Divergent EU-China Narratives and Submarine Cable Governance

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Abstract

Submarine fiber-optic cables form the physical backbone of the global digital economy, yet geopolitical securitization increasingly shapes their governance. This paper examines the diverging regulatory narratives and operational frameworks governing subsea cable networks in the European Union (EU) and the People's Republic of China (China), evaluating the remaining space for bilateral cooperation. While the EU has shifted from a market-oriented connectivity model to defensive 'de-risking' and trusted-vendor mandates, China enforces state-directed vertical integration and tight control of infrastructure under its Digital Silk Road and critical information infrastructure statutes. Through a comparative analysis across three policy domains, this study demonstrates that institutional friction varies significantly by operational layer. Cooperation in hardware manufacturing and network deployment remains highly unlikely due to deficits in strategic trust. Conversely, symmetrical vulnerabilities to accidental cable disruptions and shared climate-monitoring interests preserve narrow windows of functional necessity. Expedited maritime clearance protocols for repair vessels under international law and multilateral sharing of aggregated environmental telemetry offer viable, low-risk avenues for confidence-building. Targeted technical cooperation could reduce mutual misunderstandings and insulate critical global digital infrastructure from broader geopolitical frictions.

Keywords: Submarine cables, telecommunications, critical infrastructure, economic security, strategic narratives

1. Introduction

Submarine fiber-optic cable networks are the primary physical backbone of the global digital economy, routing around 99% of all internet traffic (International Telecommunication Union [ITU], 2026). The governance of these networks lies at the intersection of contradictory imperatives. On the one hand, global actors are inherently interdependent in this domain. Their economies are bound to the same fragile underwater grid, and most international operations rely on the unhindered, constant access these lines provide. On the other hand, a handful of critical actors build this grid and control access to capital and advanced technology, creating structural dependencies. Politically, this interconnectedness is increasingly viewed as a liability. The current geopolitical landscape is defined by intense securitisation, marked by EU suspicion toward third-country providers and China's push for homegrown, self-reliant technologies. This friction forces international actors into a delicate balancing act, necessitating a baseline level of pragmatic cooperation despite heightened national security concerns.

The purpose of this paper is to unpack this dynamic and compare the EU's and China's policy approaches to specific domains of subsea infrastructure construction, maintenance, and data governance. The remainder of this paper is organized as follows: Section 2 reviews the existing literature, followed by the methodological framework in Section 3. Section 4 contrasts the EU's and China's narrative and policy approaches to submarine cable governance. Section 5 presents comparative case studies that analyze key policy domains to assess the scope for Brussels-Beijing cooperation. Finally, Section 6 summarises the empirical findings and outlines pathways for future research.

2. Literature Review

The literature establishes underwater cable networks as vital digital backbones that face escalating physical, cyber, and hybrid threats. Studies on global subsea infrastructure emphasise that these networks suffer from structural vulnerabilities, including restricted maintenance fleets, limited alternate routing pathways, and bureaucratic repair delays (Insikt Group, 2025, pp. 1, 4). Policy analyses highlight how outdated legal frameworks under the United Nations Convention on the Law of the Sea create enforcement gaps

against sub-threshold hybrid actions and vulnerabilities in the cyber domain (Su Wai Mon, 2026). Furthermore, comparative threat assessments demonstrate that subsea vulnerabilities extend into space and digital realms (Girardi & Tan, 2025, pp. 2, 12–14). Addressing these vulnerabilities involves proactive regulatory frameworks, real-time threat detection, and public-private cooperation to protect international data corridors (Putter & Henrico, 2025, pp. 132, 138, 144–146).

Scholarship on regional responses focuses primarily on governance models, legislative toolboxes, and multilateral maritime surveillance in Europe and Asia. In the European context, Besch and Brown (2024, pp. 3-5, 12) analyze how Europe's reliance on subsea infrastructure is compounded by a low number of domestic cloud providers and limited repair ships, prompting NATO and the European Union to enhance naval monitoring. Reviews on European policies highlight structured interventions such as the EU Action Plan on Cable Security, the Cable Security Toolbox, the NIS2 Directive, and funding via the Connecting Europe Facility (Center for Cybersecurity Policy and Law [CCPL], 2026). In the case of Southeast Asia, research highlights the Information Fusion Centre in Singapore, endorsed under the ASEAN Defence Ministers' Meeting framework, as a critical regional reporting hub (Chan & Lim, 2026), arguing that the Centre can leverage its established voluntary shipping reporting network and dark ship tracking to bridge operational gaps among defence agencies, commercial cable owners, and repair operators, enabling rapid incident response from investigation to repair.

