The intelligence gap: why Europe's subsea power cable boom demands a new approach to market data

As Europe races toward 300 GW of offshore wind by 2050, the subsea power cable market is under unprecedented strain. Skyrocketing demand, generational technology shifts and complex cross-border projects are exposing gaps in traditional market intelligence, forcing the industry to adopt AI-driven, real-time data systems to track supply chains, project progress and regulatory shifts at scale.

Europe's offshore wind industry has a grand plan. Under the Joint Offshore Wind Investment Pact for the North Seas, agreed in Hamburg in January 2026, nine governments including Belgium, Denmark, France, Germany, Ireland, Luxembourg, the Netherlands, Norway and the United Kingdom, together with their transmission system operators and more than 100 industry companies, have aligned behind a coordinated build-out of up to 15 gigawatts per year with a target of 300 gigawatts by 2050, eight times the current capacity.

For an industry that has spent years navigating policy uncertainty, the alignment between states, TSOs and the supply chain in a single document is significant.

The infrastructure implications run deep. Every gigawatt of offshore wind requires a subsea cable to reach shore, and the pact targets 100 GW of that total coming from joint cross-border projects, including multi-purpose interconnectors that combine offshore wind export with cross-border electricity trading.

The subsea power cable market is being built on foundations that are already under strain: Europe's leading subsea cable manufacturers, NKT, Prysmian and Nexans, are collectively carrying order backlogs on the order of €35 billion, reflecting unprecedented demand for high-voltage transmission infrastructure.

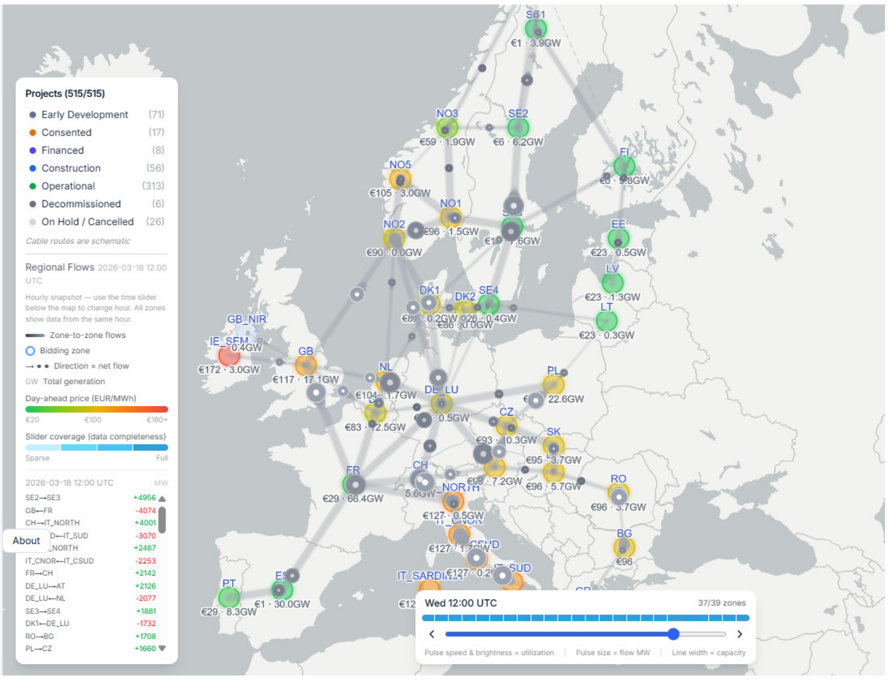
But here's the challenge that doesn't make the headlines: the industry that needs to deliver all this cable is already stretched to its limits. Manufacturer lead times for HVDC systems stretch to eight years or more.

