

Subsea Infrastructure Failures: Market Risks, Costs, and Opportunities

Investing in smart subsea technology will be key to meet a growing market

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Subsea Infrastructure Failures: Key Asset Types

Asset uptime is paramount for reliability; subsea applications pose several challenges throughout the project lifecycle. Infrastructure failures have led to an increasingly challenging market and financing conditions for asset owners and present a growing market opportunity for service companies.

Three main subsea infrastructure categories:

Power Cables

- Can generally be split between 3 types:
  - Inter-array – Cables between offshore assets such as wind turbines.
  - Export – Cables from offshore renewables sites to the mainland.
  - Transmission – Cross-border or island connecting cables to carry grid power.
- Estimated 50,000+ km of subsea power cables in service globally, with sharp growth driven by offshore wind and cross-border interconnectors.
- Cable diameters typically 100–250 mm (HV export cables can be larger).
- Increasingly vital for energy transition infrastructure and grid resilience.

Telecoms Cables

- ~1.4 million km of subsea telecom cables globally.
- Carry ~95% of global internet, voice and data traffic.
- Cables typically 17–50 mm in diameter, depending on water depth and required protection.
- Installed at depths of up to 8,000 metres in deep ocean basins.
- While generally buried 1–3 metres deep in shallow waters, most of the cable will simply be laid on the sea floor.
- Over 500 active cable systems in operation, with 70 new systems planned by 2027.

Oil & Gas Pipelines

- ~32,000 km of subsea pipelines worldwide, largely concentrated in the North Sea, Gulf of Mexico, Persian Gulf, and APAC.
- Transport crude oil, natural gas, and processed hydrocarbons from offshore fields to shore
- Pipeline diameters range from 6 inches (150 mm) to 44 inches (1,100 mm).
- Critical to global energy supply - over 80% of Europe's gas imports arrive via subsea pipelines.
- Usually trenched and buried in coastal and nearshore zones up to 5m. In deepwater, pipelines are often left exposed, with rock dumping or mattresses used for stability or crossings.

So What?

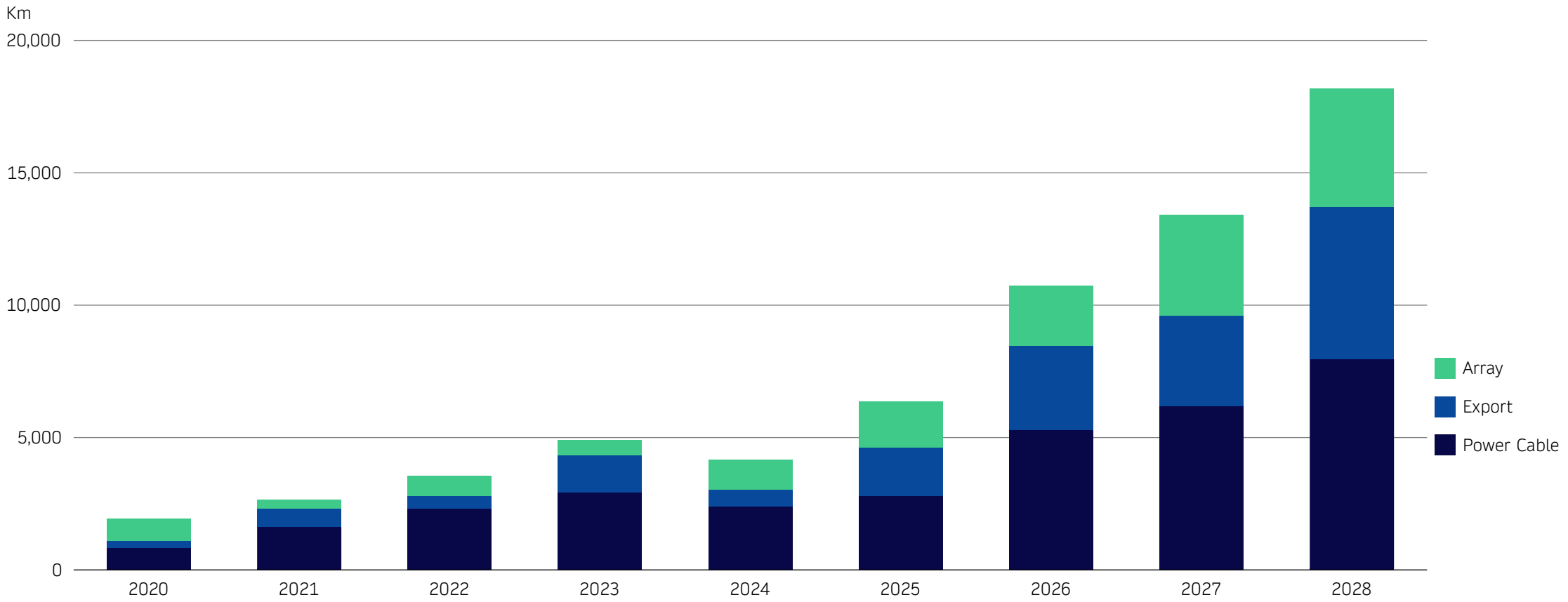
- Insurers are pulling back on subsea construction, demanding much higher premiums or exiting the market entirely. New war-and-terrorism clauses carve out "malicious acts" like state-sponsored needle attacks and shift proof burdens onto the insured, making sabotage claims far harder to win.
- Asset owners and operators are likely to shift greater focus towards monitoring and preventative measures as construction demand increases and assets get harder to insure.

