Overhead Transmission Market Assessment, By Voltage Range [Low, Medium, High, Extra-High], By Application [Electricity Transmission, Renewable Energy Integration, Smart Grid Infrastructure], By End-user [Telecommunication, Transportation, Industrial and Commercial, Utilities, Others], By Region, Opportunities and Forecast, 2018-2032F

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Report description:

Global Overhead Transmission market is projected to witness a CAGR of 3.78% during the forecast period 2025-2032, growing from USD 35.07 billion in 2024 to USD 47.18 billion in 2032. The market has experienced significant growth in recent years and is expected to maintain a strong pace of expansion in the coming years.
Overhead transmission lines are essential for the proper transfer of electricity over long distances. The lines enable the integration of renewable energy sources into the grid, thereby paving the way for an expansion of sustainable power generation globally. Additionally, the overhead lines are relatively inexpensive and easier to maintain, driving market demand. All of the aforementioned factors have led to overhead lines being a crucial part of planning a modern energy system.
Asia-Pacific is regarded as one of the prominent regions in the market, especially due to the presence of countries like China and India. These countries are encouraging the development of power transmission by launching new high-voltage direct current (HVDC) overhead transmission projects. These projects will not only enhance the efficient transfer of electrical energy over long distances but will also play a significant role in promoting a clean and sustainable energy future in the years to come.
For example, in July 2024, China's State Grid Corporation revealed its first □800 kilovolt (kV) ultra-high voltage flexible direct current (UHVDC) overhead transmission project. The overhead transmission line will carry more than 36 billion kWh of electricity yearly between Gansu and Zhejiang province, of which 50% of the electrical power will be derived from renewable energy sources. The project spans over 2,370 kilometers and is worth approximately USD 4.82 billion. It will go through six provinces (Gansu, Shaanxi, the Ningxia Hui autonomous region, Anhui, Zhejiang provinces, and Henan), minimizing transmission losses

while developing clean energy in the regions.

Rise in Need for Rural Electrification is Fueling Market Expansion

Rural electrification requires overhead transmission lines to connect remote regions with the national electricity grid. In rural areas, overhead lines are mostly preferred as these lines are cost-effective means for high-voltage transmission. Moreover, rapid technological advancements make overhead transmission infrastructure more reliable, thereby contributing to a more sustainable environment. Furthermore, governments worldwide are focusing on investing a hefty amount in electrification in rural areas as well as improvising grid resiliency, which boosts the growth of the overhead transmission market.

For example, in October 2024, the U.S. Department of Agriculture (USDA) announced funding of more than USD 3 billion under the New ERA program, which included nearly USD 2.5 billion for the Tri-State Generation and Transmission Association and almost USD 1 billion for six rural electric cooperatives. The funding is part of a larger effort of the United States government to build up the infrastructure of rural electricity distribution, which drives the demand for overhead transmission in different states.

Necessity for Overhead Transmission Lines in the Transportation (Railway) Sector is Augmenting Market Growth

Overhead lines are in huge demand in the railway sectors as they can transmit high-voltage electric current (25,000 volts) over long distances, reducing energy losses and making them ideal for high-speed rail systems. Overhead lines support longer and heavier trains without requiring onboard transformers, which in turn enhances operational efficiency. The lines also contribute to the process of decarbonizing rail transport, as electric trains do not emit any harmful emissions at the point of use.

For example, in September 2024, the Cabinet Committee on Economic Affairs of India approved eight railway projects with an estimated cost of USD 2931.7 million. These projects will add 900 km of overhead lines to the Indian Railways, thereby enhancing its network in seven states, namely Odisha, Maharashtra, Andhra Pradesh, Jharkhand, Bihar, Telangana, and West Bengal. Moreover, along with these projects, 64 new stations will be constructed, which, in turn, will enable the transportation of nearly 40 lakh people across the country, which will significantly drive the demand for overhead transmission lines.

Evaluating the Cost-Effectiveness of Overhead Transmission Lines in Energy Infrastructure

Evaluating the cost-effectiveness of overhead transmission lines is crucial for optimizing energy infrastructure. The analysis involves assessing various financial and operational factors associated with the construction, maintenance, and operation of overhead transmission lines. The overhead lines are found to be the most cost-effective solution for electricity transmission, with lifetime costs varying based on circuit capacity and route length. Furthermore, compliance with evolving electrical safety standards necessitates new installations of technologically advanced overhead transmission lines.