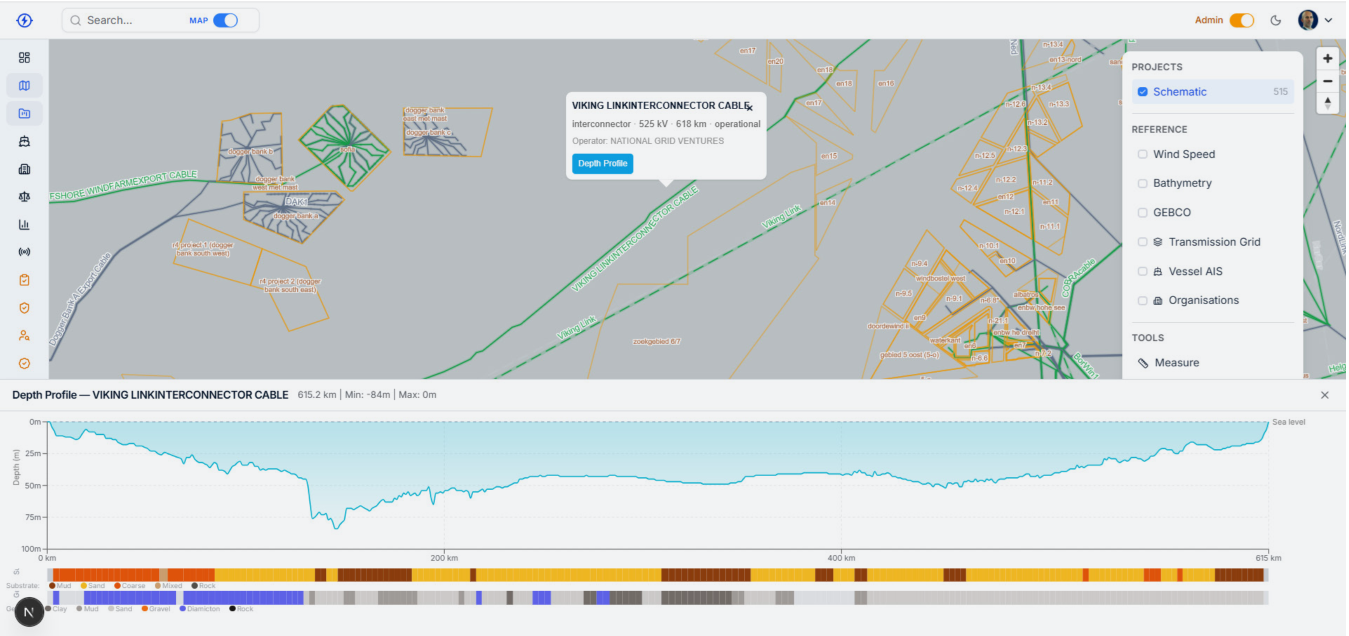
The intelligence questions that matter here are not simple. Which governments will sustain the build-out through the next election cycle? Can the supply chain, vessels and grid infrastructure keep pace? Which projects will be delayed? Where does execution risk concentrate?

Five trends reshaping the market

The 525 kV revolution

The industry is in the middle of a generational technology leap. The established standard for HVDC offshore wind grid connections, 900 MW





at ±320 kV, used across Germany's first wave of BorWin, DolWin and HelWin systems, is giving way to 2,000 MW at ±525 kV. That's a 2.2x capacity increase per system, meaning fewer cable systems are needed to connect the same amount of wind capacity.

Developers are now specifying it across every major new programme: the Netherlands' 14 planned 2 GW connections, totaling 28 GW; Germany's next-generation BalWin and LanWin systems and Denmark's Bornholm Energy Island. But only a handful of manufacturers can currently produce XLPE cable at this voltage, and the race to qualify is reshaping the supplier landscape.

New entrants like LS Cable & System, which broke ground on the largest US HVDC subsea cable factory in April 2025, and China's ZTT, which has already secured European offshore wind contracts, are emerging to compete and to supply much-needed capacity.

Power in the supply chain

The financial results from the Big Three cable manufacturers tell you everything. Prysmian hit its 2028 Transmission margin target of 18% in 2025, three years early. Not just because of good execution, but probably also pricing power in a market where demand far outstrips supply. The company reported a backlog exceeding €17 billion, with transmission revenues growing 28.7% organically to €3.26 billion.

NKT is building what will be the world's largest offshore cable factory at Karlskrona in Sweden, featuring a 200 metre extrusion tower and creating 500 new jobs, with full operations from 2027. Prysmian has expanded its Pikkala plant in Finland with a new high-voltage production tower, increasing capacity for long-length HVDC subsea cable manufacturing.