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Subsea Infrastructure Failures: Power Cables

Increased energy mix among nations and advances in offshore wind technology have driven a surge in demand for subsea power cables.

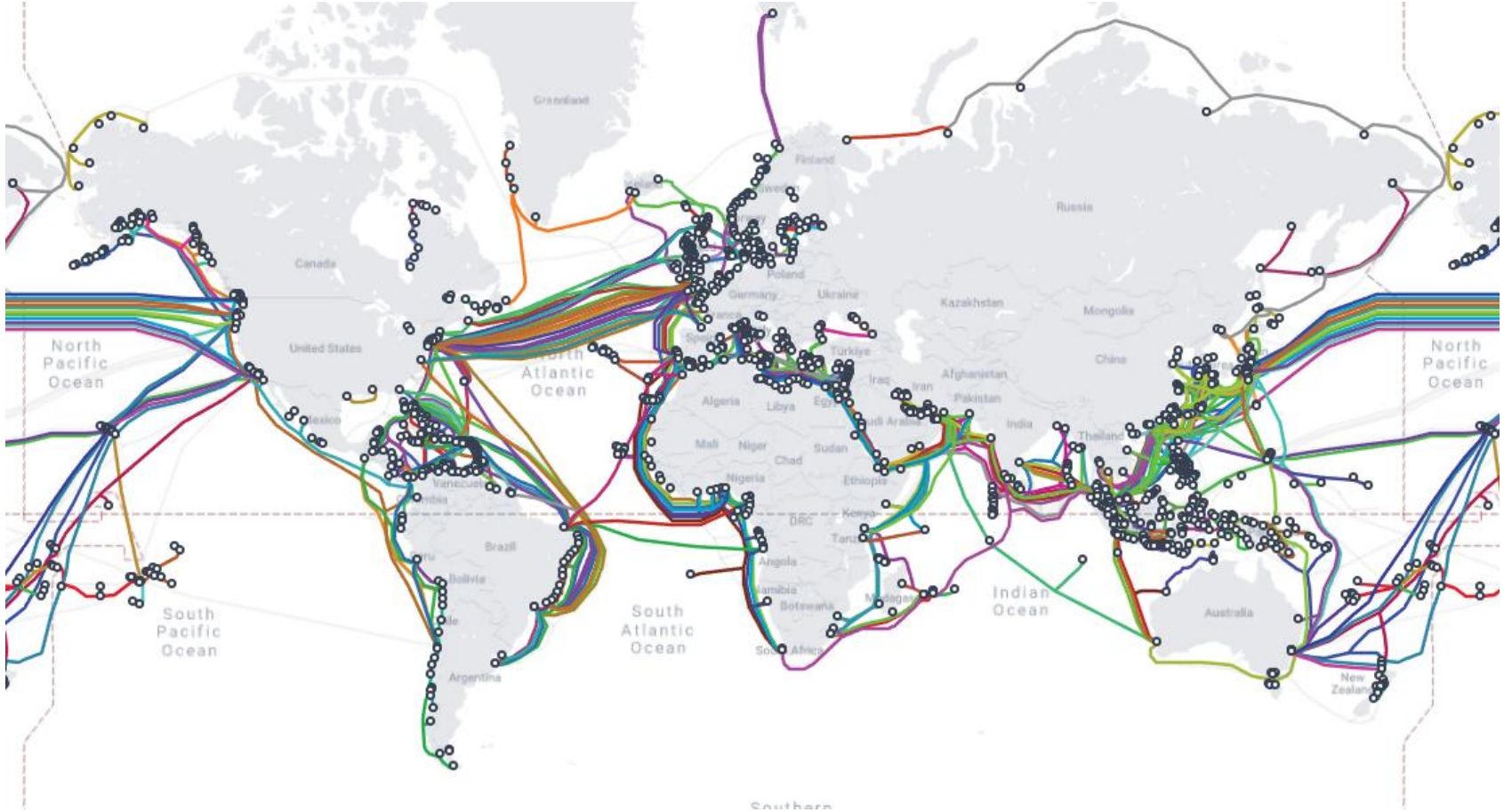
Cable Demand Forecast by Type and Installation Year | *Spinergie 2024*