The literature on China presents a contrast between official industrial development reports and Western security assessments regarding deep-sea capabilities. The China Academy of Information and Communications Technology [CAICT] (2025, pp. 1-5, 12–15) emphasises technological advancements in ultra-long-distance transmission, space division multiplexing, international standardisation, and compliance with open cable standards. In contrast, security-focused studies document how Chinese civilian academic research vessels conduct loitering activities over vital cable routes to execute bathymetric surveying that may facilitate military operations in the future (Macias et al., 2026, pp. 1-3, 10–11). Furthermore, vulnerability assessments examine Beijing's military-civil fusion, pursuit of expanding clout in the deep sea, and dormant cable cutters, highlighting the economic and

operational risks posed to Trans-Pacific undersea infrastructure (Yeh et al., 2026, pp. 5-7, 10-16).

Although the scholarship reviewed above offers vital insights into the governance structures, vulnerabilities, and geopolitical tensions shaping submarine cable networks, far less attention has been paid to the underlying narratives framing these debates and the prospects for collaboration. This paper bridges that gap by analysing EU and Chinese strategic narratives on submarine infrastructure to pinpoint viable areas for cooperation.

3. Methodology and Sources

This study's analytical framework is built upon the concept of strategic narratives, which are the deliberate accounts political actors construct concerning the past, present, and projected future of international affairs. Leaders deploy these narratives as tools to exert influence, manage stakeholder expectations, and reshape policy debates in pursuit of their strategic goals (Miskimmon et al., 2013, p. 2).

Using this lens enables a systematic examination of the underlying storylines driving European Union and Chinese governance of submarine cable networks. Deconstructing these discourses illuminates the rationale behind current regulations and helps forecast upcoming policy shifts. More specifically, analysing the rhetorical foundations of both actors exposes critical friction points while simultaneously identifying areas where their interests might align for collaboration.

To operationalise this framework, the research adopts a method of structured, focused comparison (George & Bennett, 2005, pp. 3–36) across three distinct dimensions of undersea cable governance. To maintain consistency, each dimension is assessed using an identical set of analytical criteria: how the policy area is conceptualised, the core challenges it faces, and the respective strategic responses of the EU and China.

The empirical evidence is gathered from a wide array of primary and secondary materials, spanning government policy papers, news coverage, academic scholarship, and industry publications. The paper leverages texts in both English and Chinese to overcome a common language barrier that frequently limits comparative scholarship on this subject. A key

constraint of this study stems from the specialised, technical character of critical submarine infrastructure, which limits the volume of open-source data available for desk research.

4. Framing the Undersea Domains: What the EU and China See When They Look at Submarine Cable Networks

4.1. The European Union: From Commercial Integration to Defensive Resilience

Before 2022, the European Union treated subsea communications cables as commercial instruments of market integration and digital connectivity. During this time, telecommunications were not included on the list of European Critical Infrastructures, which instead focused mostly on energy and transport (Council Directive 2008/114/EC, 2008, Annex 1). Governance of subsea cable ecosystems was fragmented across national jurisdictions, based on their interpretation of Directive (EU) 2018/1972 (Body of European Regulators for Electronic Communications [BEREC], 2024, 17-20). Consequently, submarine cable initiatives were funded chiefly as regional connectivity projects designed to bridge digital divides and expand cross-border bandwidth capacity (Regulation (EU) 2021/1153, 2021, Art. 3, Art. 9(4)(d)).

Following 2022, the European Union fundamentally overhauled its submarine cable governance in favour of a security-based stance anchored in strategic autonomy and resilience. This structural transition reflects systemic global shocks, including pandemic-era supply chain failures that exposed the dangers of excessive reliance on foreign providers, as well as the heightened geopolitical instability following the Ukraine conflict. Anxiety over European critical infrastructure intensified following underwater incidents, most notably the Nord Stream explosions (Plucinska, 2022) and repeated subsea cable disruptions across the Baltic Sea (Kottasová et al., 2024). These events were later cited in EU regulatory texts (European Commission & High Representative of the Union for Foreign Affairs and Security Policy, 2023a, Section II; European Commission & High Representative of the Union for Foreign Affairs and Security Policy, 2025, Section 1) and underscored the acute vulnerability of maritime data corridors to potential hybrid warfare and sabotage, prompting European policymakers to reframe subsea cables from neutral commercial assets into critical nodes of national security.