Nexans is investing €90 million in a copper recycling facility capable of processing up to 80,000 tonnes per year from scrap, to feed wire rods into its vertically integrated operations.

All three are simultaneously commissioning new cable laying vessels. NKT's Eleonora will be methanol-powered and operational in 2027, Prysmian's Monna Lisa was inaugurated in 2025 and will enter service by 2028 as the eighth vessel in its fleet, and Nexans' Electra is due in 2026.

The heavier 525 kilovolt cables require vessels with higher-specification carousels and tensioners, and not every existing vessel in the global fleet can handle the new cable weights and bend radii.

From radial to coordinated to meshed

Offshore transmission architecture is evolving in distinct stages. The radial model, each wind farm connected by its own dedicated cable straight to shore, has dominated the UK's offshore build-out.

Germany took a different path from the start, with TSOs centrally planning and building hub-and-spoke HVDC systems that aggregate multiple wind farms through shared offshore infrastructure before transmitting to shore.

The next stage is meshed: interconnected nodes where power can flow between hubs, mixing transmission and generation in a shared offshore grid. Germany's HeideHub, where 50Hertz and TenneT are building an onshore DC switchgear connecting two separate 2 GW offshore HVDC systems to a single node by 2032, is one of the first steps in that direction.

Denmark's Bornholm Energy Island is an early example of what meshed infrastructure looks like in practice: simultaneously a collection hub for surrounding offshore wind farms and an interconnector between Denmark and Germany, with power able to flow in either direction depending on market conditions.

The UK's Holistic Network Design represents its own shift away from the radial model, coordinating roughly 50 GW of offshore connections into a shared plan and several hybrid interconnectors are already in development, including Nautilus in Belgium, LionLink in the Netherlands and GriffinLink in Germany, each combining offshore wind export with cross-border market integration.

This creates formidable new technical challenges. Multi-terminal HVDC requires interoperability between converter stations from different vendors, HVDC circuit breakers, still maturing technology and entirely new grid codes.

Meanwhile, Nexans demonstrated the frontier of what's physically possible by completing the Tyrrhenian Link with a then-world-record installation of 500 kV HVDC cable at 2,150 metres depth, two separate links connecting Sicily to Sardinia and Sicily to the Italian mainland. That record has since been surpassed by Nexans itself, reaching 3,000 metres during sea trials for the Great Sea Interconnector in March 2026.

Hybrid interconnectors and political headwinds

Perhaps the most strategically interesting new project category is the hybrid interconnector, an infrastructure that combines offshore wind export with cross-border electricity trading. Nautilus will connect Belgium's Princess Elisabeth energy island to the UK. LionLink will link a Dutch offshore wind platform to Suffolk. GriffinLink, a collaboration between TenneT and National Grid, will connect UK and German offshore zones.

These projects are commercially attractive because they generate two revenue streams: wind export capacity and cross-border trading margin. The Hamburg Declaration's explicit commitment to multi-purpose interconnectors validates this model at the highest political level.

But not all governments agree. Norway, which currently has more interconnector capacity per capita than any other European nation, has effectively halted new cross-border cable development, with the government committing to reject any new interconnector proposals before 2029.

Following the September 2025 election, which returned Labour to power, no major party in the Storting currently supports new interconnectors. A broad majority in the Storting opposes further interconnectors, citing concerns about electricity price impacts on domestic consumers. Several planned hybrid corridors are stalled as a result.

The German corridors effect

An often-overlooked pressure point: both NKT and Prysmian cite Germany's onshore HVDC corridors, SuedLink, SuedOstLink and others, as major revenue drivers in their latest results. These are technically subsea-specification HVDC cables buried underground across hundreds of kilometres of German countryside, connecting North Sea wind power to southern demand centres.

German corridor cables directly compete for the same constrained manufacturing capacity, the same specialised factories, and the same engineering teams as offshore cables and cross-border interconnectors.

Why this market is uniquely hard to track

Behind these headline trends lies a data challenge that compounds the supply chain pressures. The subsea power cable market is one of the hardest sectors in the energy industry to track comprehensively.