Subsea Infrastructure Failures: Telecoms Cables

Over 500 cable systems are currently in service using over 1.4 million km of cable. The network currently experiences approximately 150-200 faults per year that require repair.

Submarine Cables in Service, 1989-2023 | *Telegeography 2024*

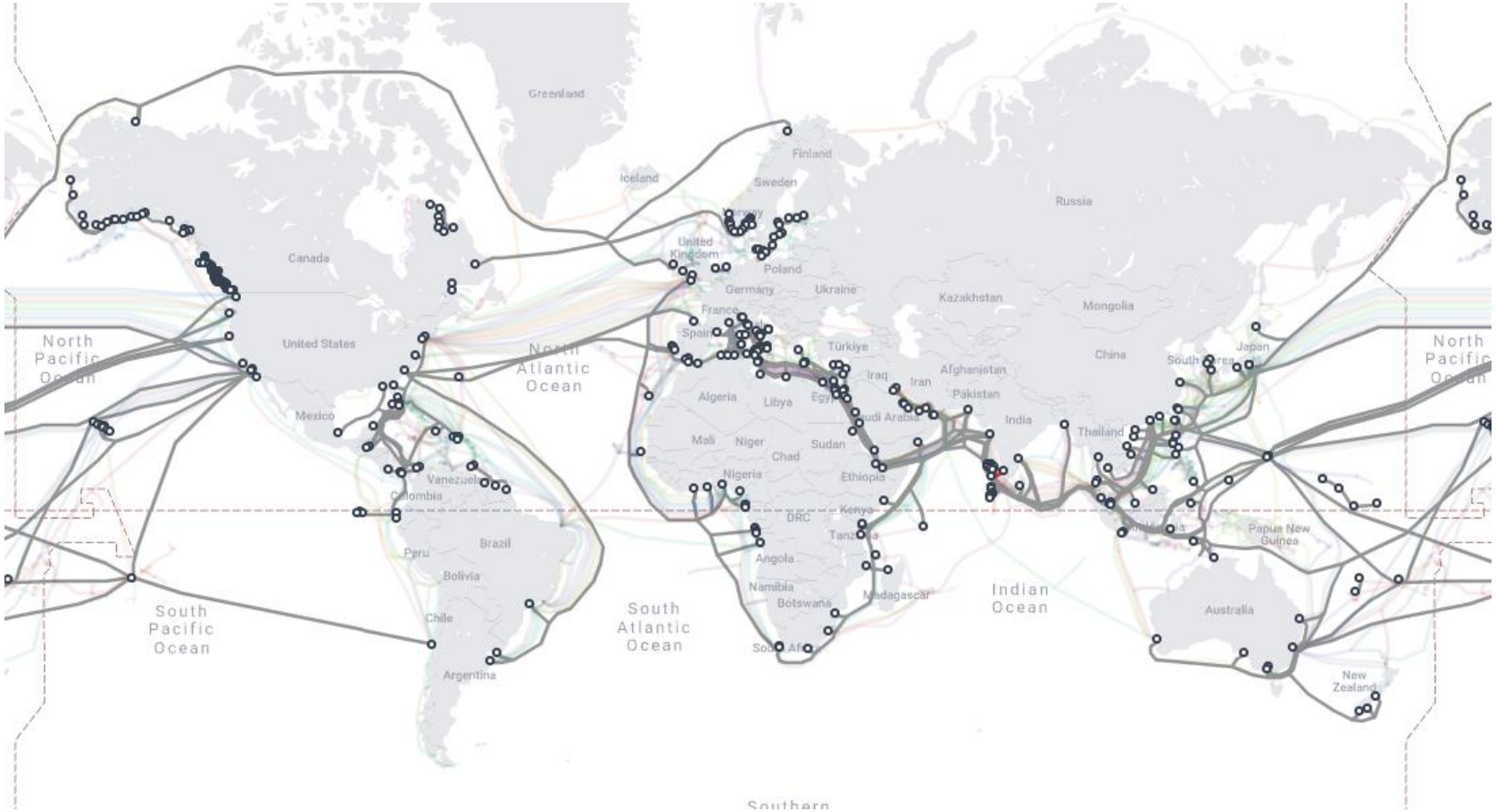


- Over 500 telecom cable systems in service globally, spanning 1.4 million km — enough to circle the Earth 35 times.
- The network experiences 150–200 faults per year requiring repair, costing $1–3 million per incident (excluding downtime and business interruption) and take ~20 days on average.
- Disruptions severely affect developing nations and remote islands reliant on a single system.
- Global economies rely on these cables for financial transactions, communications, energy trading, and national security.

Subsea Infrastructure Failures: New Telecoms Cables

In the next four years, ~70 new cable systems will be launched globally. This significant increase will further strain the vessel market, as more vessels will be needed for maintenance and repairs.