This approach came to be pursued under the EU's agenda of 'economic security', which is in part operationalised by de-risking. Economic security refers to the European Union's proactive strategy to safeguard its economic resilience, technological edge, and strategic autonomy against systemic risks, including supply chain disruptions, critical infrastructure sabotage, technology leakage, and foreign economic coercion (European Commission & High Representative of the Union for Foreign Affairs and Security Policy, 2023b, Section 2). De-risking is the targeted policy mechanism used to minimise these vulnerabilities by identifying specific high-risk dependencies, enhancing domestic industrial competitiveness, diversifying supply chains, enforcing trade defence instruments, and preventing the leakage of sensitive dual-use technologies without resorting to total economic decoupling (von der Leyen, 2023).

Under this newer approach, submarine cable ecosystems are governed more directly. While past directives on 'electronic communications networks' did not discuss submarine cables explicitly (Directive 2002/19/EC, 2002; Directive 2002/21/EC, 2002; Directive (EU) 2018/1972, 2018), section 2 of the EU's Economic Security Strategy focuses on the 'risks to the physical and cyber-security of critical infrastructure', specifically citing 'undersea cables' as a vulnerability requiring dedicated mitigation.

The European Commission's 2024 Recommendation on Secure and Resilient Submarine Cable Infrastructures (Commission Recommendation (EU) 2024/779, 2024) notes that subsea cables carry the vast majority of international traffic and establishes that 'antagonistic man-made security threats' require EU-wide risk management. It also mandates a Union-wide risk assessment focusing on physical and cybersecurity (Commission Recommendation (EU) 2024/779, 2024, Section 3.1).

This momentum culminated in the 2025 EU Action Plan on Cable Security (European Commission & High Representative of the Union for Foreign Affairs and Security Policy, 2025) and the accompanying Submarine Cable Infrastructures Expert Group Reports (Submarine Cable Infrastructures informal Expert Group, 2025; Submarine Cable Infrastructures informal Expert Group, 2026). These initiatives operationalise a whole-of-government, full-resilience-cycle approach, spanning prevention, early detection, rapid response, and deterrence across both telecommunications and energy subsea

links (European Commission & High Representative of the Union for Foreign Affairs and Security Policy, 2025, Section 1). The new framework mandates comprehensive EU-wide threat mappings, consolidated risk assessments, and targeted emergency repair capabilities (Submarine Cable Infrastructures informal Expert Group, 2025, pp. 4-5; Submarine Cable Infrastructures informal Expert Group, 2026, p. 4). Central to this architecture are the Cable Security Toolbox, which establishes concrete risk-mitigation protocols, and the strategic designation of Cable Projects of European Interest (CPEIs) to direct public funding towards high-priority, resilient subsea routes (European Commission, 2026b). These developments signal a shift from reactive regulation to proactive critical infrastructure defence and hybrid-threat deterrence, treating submarine cables no longer as passive commercial conduits, but as vital, high-exposure strategic assets requiring coordinated state protection.

4.2. China: Tight Control and Vertical Integration

Beijing has historically integrated submarine optical cables into a unified, state-directed framework of industrial planning, digital sovereignty, and maritime power projection. The narrative surrounding submarine cables is rooted in the Cybersecurity Law of the People's Republic of China (2017), expanded in the Data Security Law (2021) and updated through the 2025 amendments to the Cybersecurity Law. Under the 2017 Cybersecurity Law, China established baseline state jurisdiction over physical networks defined as critical information infrastructure (Cybersecurity Law of the People's Republic of China, 2016, Arts. 1, 31). Regulations later operationalised this posture by designating communications facilities as Critical Information Infrastructure and mandating national security reviews for network equipment suppliers (Regulations on Security Protection of Critical Information Infrastructure, 2021, Arts. 2, 19). The Data Security Law of 2021 strengthened this posture by extending sovereign control from physical hardware to the information itself. It introduced a tiered classification regime for important and core data, explicitly asserting extraterritorial jurisdiction over cross-border data flows that affect national security (Data Security Law of the People's Republic of China, 2021, Arts. 1-2, 21, 31). The 2025 amendments to the Cybersecurity Law consolidated this statutory architecture by harmonising network safety obligations with data governance (Cybersecurity Law of the People's Republic of China, 2025, Arts. 3, 42), expanding extraterritorial enforcement and asset-freeze powers against foreign threats to national cybersecurity (Cybersecurity Law of

the People's Republic of China, 2025, Art. 77), and imposing strict supply-chain penalties on uncertified hardware in critical infrastructure (Cybersecurity Law of the People's Republic of China, 2025, Arts. 63, 66).