Consider a single project: Dogger Bank, the world's largest offshore wind farm. Across its three phases, it involves six converter stations, three offshore, three onshore, multiple cable segments with different specifications, different ownership stakes at each phase, pending OFTO transfers to competitively-tendered transmission owners, and data scattered across developer announcements, Ofgem regulatory filings, converter manufacturer press releases, Hitachi Energy across all three phases, and cable supplier delivery schedules. No single source contains the complete picture.

Scale that across hundreds of active projects globally and the problem becomes clear. The UK alone has reached Tender Round 13 in its OFTO programme, representing billions of pounds in regulated infrastructure investment, with roughly 25 GW of further offshore wind grid connections in the planned pipeline. Germany's TSO-build-own model creates an entirely different data landscape to the UK's competitive tender regime.

Norway's developer-full ownership approach differs again. Each regulatory model generates different documentation, different disclosure timelines, and different financial structures, all describing fundamentally similar physical infrastructure.

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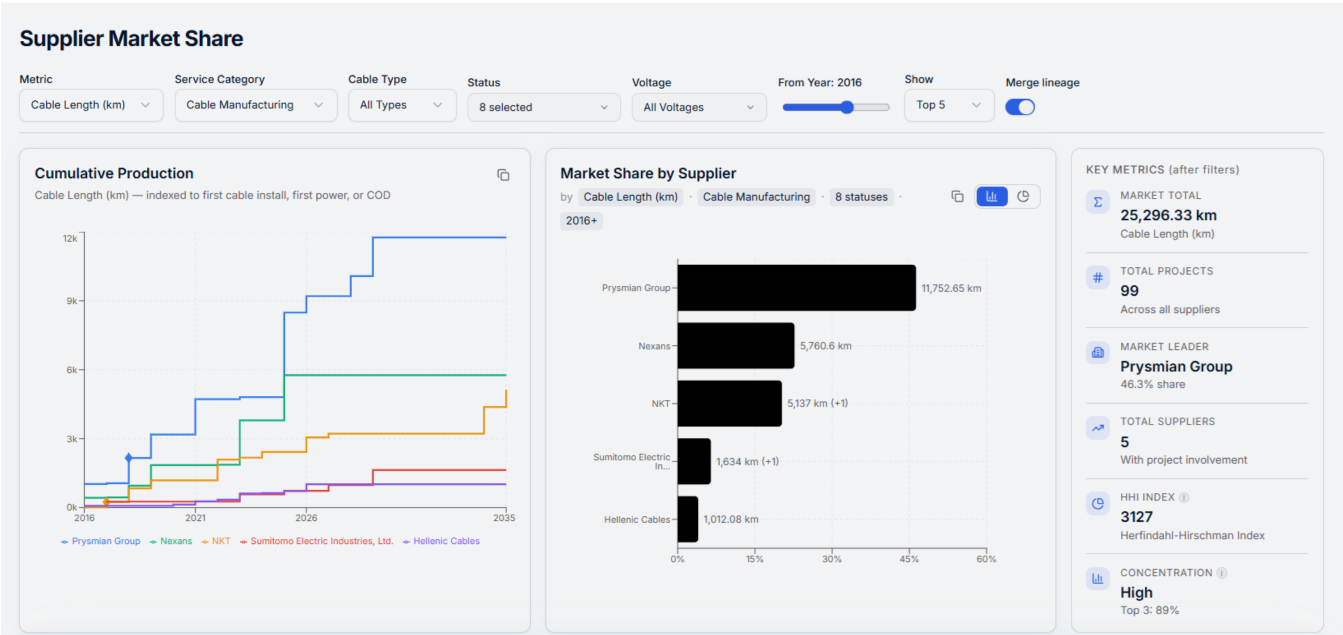
Projects don't stand still, either. Denmark's North Sea Energy Island concept evolved from a 10 GW artificial island to a scaled-back platform-based design under cost pressure. Nexans' Great Sea Interconnector between Greece and Cyprus, €1.2 billion in the company's backlog, was rescheduled mid-execution with an uncertain timeline. Projects are renamed, for example, Germany's LanWin1 became BalWin1, merged, restructured and occasionally cancelled outright.