Submarine Cables Coming into Service, 2024-2027 | *Telegeography 2024*

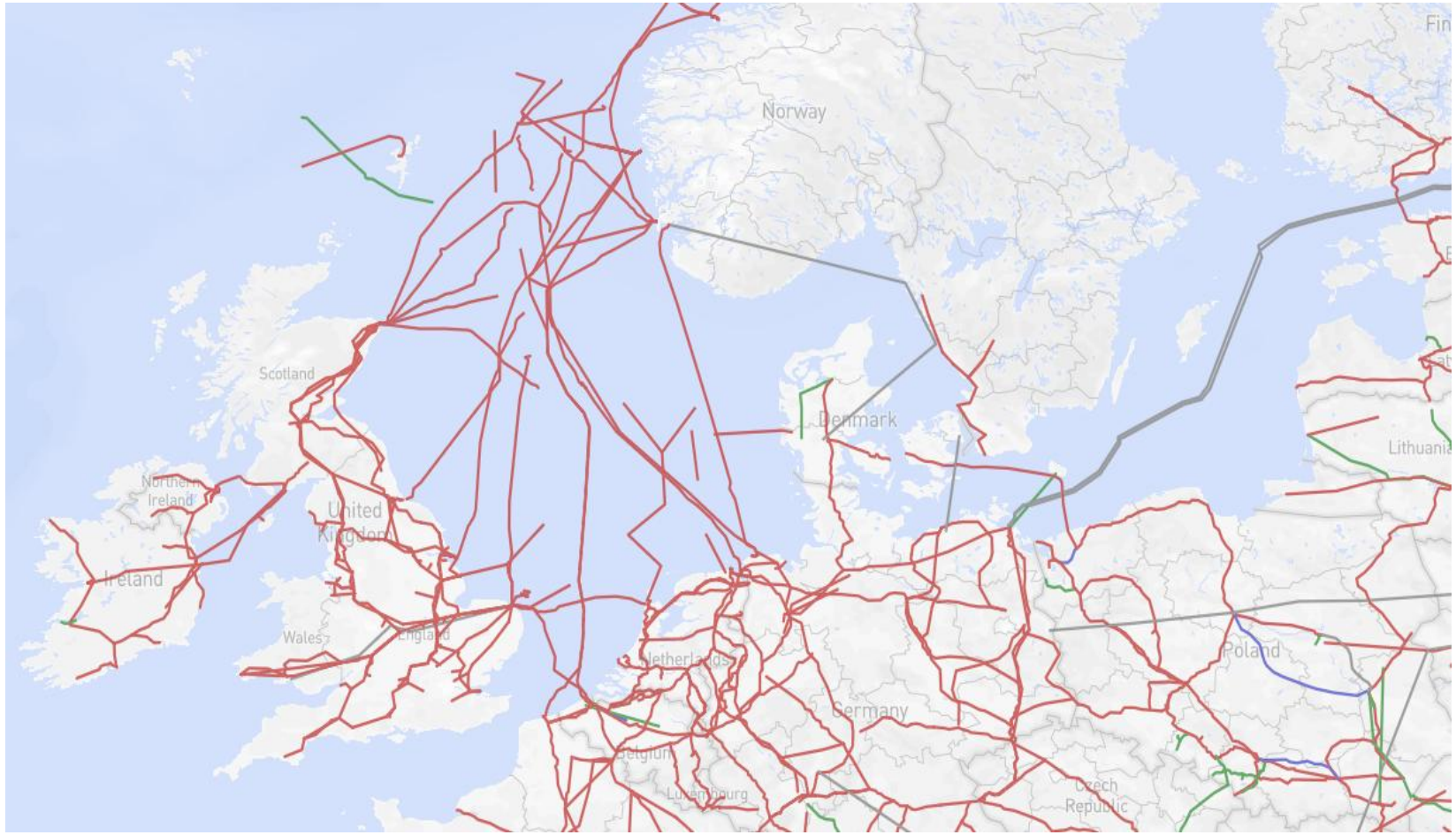


- 70 new cable systems due for installation between 2024–2027, with growing being driven by hyperscale data demand.
- Notable projects:
  - 2Africa (45,000km) by ASN.
  - Southeast Asia–Japan 2 (10,500km) by NEC.
- Lower installation costs are fuelling smaller projects for island nations.
- As cables grow longer, deeper, and more remote, traditional vessel-based inspection and repair will become slower, riskier, and more expensive.
- Autonomous and unmanned systems are being trialled to improve response and reduce costs.

Subsea Infrastructure Failures: Pipelines

