendors into four distinct quadrants, which represent varying levels of success: Forefront (F), Pathfinder (P), Niche (N), or Vital(V).

Market Share Analysis:

The Market Share Analysis offers an insightful look at the current state of vendors in the HVDC Converter Station Market. By comparing vendor contributions to overall revenue, customer base, and other key metrics, we can give companies a greater understanding of their performance and what they are up against when competing for market share. The analysis also sheds light on just how competitive any given sector is about accumulation, fragmentation dominance, and amalgamation traits over the base year period studied.

Key Company Profiles:

The report delves into recent significant developments in the HVDC Converter Station Market, highlighting leading vendors and their innovative profiles. These include ABB Ltd., Aker Solutions, American Superconductor Corporation, Bharat Heavy Electricals Limited, C-EPRI Electric Power Engineering Co., Ltd., Crompton Greaves Ltd, Eaton Corporation PLC, General Electric Company, Hitachi Energy Limited, Hyosung Corporation, Itron, Inc., LS Electric Co., Ltd., M. A. Mortenson Company, Mitsubishi Electric Corporation, Nexans SA, NKT A/S, NR Electric Co., Ltd., Prysmian Group, Rongxin Power Ltd., Siemens AG, Sumitomo Electric Industries, Ltd., Texas Instruments Incorporated, Toshiba Corporation, TransGrid Solutions Inc., and XJ Group Corporation.

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Market Segmentation & Coverage:

This research report categorizes the HVDC Converter Station Market in order to forecast the revenues and analyze trends in each of following sub-markets:

Based on Technology, market is studied across Line Commutated Converter and Voltage Source Converter. The Line Commutated Converter is projected to witness significant market share during forecast period.

Based on Component, market is studied across Converter Station, Converter Transformers, Converter Unit, Converter Valves, Filters, HVDC System Pole, Reactive Power Source, and Smoothing Reactor. The Converter Transformers is projected to witness significant market share

during forecast period.

Based on Configuration, market is studied across Back-To-Back, Bipolar, Monopolar, and Multi-Terminal. The Bipolar is projected to witness significant market share during forecast period.

Based on Application, market is studied across Interconnecting Networks, Oil & Gas, and Power Industry. The Interconnecting Networks is projected to witness significant market share during forecast period.

Based on Region, market is studied across Americas, Asia-Pacific, and Europe, Middle East & Africa. The Americas is further studied across Argentina, Brazil, Canada, Mexico, and United States. The United States is further studied across California, Florida, Illinois, New York, Ohio, Pennsylvania, and Texas. The Asia-Pacific is further studied across Australia, China, India, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand, and Vietnam. The Europe, Middle East & Africa is further studied across Denmark, Egypt, Finland, France, Germany, Israel, Italy, Netherlands, Nigeria, Norway, Poland, Qatar, Russia, Saudi Arabia, South Africa, Spain, Sweden, Switzerland, Turkey, United Arab Emirates, and United Kingdom. The Europe, Middle East & Africa commanded largest market share of 38.26% in 2022, followed by Americas.

Key Topics Covered:

1. Preface
2. Research Methodology
3. Executive Summary
4. Market Overview
5. Market Insights
6. HVDC Converter Station Market, by Technology
7. HVDC Converter Station Market, by Component
8. HVDC Converter Station Market, by Configuration
9. HVDC Converter Station Market, by Application
10. Americas HVDC Converter Station Market
11. Asia-Pacific HVDC Converter Station Market
12. Europe, Middle East & Africa HVDC Converter Station Market
13. Competitive Landscape
14. Competitive Portfolio
15. Appendix

The report provides insights on the following pointers:

1. Market Penetration: Provides comprehensive information on the market offered by the key players
2. Market Development: Provides in-depth information about lucrative emerging markets and analyzes penetration across mature segments of the markets

3. Market Diversification: Provides detailed information about new product launches, untapped geographies, recent developments, and investments
4. Competitive Assessment & Intelligence: Provides an exhaustive assessment of market shares, strategies, products, certification, regulatory approvals, patent landscape, and manufacturing capabilities of the leading players
5. Product Development & Innovation: Provides intelligent insights on future technologies, R&D activities, and breakthrough product developments

The report answers questions such as:

1. What is the market size and forecast of the HVDC Converter Station Market?
2. Which are the products/segments/applications/areas to invest in over the forecast period in the HVDC Converter Station Market?
3. What is the competitive strategic window for opportunities in the HVDC Converter Station Market?
4. What are the technology trends and regulatory frameworks in the HVDC Converter Station Market?
5. What is the market share of the leading vendors in the HVDC Converter Station Market?
6. What modes and strategic moves are considered suitable for entering the HVDC Converter Station Market?

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