

North America HVDC Transmission Market By Type (High-power Rating Projects, Low-power Rating Projects), By Technology (Line Commutated Converter (LCC), Voltage Source Converters (VSC)), By Application (Subsea, Underground, Overhead, Mixed), By Country, Competition, Forecast and Opportunities, 2020-2030F

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Abstracts

Market Overview

The North America HVDC Transmission Market was valued at USD 4.61 billion in 2024 and is projected to reach USD 6.30 billion by 2030, growing at a CAGR of 5.34% during the forecast period. This market encompasses the deployment of high-voltage direct current (HVDC) systems across the United States and Canada to facilitate efficient electricity transmission over long distances with minimal losses. As aging power grids face modernization challenges and renewable energy sources expand, HVDC technology has become critical. It offers advantages such as reduced line losses, precise power flow control, and asynchronous grid interconnections, enhancing grid reliability and flexibility. With converter station advancements minimizing the environmental footprint, HVDC systems are increasingly adopted in both urban and remote regions. Supportive policies, carbon reduction mandates, and infrastructure investments further accelerate HVDC expansion, particularly to link remote renewable sources like Midwest wind and Southwestern solar to coastal demand hubs. The technology also supports growing power demands from data centers, electric vehicles, and industrial applications, solidifying its role in North America's energy future.

Key Market Drivers

Expansion of Renewable Energy Projects Across Remote Locations

The rapid growth of renewable energy installations in remote and geographically dispersed regions is a key driver of the North America High Voltage Direct Current (HVDC) Transmission Market. Projects such as solar plants in deserts, wind farms across the Midwest, and offshore wind ventures along coastal areas increasingly generate electricity far from high-demand urban zones. Traditional AC transmission struggles with distance-related losses and control inefficiencies, making HVDC the preferred solution for long-range, efficient power delivery. Its superior efficiency and capacity reduce energy dissipation and support grid reliability, crucial for integrating renewables. National targets like the U.S. aim for a carbon-free grid by 2035 and Canada's goal of net-zero by 2050 drive large-scale renewable development. HVDC plays a vital role in delivering power from distant clean energy sites to population centers. With over 60% of the U.S.'s solar and wind capacity located more than 500 kilometers from major load centers, the need for HVDC corridors continues to rise, underpinning the market's growth trajectory.

Key Market Challenges

Regulatory Fragmentation and Inter-Jurisdictional Complexity

A significant challenge confronting the North America HVDC Transmission Market is the fragmented regulatory landscape that complicates project development and inter-regional coordination. In the U.S., regulatory authority is split between federal and state entities, leading to inconsistencies in permitting standards, siting processes, and environmental reviews. This dual governance model becomes more complex when transmission lines traverse multiple states, each with its own legal requirements and stakeholder dynamics, often resulting in delays or opposition. Canada faces a similar scenario, with provincial control over transmission matters making interprovincial and cross-border projects particularly cumbersome. The absence of a unified regulatory framework elevates project risks and costs, discouraging investment and scaling of HVDC infrastructure. Stakeholders must navigate diverse regulatory obligations, including land acquisition, environmental assessments, and indigenous consultations. These complexities act as a deterrent to widespread HVDC deployment and hinder progress in aligning the grid with decarbonization goals across North America.

Key Market Trends

Strategic Integration of Renewable Energy Corridors through High Voltage Direct Current Infrastructure

A prominent trend in the North America HVDC Transmission Market is the development of transmission corridors designed to link large-scale renewable energy projects with major consumption hubs. HVDC systems are increasingly deployed to carry wind-generated power from the Midwest and solar energy from the Southwest to the densely populated coasts, where demand is highest. Their low-loss, long-distance transmission capability makes HVDC ideal for bridging the gap between remote generation sites and urban load centers. Utilities and transmission operators are adjusting long-term infrastructure plans to incorporate multistate HVDC lines that act as renewable energy highways. These investments support state and federal clean energy mandates and reduce reliance on local generation. As HVDC becomes a cornerstone of regional energy planning, its role in enabling widespread renewable integration is growing. This trend is expected to persist, supported by favorable policy incentives, climate initiatives, and increased coordination efforts aimed at building a resilient and sustainable grid.

Key Market Players

Hitachi Energy Ltd.

Siemens Energy AG

General Electric Company

ABB Ltd.

NR Electric Co., Ltd.

Prysmian S.p.A.

Nexans S.A.

Mitsubishi Electric Corporation

Report Scope:

In this report, the North America HVDC Transmission Market has been segmented into

North America HVDC Transmission Market By Type (High-power Rating Projects, Low-power Rating Projects), By Tec...

the following categories, in addition to the industry trends which have also been detailed below:

North America HVDC Transmission Market, By Type:

High-power Rating Projects

Low-power Rating Projects

North America HVDC Transmission Market, By Technology:

Line Commutated Converter (LCC)

Voltage Source Converters (VSC)

North America HVDC Transmission Market, By Application:

Subsea

Underground

Overhead

Mixed

North America HVDC Transmission Market, By Country:

United States

Canada

Mexico

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the North America HVDC Transmission Market.

Available Customizations:

North America HVDC Transmission Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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