Inspection, protection, and maintenance of subsea pipelines is critical for Europe's energy security, which has been proven to be vulnerable in recent years.

European Gas Pipeline Map | *Global Energy Monitor 2024*



- Over 80% of Europe’s gas is supplied via subsea pipelines from Norway, the UK, and North Africa.
- The Nord Stream sabotage (2022) exposed vulnerabilities in critical offshore infrastructure and raised broader concerns over the security of subsea cables and pipelines in international waters.
- Rapid response capability is essential to protect supply resilience.

Subsea Cable Failures: Market Drivers

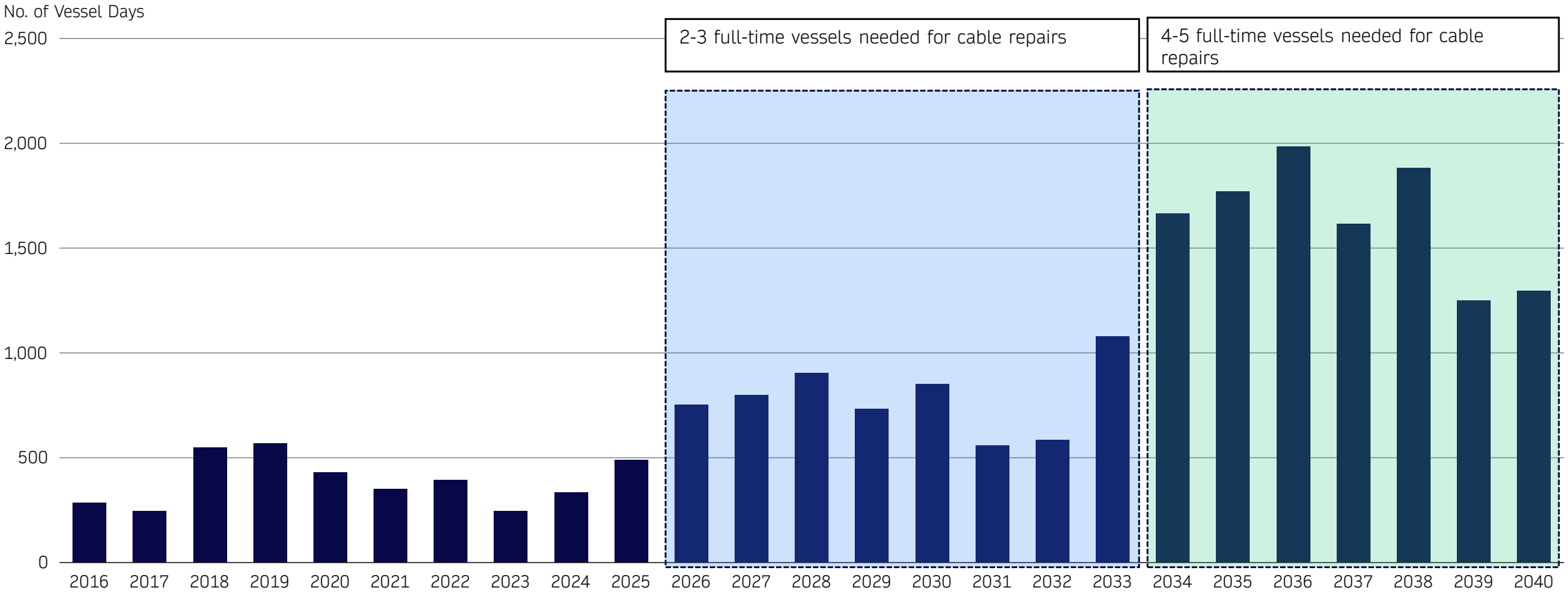
The market for companies providing cable IRM services is going to grow significantly over the next 10 years, driven by domestic policy and international trends.