In addition, the cost-effective overhead transmission lines enable the utility sector to expand the service areas and connect new customers, which leads to increased electricity sales. The ability to transmit power efficiently over long distances with the overhead transmission line allows utilities to tap into remote renewable energy sources, which enhances sector capacity to sell electricity and improve profitability.

For instance, in February 2024, the UK Parliament (the government of the United Kingdom) declared that Overhead Line (OHL) technology is recognized as the most cost-effective method for electrical transmission in the United Kingdom, with lifetime cost estimates ranging from USD 2.81 million to USD 4.53 million per kilometer. These cost advantages position OHL as vital in optimizing the electricity transmission network. Moreover, implementing OHL technology mitigates several climate challenges (like electrocution, storms, etc.), which minimizes the risks associated with sagging lines and power outages, thereby enhancing market growth. Additionally, the technology applies to any given route length, which makes OHL a preferred choice in the United Kingdom.

The Increase in the Necessity of Smart Grid Infrastructure is Amplifying Market Growth

The demand for robust smart grid infrastructure is already on the rise, as it enhances electrical energy transfer via overhead transmission lines by optimizing efficiency and reliability. Advanced technologies such as real-time monitoring, automation, and two-way communication systems utilized in smart grids improve electricity distribution and minimize transmission losses. This infrastructure facilitates the integration of renewable energy sources, enhances fault detection capabilities, and supports proactive maintenance measures that significantly reduce outage durations, ensuring reliable electricity transmission and fueling market growth. Additionally, smart grids empower consumers to access data on energy usage, promoting informed decision-making that ultimately leads to a more resilient and sustainable energy system.

For instance, in November 2024, Hitachi Energy Ltd. and Kanonaden Entreprenad Malardalen AB signed a deal worth USD 300

million to deploy Sweden's largest-ever smart grid infrastructure solution for Svenska kraftnat to increase the power transmission capacity of existing overhead lines and renewable energy consumption from hydro and wind resources in North Sweden. Moreover, Hitachi Energy will install up to ten series compensation systems in the grid, which are scheduled to become operational by 2030. The technology is cost-effective and eco-efficient as it increases the capability of the overhead lines to transmit power to an additional one million households, thereby driving market growth.

North America is the leading the Overhead Transmission Market

North America has remained the market leader in the overhead transmission line sector and is expected to maintain its leadership throughout the forecast period due to its vast network of power transmission and the prevalence of highly advanced technologies. Additionally, the regulatory framework supports the timely approval of projects, ensuring further development of the power grid to meet rising energy needs while promoting the integration of renewable sources into the grid.

For example, in October 2023, the U.S. Department of Energy (DOE) committed up to USD 1.3 billion to three overhead transmission lines (Cross-Tie 500-kV Transmission Line, Twin States Clean Energy Link, and Southline Transmission Project) that will cross six states (Nevada, Utah, Arizona, New Mexico, Vermont, and New Hampshire). The historic commitment, enabled by President Biden's Bipartisan Infrastructure Law, will help push transformative projects forward to add 3.5 GW of additional grid capacity throughout the United States. The projects will strengthen the resilience and reliability of the grid and bring low-cost, clean electricity to American families and businesses.

Future Market Scenario (2025 – 2032F)

- With the growth of solar and wind energy projects, the requirement for efficient power transmission solutions also increases, which in turn amplifies the demand for overhead lines globally. This shift towards renewable energy is expected to provide significant opportunities for the overhead line market in the future.
- Smart grids are the future of overhead lines, as they will efficiently transfer electricity through advanced technologies, including AI and IoT. Their real-time monitoring and management enhance grid reliability and facilitate the integration of renewable energy sources into the system. Modernized systems reduce outages while lowering emissions and increasing the efficiency of energy use needed for a sustainable energy system.
- Overhead lines play a crucial role in the future of rural electrification because they provide a cost-effective means of distribution of electricity. Their installation supports the integration of renewable energy sources, improves the reliability of the grid, and fosters economic growth in rural areas to improve access to electricity and support sustainable development ultimately.

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