Submarine cables serve as the physical backbone for the Digital Silk Road, the digital component of the Belt and Road Initiative (National Development and Reform Commission, Ministry of Foreign Affairs, & Ministry of Commerce of the People's Republic of China, 2015, Section IV). While earlier industrial strategies targeted general digital connectivity, China's 15th Five-Year Plan explicitly inserts subsea optical networks into national infrastructure planning. In the plan, the state commits to enhancing backbone transmission capabilities and advancing international cooperation on submarine cable construction alongside next-generation network deployments (Outline of the 15th Five-Year Plan (2026–2030) for National Economic and Social Development of the People's Republic of China [15th Five-Year Plan], 2026, pp. 24-25).

Operationally, China’s policy approach toward subsea cables relies on vertical integration between state-owned telecommunications enterprises and domestic hardware manufacturers, as its regulations mandate that operators of critical information infrastructure purchase products of nationally trusted vendors (Regulations on Security Protection of Critical Information Infrastructure, 2021, Art. 19). Under state directive, subsea cables deployed along Digital Silk Road maritime corridors are treated as strategic conduits for national development, data security, and international cooperation with willing external counterparts.

4.3. The Evolution of EU-China Cooperation in Submarine Network Construction

The narratives and operational instruments deployed by each jurisdiction reflect their distinct geopolitical strategies. This operational divergence fundamentally altered the landscape of EU-China cooperation in digital infrastructure. Before the EU's securitisation pivot, subsea cable development between the two parties relied on commercial pragmatic interdependence.

European telecommunications operators historically maintained pragmatic commercial ties with Chinese state-owned enterprises (SOEs) and equipment manufacturers within

international consortiums. Major cross-continental cable systems, such as the 2Africa consortium, which brought together China Mobile International alongside European carriers including Orange and Vodafone (Submarine Cable Networks, n.d.-c; Qiu, 2025), as well as systems like SMW5 and AAE-1 co-owned by China Telecom, China Unicom, and European operators (Submarine Cable Networks, n.d.-b; Qiu, 2018), demonstrated productive cooperation between EU and Chinese entities.

Furthermore, Chinese vendors competed for deployment contracts linking Asian and European internet hubs. A prominent manifestation of this era was the Pakistan East Africa Cable Express (PEACE cable). Invested by China's Hengtong Group and constructed by HMN Tech (formerly Huawei Marine Networks), the Digital Silk Road asset chose Marseille, France, as its primary European landing point, relying on Orange S.A. as its technical landing partner and hosting facility provider (Submarine Cable Networks, n.d.-a; PEACE Cable International, n.d.; Qiu, 2024; Orange, PCCW Global, & PEACE Cable International, 2021), while European regional incumbents such as Cyta (Cyprus) and GO (Malta) integrated custom branch subsystems directly into the PEACE trunk (TeleGeography, n.d.).

However, this co-development framework came under pressure due to rising geopolitical frictions and European policy alignment with broader transatlantic security priorities. This is demonstrated by the bidding war for the 19,200 km South East Asia–Middle East–Western Europe 6 (SMW6) cable connecting Singapore to Marseille. Although Chinese supplier HMN Tech originally won the commercial tender in 2020 with a $475 million bid, intense US diplomatic pressure, citing high-risk vendor concerns and sanctions, forced the consortium, which included the European incumbent Orange, to reassign the contract to US-based SubCom in 2022 (Brock, 2023a). In response to the contract exclusion, China Mobile and China Telecom withdrew their combined 20% equity stake from the SMW6 project and commissioned a parallel, structurally decoupled infrastructure initiative: the Europe-Middle East-Asia (EMA) cable system, manufactured by HMN Tech (Gross & Heal, 2023; Brock, 2023b). While European stakeholders were reported to be involved in the EMA project as well, the completion of the cable has not been widely reported.

In this context of significant shifts in narratives, policy tools, and projects surrounding submarine cables, it is imperative to take stock of the various policy areas involving

undersea cable governance in an effort to identify potential avenues of cooperation between Brussels and Beijing in this field.

5. Policy Domains and EU-China Cooperation Prospects

5.1. Cable Deployment

The global market for submarine cable manufacturing and deployment is highly concentrated. Fabrication capabilities for critical deep-sea wet-plant equipment are mostly possessed by four dominant international suppliers: Alcatel Submarine Networks (France), SubCom (United States), Nippon Electric Company (Japan), and HMN Technologies (China) (Koshino, 2024, p. 2; Fortune Business Insights, 2026). This market concentration limits sovereigns' ability to unilaterally construct insular or entirely localised supply chains, forcing international actors to accept structural foreign interdependencies for transcontinental deployments (Submarine Cable Infrastructures Informal Expert Group, 2025, p. 6). This leads to embedded liabilities. Cable operators deploy remote network management system utilities that interact with reconfigurable optical add-drop multiplexers to preserve signal strength and optimise transmission over thousands of kilometres. These management utilities often run on common, non-air-gapped operating systems for cost-efficiency, thereby introducing privileged software access points (Agarwal, 2023, pp. 2-8), enabling remote traffic disruption or espionage (Sherman, 2021a, pp. 2, 17-20).

