

# **HVDC Capacitor Market by Product Type (Ceramic Capacitors, Plastic Film Capacitors), Technology, Installation Type (Open Rack Capacitor Banks, Enclosed Rack Capacitor Banks), Application (Industrial, Commercial) and Region - Global Forecast to 2031**

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## **Abstracts**

The global HVDC capacitor market was valued at USD 6.4 billion in 2023 to USD 17.9 billion by 2031; it is expected to grow at a CAGR of 13.8% from 2023 to 2031. The growth of HVDC projects for long-distance electricity transmission, renewable energy integration, and power grid interconnection can greatly drive the HVDC capacitor market. Moreover, HVDC systems are increasingly used with energy storage options to control peak demand, store excess energy, and provide grid stabilization services.

Key players operating in the HVDC Capacitor Market are Hitachi, Ltd. (Japan), General Electric (US), TDK Corporation (Japan), Eaton (US), KYOCERA Corporation (Japan), YAGEO Corporation (Taiwan), Vishay Intertechnology, Inc. (US). The energy and power application segment in the High-Voltage Direct Current (HVDC) capacitor market is driven by many important aspects such as Renewable Energy Integration, Long-Distance Transmission, Grid Interconnections, Grid Stabilization and Power Quality, and Energy Storage Integration.

The ceramic capacitor product type is projected to grow at the highest CAGR during the forecast period.

HVDC ceramic capacitors are projected to grow at the highest CAGR during the forecast period owing to the increased adoption of these capacitors in the automotive,

transportation, consumer electronics, healthcare, energy and power, and telecommunications industries. Ceramic capacitors are well-known for their exceptional stability and low loss levels. They are not polarized and can be connected to both AC and DC power sources. They can also be downsized and produced in mass quantities. They can also tolerate voltage fluctuations. As a result, they are used in resonant circuits in transmission stations, bypass filters, coupling or decoupling, and oscillators.

The Voltage-Source Converter (VSC) technology is projected to grow at the highest CAGR during the forecast period.

The Voltage-Source Converter (VSC) technology will likely grow at the highest CAGR during the forecast period. VSC is a newer technology based on power transistors. In this technology, the reactive power compensation system is not required to supply reactive power to the grid. It operates at very low or almost zero power for transmitting reactive power. It reduces commutation risk failure due to low voltage requirements. Moreover, it is an ideal technology for submarine/land cable interconnection, integrating renewables, offshore, and urban infeed applications.

Asia Pacific region is likely to grow at the highest CAGR.

The Asia Pacific region has undergone remarkable economic advancement, urban development, and a surge in energy requirements. These elements, along with others, play a significant role in propelling the growth of the HVDC capacitor market in this area. When considering Asia Pacific, the emphasis is primarily on countries like China, Japan, India, and the rest of the region. China and India particularly stand out as major players in the HVDC capacitor market within this region. Due to their dense populations and the need to satisfy escalating energy needs, these nations are substantial electricity producers. Both countries are actively prioritizing the expansion of their energy generation infrastructure.

#### Breakdown of primaries

The study contains insights from various industry experts, ranging from component suppliers to Tier 1 companies and OEMs. The break-up of the primaries is as follows:

By Company Type - Tier 1 – 50%, Tier 2 – 30%, Tier 3 – 20%

By Designation— C-level Executives - 45%, Directors - 35%, Others – 20%

By Region—North America - 20%, Europe - 40%, Asia Pacific - 30%, RoW - 10%

The HVDC Capacitor Market is dominated by a few globally established players such as Hitachi, Ltd. (Japan), General Electric (US), TDK Corporation (Japan), Eaton (US), KYOCERA Corporation (Japan), YAGEO Corporation (Taiwan), Vishay Intertechnology, Inc. (US), General Atomics (US), LIFASA, International Capacitors, S.A. (Spain), and ELECTRONICON Kondensatoren GmbH (Germany). The study includes an in-depth competitive analysis of these key players in the HVDC capacitor market, with their company profiles, recent developments, and key market strategies.

#### Research Coverage:

The report segments the HVDC Capacitor Market and forecasts its size by product type, technology, installation type, application, and region. The report also discusses the drivers, restraints, opportunities, and challenges pertaining to the market. It gives a detailed view of the market across four main regions— North America, Europe, Asia Pacific, and RoW. Supply chain analysis has been included in the report, along with the key players and their competitive analysis in the HVDC Capacitor ecosystem.

#### Key Benefits to Buy the Report:

Analysis of Key Drivers (Rising demand for HVDC transmission systems, Increasing adoption of renewable energy sources with rising energy consumption, Ongoing government initiatives to improve energy infrastructure).  
Restraints (Hazardous effects of HV capacitors on humans and environment).  
Opportunities (Rising adoption of HVDC capacitors by industrial consumers in Asia Pacific, Escalating demand for electric vehicles) and Challenges (Catastrophic explosion of capacitor banks).

Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and new product launches in the HVDC Capacitor Market.

Market Development: Comprehensive information about lucrative markets – the report analyses the HVDC Capacitor Market across varied regions

Market Diversification: Exhaustive information about new products & services, untapped geographies, recent developments, and investments in the HVDC

Capacitor Market.

Competitive Assessment: In-depth assessment of market shares, growth strategies, and product offerings of leading players like Hitachi, Ltd. (Japan), General Electric (US), TDK Corporation (Japan), Eaton (US), KYOCERA Corporation (Japan), YAGEO Corporation (Taiwan), Vishay Intertechnology, Inc. (US) among others in the HVDC capacitor market.

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Recent Developments might not be captured in case of unlisted companies.

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## About

The total HVDC capacitor market is expected to reach \$XX million by 2020, at an estimated CAGR of XX% from 2014 to 2020. This report covers the key applications of the HVDC capacitor market, including the commercial sector, industrial sector, energy and power, defense, and others. Among all the applications, the energy and power sector is expected to be the largest contributor to the overall HVDC capacitor market, holding a ~XX% share of the market. It is expected to reach \$XX million by 2020 at a CAGR of XX% from 2014. The industrial application was valued at \$XX million in 2013 and is expected to reach \$XX million by 2020. On the other hand, smaller application sectors, such as defense and others (medical, electronics, and so on) accounted for about XX% of the high voltage capacitors market in 2013.

In the HVDC capacitor market by technology, the Line Commutated Converter (LCC) technology held the major share worth XX% (\$XX million) in 2013. LCC is a proven technology for asynchronous connection and bulk power transmission over long distances. However, there is a need for interconnections among the neighbouring power grids for reliable transmission of power. This need arises to prevent power failure and share power loads with existing grids, which have increased in the recent years. Thus, market opportunities for the VSC technology, which is more compact and enables renewable energy, is expected to increase over the next few years.

The majority of capacitors used for high voltage applications are plastic film capacitors. Plastic film capacitors, aluminum electrolytic capacitors, and ceramic capacitors have been identified as large markets in the high voltage capacitors and are expected to witness a significant growth over the next few years. The market for plastic film capacitors was valued at \$XX million in 2013 and is expected to reach \$XX million by 2020 at a CAGR of XX%. On the other hand, the markets for aluminum electrolytic capacitors and ceramic capacitors were valued at \$XX million and \$XX million respectively, in 2013. The overall HVDC capacitors are expected to continue to occupy a significant share of the global capacitor industry and will be a high growth market over the coming years.

Over the last two decades, HVDC has become a dominating technology for bulk power transmission over long distances. By 1970s, countries which adopted high voltage AC transmission had switched to HVDC transmission due to benefits such as reduced electric losses and increased reliability of the transmission system.

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