How AI is closing the gap

This convergence of market scale, supply chain constraints, and data complexity is driving a fundamental shift in how energy market

Country	Model	Builder	Operator	Cost Recovery	Risk (Build / Ops)	Operational	Pipeline
United Kingdom	OFTO (competitive tender)	Developer builds	OFTO (25-year licence)	Socialised	Developer / OFTO	11.6 GW	37.8 GW
Germany	TSO-build (centralised)	TSO (TenneT / 50Hertz / Amprion)	TSO (permanent)	Socialised	TSO (with EnWG §17e delay compensation to developers) / TSO	9.7 GW	35 GW
Netherlands	TSO-build (TenneT sole)	TenneT (sole TSO)	TenneT (permanent)	Regulated tariff	Government pre-surveys de-risk; TenneT builds / TenneT	4.9 GW	23 GW
Denmark	Evolved (TSO → developer-pays)	Energinet (legacy) → developer (Thor+)	Energinet or developer (varies)	Developer-borne	Developer (from Thor onwards) / Developer or Energinet (transfer varies)	2.7 GW	10.5 GW
France	TSO-build (RTE sole)	RTE (sole TSO)	RTE (permanent)	Socialised	RTE (liable for delay costs up to 3-year cap) / RTE	1.5 GW	26 GW
Belgium	TSO-build (Elia + developer contribution)	Elia (TSO)	Elia (permanent)	Hybrid	Elia / Elia	2.3 GW	3.5 GW
Ireland	Plan-led TSO-build (EirGrid)	EirGrid (Phase 2+); developer (Phase 1)	EirGrid (permanent)	Regulated tariff	EirGrid (Phase 2+) / EirGrid	25 MW	5.2 GW
Finland	Mixed (territorial + EEZ split)	Developer (territorial); Fingrid	Developer / Fingrid	Hybrid	Developer (territorial); TBD (EEZ) / Developer /	0 MW	—

The subsea power cable industry has never been larger, more complex, or more consequential to Europe's energy future. The intelligence that supports it needs to match that ambition.



intelligence is produced. Experienced analyst teams can track hundreds of projects, but not at the depth the market now demands.

In an era where investors, developers and TSOs expect granular, current, source-traced data across every active project and detailed analysis on top of it, the traditional model of regulatory filings, PDF reports and quarterly database updates struggles to keep pace.

AI-powered intelligence systems can now continuously scan thousands of sources: regulatory portals, manufacturer press releases, TSO network development plans, planning applications, and industry publications. Rather than simply flagging keywords, modern extraction models can pull structured data from unstructured documents, including cable specifications, lifecycle milestones, ownership structures, and supply chain relationships, with each data point traced to its source.

A single offshore wind grid connection may require over 200 structured data fields to fully characterise: cable type, voltage, HVDC configuration, insulation technology, converter supplier, installation vessel, route length broken down by subsea and land portions, burial depth, landfall coordinates, ownership model, CAPEX estimates and dozens more.

This depth of structured data enables analyses that were previously impossible at market scale: benchmarking lead times from final investment decision to commercial operation across hundreds of projects; tracking supplier concentration indices to quantify single-vendor risk; mapping technology adoption curves as the industry transitions from 320 kV to 525 kV; and identifying which installation vessels have the specifications to handle the next generation of heavier cables.

Critically, AI agents can cross-reference extracted data against multiple independent sources, flagging discrepancies and contradictions for expert human review. This isn't about replacing domain expertise. It's about ensuring that analysts spend their time on insight and interpretation rather than data collection and entry.

When Prysmian announces a contract win or Norway freezes its interconnector programme, that intelligence can be captured, structured, and connected to the broader market picture within days rather than accumulating in an inbox until the next report cycle.

Looking ahead

Three hundred gigawatts of North Sea offshore wind doesn't even consider the additional cable demand from dedicated point-to-point interconnectors, domestic grid reinforcement, and oil and gas platform electrification. With €35 billion in manufacturer backlogs, a generational technology shift to 525 kV, the emergence of meshed offshore grids and political currents that can freeze entire national programmes overnight, this market's complexity is growing faster than the industry's ability to track it by conventional means.

The organisations that will thrive in this environment, whether developers securing cable supply, investors underwriting transmission assets, TSOs planning network expansion, or vessel operators positioning their fleets, will be those with a complete, current, and connected picture of the market. Supply chain capacity. Regulatory shifts. Technology transitions. Project status changes. All linked, all traceable, all kept current.

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