Driver	Description	So What?
Global Data Demand	The increased development and adoption of cloud computing, AI and machine learning, Internet of Things, video streaming, and communications will drive global data usage to double over the next 3 years.	Significantly more cable systems will be required to meet this demand, leading to more faults each year.
Renewables Transition	Offshore renewables projects have been a focus for many major economies globally as they transition from fossil fuels.	Inter-array and export cables for offshore projects and power transmission cables are the most expensive and timely to repair, and will increase exponentially over the next 25 years.
Increased Globalisation	80% of global trade is seaborne and 65% of oil & gas is extracted offshore. As these markets, along with tourism, grow our oceans become more congested, with key shipping lanes often crossing cable systems.	A large portion of telecom and power cable faults are due to ships anchors or fishing equipment. This will only increase and more vessels are on our ocean.
National Security & Rising Global Tensions	Sabotage of critical infrastructure has become an increasingly used tactic in recent years, targeting all subsea infrastructure from power & telecoms cables to oil & gas pipelines.	The ability to react to faults quickly is key for a governments ability to maintain energy and communications security.
Environmental Factors	Ocean currents can stress suspended submarine cables and seabed movements or scour can expose buried cables, leaving them more prone to damage or degradation.	As assets age they can become increasingly prone to corrosion and fatigue, leading to higher fault rates.

Subsea Cable Failures: Vessel Demand

There is already a measurable demand for vessels providing O&M services on subsea infrastructure, and autonomous systems will be critical to alleviating pressure on vessel supply.

Number of Vessel Days Required for O&M on Wind Export and Interconnector Cables | *Spinergie 2024*



Subsea Cable Failures: Case Studies

Recent high-profile cases highlight the rising threat, cost, and effect cable failures have on populations, governments, and operators worldwide.

	SEACOM	elering
Date	March 2024	December 2024
Location	South & East Africa	Finland / Estonia
Incident	Submarine telecom cables between South Africa and eastern Africa suffered breakages, including anchor damage linked to regional conflict. Connectivity fell sharply, affecting internet performance for millions across South and East Africa.	Suspected sabotage by tanker anchor in Gulf of Finland severed power transmission cable EstLink 2 between Finland and Estonia, reducing the countries cross-border capacity by 2/3.
Downtime	6 weeks	8 weeks
Cost	$8m	€50-60m

Subsea Cable Failures: The Bottom Line

As subsea cable networks grow, traditional vessel-based repairs will become unsustainable. Investing in autonomous and remote systems is crucial to manage costs, downtime, and resilience.

The Problem	The Solution
Rising cable faults	Invest in proactive monitoring
Vessel shortage and day rate inflation	Deploy AUVs, USVs, ROVs
Multi-million £/$/€ repair costs	Reduce repair time and system downtime through faster fault detection
Increasing infrastructure risk	Build operational resilience with autonomous monitoring systems

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