

HVDC Cables Market Size Will Anticipated to Surpass US\$ 4.6 Bn, Expanding at a CAGR of 6.3% by 2035 | TMR Research

Exploring the critical role of HVDC cables in long-distance power transmission and the integration of renewable energy into the global grid infrastructure.

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-- The global [HVDC cables market](#) is a critical component of modern power transmission infrastructure, valued at US\$ 2.4 Bn in 2024. These specialized cables are essential for long-distance, high-capacity power transfer, and their demand is growing rapidly due to the increasing focus on renewable energy and the need for efficient grid interconnections. The market is projected for significant expansion over the next decade, with a forecast to grow at a Compound Annual Growth Rate (CAGR) of 6.3% from 2025 to 2035. This robust growth is expected to drive the market value to a notable US\$ 4.6 Bn by the end of 2035.

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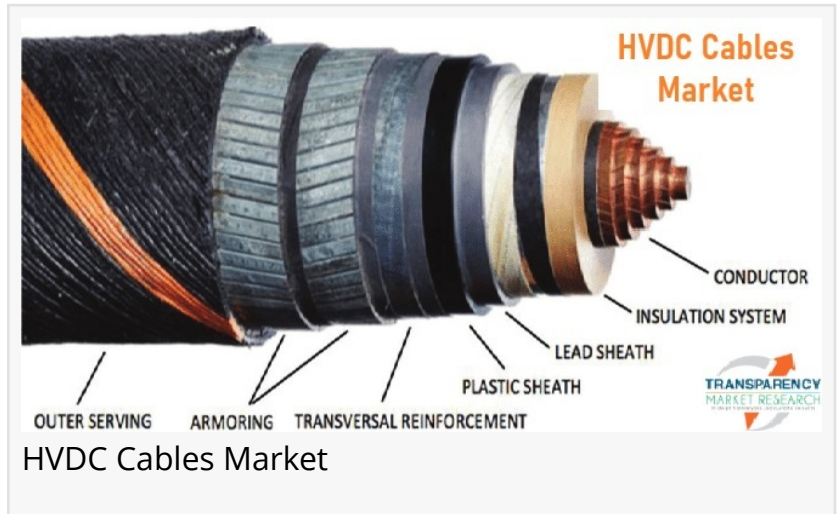
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This expansion is fueled by the global energy transition towards cleaner sources, a surge in offshore wind farm projects, and the development of supergrids. This report provides a detailed overview of the key factors driving this market, its various applications, and the regional dynamics shaping its trajectory.

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Key Market Drivers and Underlying Factors

The robust growth of the HVDC cables market is driven by several key factors that are fundamentally reshaping the global energy landscape. The most significant driver is the global push for renewable energy integration. As nations invest heavily in large-scale renewable projects, such as offshore wind farms, vast solar parks, and hydroelectric plants, the need to transport electricity efficiently over long distances becomes paramount. These energy sources are often located far from major consumption centers, making HVDC technology, which experiences lower transmission losses compared to traditional AC systems, the ideal solution. The expansion of offshore wind, in particular, is a major catalyst, as HVDC submarine cables are the preferred method for connecting these distant farms to the mainland grid.

Another critical factor is the increasing need for grid interconnection and modernization. Many national grids are aging and were not originally designed to handle the decentralized and intermittent nature of renewable power. HVDC cables enable the creation of interconnected "supergrids," which can balance supply and demand across vast geographical areas. This enhances grid stability, improves energy security, and allows for the seamless flow of power between regions with different time zones and energy generation profiles. This trend is especially prominent in Europe and Asia-Pacific, where cross-border energy projects are gaining traction.

Furthermore, the growth of industrial and urban development is driving demand. As cities and industrial hubs expand, the need for reliable and high-capacity power supply becomes critical. HVDC cables can be installed underground, which is a significant advantage in densely populated areas where land for traditional overhead lines is scarce. This makes them a viable option for powering large data centers, industrial complexes, and major cities without disrupting the urban landscape.

Market Segmentation by Product Type

The HVDC cables market can be segmented based on the type of insulation used, which significantly impacts their performance and application.

Mass-Impregnated (MI) Cables: These cables use paper insulation impregnated with a viscous compound. While they are a mature and reliable technology, their use is becoming less common due to the advent of newer technologies. They are typically used for submarine and underground applications.

Oil-Filled Cables: These cables use oil as a fluid impregnant and a cooling medium. They offer high dielectric strength but require continuous monitoring and maintenance due to the presence of oil. This has led to a decline in their use, particularly in new projects, in favor of more environmentally friendly options.

