World Markets for HV and EHV Cable

Underground and Subsea Cable Market Report Ed 2 2021

- **A comprehensive report on the current usage, consumption, future demand and supply of EHV and HV cable, both underground and subsea, throughout the world.**
- **Current installations of underground and subsea cable - analysed by voltage and by km of cable.**
- **Market forecasts for EHV & HV underground and subsea in km of cable and $ value, 2021 to 2026.**

The report is based on two comprehensive surveys of cable length in km by voltage:

1. The **land based transmission and distribution networks of 162 countries**. The objective is to position EHV and HV cable within the entire network systems from EHV transmission to LV distribution in 2021, analysing each national grid by overhead lines, underground cables, and voltages. The data is derived from a survey of 186 utilities, together with secondary research of national sources.
2. **Worldwide subsea cables** - land-to-land interconnections, export and array cable for wind farms, power-from-shore cables for oil & gas platforms, analysed by voltage. Based on secondary research of 373 current and proposed subsea power cable systems.

Analysis by five voltage groups:

EHV	EHV	HV	MV	LV
≥320 kV	220<320 kV	33/35<220 kV	1<35 kV	< 1000 V

The market for HV and EHV cable is changing, on both the supply and demand sides. Suppliers are developing new technology with higher voltage cables and thinner dielectric insulation. On the demand side, regulation is being enacted for the new generation of EHV transmission corridors, city networks and environmental hazards. User practices are changing. Maritime grids are being constructed, with large scale offshore substations and HVAC/HVDC converter stations linking multiple arrays of wind turbines. Platforms are moving further from shore, with longer EHV export cables; wind farms are becoming larger with more turbines of higher capacity, with longer array cables and HV instead of MV. These issues are identified and discussed.

Opportunities for HV land-based underground cable - underground amounts to 17.4% of total network mileage and 2.4% of the HV networks. Globally, transmission is in a phase of growth and modernisation involving large expenditures. Many national studies have outlined the pros and cons and made recommendations for EHV & HV underground and identified cases for full and partial undergrounding. The report lists these opportunities and relevant national policies which will shape future markets.

Opportunities for HV subsea cable - The current state of the three major subsea cable segments are outlined and future developments flagged; land and island connections, offshore wind power, oil & gas power-from-shore and umbilicals. The report identifies the growth areas including trends from MV cable to HV.

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The technologies of HV and EHV underground and subsea cables are outlined; high pressure fluid filled pipe (HPFF), high pressure gas filled pipe (HPGF), self-contained fluid filled (SCFF)/mass impregnated MI, EPR and XLPE dielectric insulated cable. The differences of technology are outlined, with advantages and disadvantages for each type, with historical and present usage trends.

New HV technologies are being commercialised; **Superconductors** are already well established in medical robotics , and are starting to be installed in power transmission applications; **GTW - Gas to Wire**, is being promoted and the first project is about to take off, converting gas to electricity at the offshore platform site and transporting it to land grid via offshore wind export cables, using surplus capacity. Manufacturers are pushing the boundaries to develop thinner cables and higher voltages for EHV and HV dielectric cables.

Company profiles of key HV and EHV cable players.

Prysmian
General Cable (Prysmian)
Nexans
NKT High Voltage Cables
Cablel® Hellenic Cables
JDR
Tele-Fonika Kabel S.A
Southwire
Parker Scanrope
Leoni
Sumitomo
Fujikura
Hitachi Cable
J-Power
Finolex J-Power Systems Private Ltd (FJPS)
Furakawa
LS Cable
Iljin Cable
Zhongtian Technology [ZTT]
Ningbao Orient Cable
Far East Cable Co Ltd
Wanda Group Holdings Co Ltd
Baosheng High Voltage Cable Co Ltd, BHVC
Jiangsu Shangshang Cable Group

Global market shares, European market shares, for land-based UGC and subsea HV and EHV cable

Production of HV and EHV cable is a complex process taking quite a long time and demanding continuous monitoring. Several of the leading international manufacturers were unwilling to divulge production capacity. We have assessed capacity on a regional basis, from company reports, from actual production and estimated utilisation.

Production of subsea cable is more complicated than for underground cable, requiring longer cable lengths and additional mechanical protection. Subsea cable is ordered as a customised product with longer lead times than underground cable.

Suppliers of subsea cable are outlined. Production capacity is still limited, but new entrants are coming into the market in regions where subsea cable is starting a growth trend.

Rights of Way are critical in deciding between overhead lines and underground cable. Combined with EMF - electromagnetic fields - the issue may not always be clear cut and is subject to increasing regulation. Parts of UGC paths produce higher EMF than overhead aerial lines. These issues are discussed in the report.

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