

# **HVDC Converter Station Market by Component (Converter, DC Equipment, Converter Transformer, and Others), Technology (Voltage Source Converter (VSC), Line Commutated Converter (LCC)), Type (Bi-Polar, Monopolar, Back-to-back, Multi Terminal), Application (Power Industry, Oil and Gas, Powering Island and Remote Loads, Interconnecting Networks, and Others), and Region 2023-2028**

<https://marketpublishers.com/r/HC787B38D276EN.html>

Date: July 2023

Pages: 144

Price: US\$ 2,499.00 (Single User License)

ID: HC787B38D276EN

## **Abstracts**

### Market Overview:

The global HVDC converter station market size reached US\$ 11.26 Billion in 2022. Looking forward, IMARC Group expects the market to reach US\$ 17.19 Billion by 2028, exhibiting a growth rate (CAGR) of 7.50% during 2023-2028. The widespread adoption of renewable energy and HVDC converter stations for interconnecting power grids across different regions or countries, and the numerous government initiatives promoting renewable energy deployment represent some of the key factors driving the market.

An HVDC converter station, short for a high-voltage direct current converter station, is crucial in high-voltage direct current (HVDC) transmission systems. It functions as a bridge between various power systems, enabling the stable and effective transfer of electricity across great distances. Its primary duty is to change electricity from alternating current (AC) to direct current (DC) or vice versa, depending on the direction the power is flowing. The converter station consists of various key elements that work in harmony to facilitate the conversion process. One of the main components is the

converter transformer, which is responsible for stepping up or down the AC power's voltage level. These transformers are typically designed to handle extremely high voltages, ranging from a few hundred kilovolts to several hundreds of kilovolts, depending on the specific HVDC transmission system. Additionally, it also incorporates smoothing reactors, which are used to smooth out any fluctuations in the DC power, reducing ripple effects and improving overall power quality. Moreover, the station includes filters and harmonic traps to mitigate harmonics and other electrical disturbances that may arise during the conversion process.

#### HVDC Converter Station Market Trends:

The growing trend of renewable energy majorly drives the global market. Coupled with the augmenting need for efficient transmission of power from remote renewable energy generation sites to population centers, this is significantly supporting the market. Along with this, the widespread adoption of HVDC converter stations for interconnecting power grids across different regions or countries is propelling the market as they enable the transfer of electricity between asynchronous AC grids, facilitating the exchange of power, improving grid stability, and enhancing overall energy security. In addition, the increasing inclination toward HVDC systems over AC transmission as they offer lower transmission losses, reduced voltage drops, and increased power transfer capacity over longer distances is positively influencing the market. As the demand for long-distance power transmission increases, the demand for HVDC converter stations grows, thereby creating a positive market outlook. Apart from this, government initiatives promoting renewable energy deployment, grid interconnections, and energy market liberalization are contributing to the market. Furthermore, the development of advanced power electronic devices, improved converter station designs, and enhanced control and protection systems are creating a positive market outlook. Some of the other factors driving the market include rapid industrialization and the increasing number of offshore wind farms.

#### Key Market Segmentation:

IMARC Group provides an analysis of the key trends in each segment of the global HVDC converter station market, along with forecasts at the global, regional, and country levels from 2023-2028. Our report has categorized the market based on component, technology, type, and application.

#### Component Insights:

Converter  
DC Equipment

## Converter Transformer Others

The report has provided a detailed breakup and analysis of the HVDC converter station market based on the component. This includes converter, DC equipment, converter transformer, and others. According to the report, the DC equipment represented the largest segment.

### Technology Insights:

#### Voltage Source Converter (VSC) Line Commutated Converter (LCC)

A detailed breakup and analysis of the HVDC converter station market based on the technology has also been provided in the report. This includes voltage source converter (VSC) and line commutated converter (LCC). According to the report, line commutated converter (LCC) accounted for the largest market share.

### Type Insights:

#### Bi-Polar Monopolar Back-to-back Multi Terminal

The report has provided a detailed breakup and analysis of the HVDC converter station market based on the type. This includes bi-polar, monopolar, back-to-back, and multi terminal. According to the report, the bi-polar represented the largest segment.

### Application Insights:

#### Power Industry Oil and Gas Powering Island and Remote Loads Interconnecting Networks Others

A detailed breakup and analysis of the HVDC converter station market based on the application has also been provided in the report. This includes power industry, oil and

gas, powering island and remote loads, interconnecting networks, and others. According to the report, powering island and remote loads accounted for the largest market share.

#### Regional Insights:

North America

United States

Canada

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Others

Europe

Germany

France

United Kingdom

Italy

Spain

Russia

Others

Latin America

Brazil

Mexico

Others

Middle East and Africa

The report has also provided a comprehensive analysis of all the major regional markets, which include North America (the United States and Canada); Asia Pacific (China, Japan, India, South Korea, Australia, Indonesia, and others); Europe (Germany, France, the United Kingdom, Italy, Spain, Russia and others); Latin America (Brazil, Mexico, and others); and the Middle East and Africa. According to the report, Europe was the largest market for HVDC converter station. Some of the factors driving the Europe HVDC converter station market included the emerging trend of renewable energy, continual technological advancements, rapid industrialization, etc.

### Competitive Landscape:

The report has also provided a comprehensive analysis of the competitive landscape in the global HVDC converter station market. Also, detailed profiles of all major companies have been provided. Some of the companies covered include GE Grid Solutions LLC (General Electric Company), Hitachi Energy Ltd. (Hitachi Ltd.), Hyosung Heavy Industries, Mitsubishi Electric Corporation, NR Electric Co. Ltd. (NARI Technology Co. Ltd.), Siemens Energy AG, etc. Kindly note that this only represents a partial list of companies, and the complete list has been provided in the report.

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- Converter
- DC Equipment
- Converter Transformer
- Others

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- Bi-Polar
- Monopolar
- Back-to-back
- Multi Terminal

The report has provided a detailed breakup and analysis of the HVDC converter station market based on the type. This includes bi-polar, monopolar, back-to-back, and multi terminal. According to the report, the bi-polar represented the largest segment.

#### Application Insights:

- Power Industry
- Oil and Gas
- Powering Island and Remote Loads
- Interconnecting Networks
- Others

A detailed breakup and analysis of the HVDC converter station market based on the application has also been provided in the report. This includes power industry, oil and gas, powering island and remote loads, interconnecting networks, and others. According to the report, powering island and remote loads accounted for the largest market share.

#### Regional Insights:

- North America
  - United States
  - Canada
- Asia Pacific
  - China
  - Japan
  - India



South Korea  
Australia  
Indonesia  
Others  
Europe  
Germany  
France  
United Kingdom  
Italy  
Spain  
Russia  
Others  
Latin America  
Brazil  
Mexico  
Others  
Middle East and Africa

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#### Key Questions Answered in This Report:

How has the global HVDC converter station market performed so far, and how will it perform in the coming years?



What are the drivers, restraints, and opportunities in the global HVDC converter station market?

What is the impact of each driver, restraint, and opportunity on the global HVDC converter station market?

What are the key regional markets?

Which countries represent the most attractive HVDC converter station market?

What is the breakup of the market based on the component?

Which is the most attractive component in the HVDC converter station market?

What is the breakup of the market based on the technology?

Which is the most attractive technology in the HVDC converter station market?

What is the breakup of the market based on the type?

Which is the most attractive type in the HVDC converter station market?

What is the breakup of the market based on the application?

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