Extruded Cables (XLPE): Cross-Linked Polyethylene (XLPE) cables represent the most dynamic

and fastest-growing segment of the market. They are highly favored for their superior thermal, electrical, and mechanical properties. Unlike older technologies, XLPE cables are solid-state, making them easier to install and maintain. They are non-toxic, have a longer lifespan, and are well-suited for both underground and submarine applications. The ongoing technological advancements in XLPE manufacturing are pushing its voltage rating higher, making it a direct competitor to traditional technologies in a wider range of projects.

Market Segmentation by Application and Installation

The application of HVDC cables is largely dictated by the installation environment, which includes underground, submarine, and overhead lines.

Submarine HVDC Cables: This segment holds the largest market share due to the proliferation of offshore renewable energy projects. These cables are designed to withstand the harsh marine environment and are crucial for connecting offshore wind farms, tidal energy plants, and grid interconnections between islands or across continents. The long-distance and high-power transfer capabilities of HVDC are perfectly suited for these applications, where AC cables would be inefficient and costly due to high charging currents.

Underground HVDC Cables: This segment is vital for urban and environmentally sensitive areas. Underground cables avoid the visual impact and land requirements of overhead lines, making them ideal for grid expansion in cities and protected landscapes. They are also less susceptible to environmental damage from storms, lightning, or other natural disasters, ensuring a more reliable power supply.

Overhead HVDC Cables: While less common than underground and submarine installations in new projects, overhead lines remain a viable and cost-effective solution for long-distance power transmission in rural or sparsely populated areas. They are easier to repair and maintain compared to buried cables but can face public opposition due to their visual footprint.

Regional Market Dynamics

The global HVDC cables market exhibits significant regional variation, driven by differing energy policies, investment priorities, and geographical characteristics.

Asia-Pacific: This region is the undisputed leader in the HVDC cables market and is expected to maintain its dominance. The rapid industrialization, urbanization, and ambitious renewable energy targets in countries like China and India are the primary drivers. China has a vast network of HVDC projects aimed at transporting electricity from hydro and wind power plants in the west to the industrial eastern seaboard. India is also investing heavily in modernizing its grid and integrating solar energy, which will further propel market growth.

Europe: Europe is a mature but highly innovative market. The region's strong focus on renewable

energy and its commitment to creating a unified European energy grid have driven significant investment in cross-border and offshore HVDC cable projects. Countries like Germany, the UK, and Denmark are pioneers in offshore wind, relying heavily on submarine HVDC cables. Strict environmental regulations and the push for grid stability also ensure continuous investment in this technology.

North America: The North American market is driven by the need to modernize aging power infrastructure and integrate a growing share of renewable energy, particularly from wind farms in the central United States and Canada. Projects aimed at improving grid reliability and efficiency are key. While the market is mature, a renewed focus on infrastructure spending and the push towards a cleaner energy mix are expected to drive steady growth.

Middle East & Africa: This is an emerging market with substantial potential. The region is investing in large-scale solar power projects and is exploring interconnections to improve energy security. Countries like the UAE and Saudi Arabia are diversifying their economies and moving towards sustainable energy, which will create new opportunities for HVDC cable projects.

Competitive Landscape and Future Outlook

The global HVDC cables market is highly competitive, dominated by a few major players with deep technological expertise. Key market participants include Prysmian Group, Nexans S.A., NKT A/S, and Sumitomo Electric Industries, Ltd. These companies are focused on strategic initiatives such as developing higher-voltage cables, expanding manufacturing capabilities, and securing large-scale project contracts.

Prysmian Group

Nexans S.A.

Sumitomo Electric Industries, Ltd.

NKT A/S

ZTT Group

LS Cable & System

Shanghai QiFan Cable Co., Ltd.

General Electric Company

Furukawa Electric Co., Ltd.

FAR EAST Cable Co., Ltd.

Others

Looking ahead, the future of the HVDC cables market is exceptionally promising. The continued global energy transition is a powerful and irreversible trend. As renewable energy projects grow in scale and move to more remote locations, the demand for efficient long-distance power transmission will only increase. Technological innovations, such as the development of more sustainable and higher-performance insulation materials and the use of smart monitoring systems, will further enhance the appeal of HVDC technology. The development of transnational

supergrids and the electrification of various sectors will cement the role of HVDC cables as the backbone of the future energy system.

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Contact:

Transparency Market Research Inc.

CORPORATE HEADQUARTER DOWNTOWN,

1000 N. West Street,

Suite 1200, Wilmington, Delaware 19801 USA

Tel: +1-518-618-1030

USA – Canada Toll Free: 866-552-3453

Website: <https://www.transparencymarketresearch.com>

Email: sales@transparencymarketresearch.com

Atil Chaudhari

Transparency Market Research Inc.

+ +1 518-618-1030

[email us here](#)

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