Therefore, there is a significant element of strategic trust embedded in intercontinental undersea cable projects: one needs to collaborate with reliable vendors to make sure that sensitive data remains secure. The European Union model for mitigating this liability reflects a hybrid approach that balances open-market elements with increasingly defensive regulatory measures. When executing cable deployments, project entities in the EU navigate an administrative landscape overseen by individual member states, making them subject to standard domestic maritime, environmental, and other criteria (Submarine Cable Infrastructures informal Expert Group, 2026, p. 8; Submarine Cable Infrastructures informal Expert Group, 2025, p. 12). The EU has been increasingly overlaying these commercial steps with centralised security screening, calling for supply-chain audits, physical vulnerability assessments at landing stations, and the exclusion of high-risk

vendors from key physical infrastructure nodes (European Commission & High Representative of the Union for Foreign Affairs and Security Policy, 2025, Section 2.1; Submarine Cable Infrastructures Informal Expert Group, 2026, pp. 9-12).

These screens are complemented by recommendations for detailed personnel vetting requirements alongside defending against physical intrusion at land-based network operation centers and coastal beach manholes (Submarine Cable Infrastructures Informal Expert Group, 2026, pp. 19-20). To counteract the financial friction caused by restricting access to lower-cost international equipment providers, Europe utilises these financial instruments under the Connecting Europe Facility to subsidise projects and enhance the resilience of local supply chains (European Commission, 2023, p. 59).

China's operational approach to landing rights and international deployment is characterised by a model of state-integrated infrastructure development and centralised risk management. Within its domestic jurisdiction, it implements unified technical standards and clear domestic management mandates for cross-border connections (Regulations on Security Protection of Critical Information Infrastructure, 2021, Arts. 12, 14 & 19; Interim Provisions on the Administration of International Networking of Computer Information Networks of the People's Republic of China, 2024, Arts. 6-7). Under this framework, international data transmission infrastructure must interface directly with networks operated by authorised domestic telecommunications enterprises (Interim Provisions on the Administration of International Networking of Computer Information Networks of the People's Republic of China, 2024, Arts. 6-7). Furthermore, the physical nodes housing these networks are designated as critical information infrastructure, legally restricting operational management to authorised domestic telecommunications enterprises and subjecting the technology supply chain to national security reviews (Regulations on Security Protection of Critical Information Infrastructure, 2021, Arts. 12 & 19). This regulatory structure strives to ensure that cross-border data routing remains subject to domestic digital management protocols while insulating core domestic networks from external structural vulnerabilities or unauthorised disruption. At the operational level, this manifests in a state-driven top-down approach that differs from the predominantly decentralised, market-driven process of Western cable projects mostly owned by private

hyperscalers such as Amazon, Meta, Microsoft, or Google (Carter et al., 2023, p. 11; Weissberger, 2026).

China's overseas subsea cable projects are grounded in agreements between governments, state-backed concessional loans, and state-backed enterprises. The Digital Silk Road, an extension of China's Belt and Road Initiative formalised in 2017 at the first Belt and Road Summit, serves as an alignment framework that encompasses bilateral memoranda of understanding on digital cooperation with at least 17 partner states, alongside the establishment of dedicated "Silk Road E-commerce" mechanisms across at least 23 jurisdictions. This institutional scaffolding is reinforced by substantial hardware investments that include several international submarine cables (Fu, 2024; Lin, 2022). In 2021, Chinese state-owned companies like China Telecom, China Unicom, and China Mobile secured equity stakes in twelve, eleven, and eight systems, respectively, that entered active service. This momentum was sustained into subsequent deployment cycles, as all three major state operators committed further capital to upcoming infrastructure pipelines, strengthening their long-term ownership footprint across the international subsea network grid (Sherman, 2021b).

These two models leave little room for deep operational integration or joint projects, as both the EU and China both pursue cooperation with trusted partners, and those partners rarely overlap. Prospects of deep technical cooperation within shared consortia or landing stations appear slim for the foreseeable future because Europe seeks to isolate and swap out vendors it does not trust to protect its hardware integrity, while China also cautiously guards its undersea digital networks. This structural friction is likely to mirror the broader historical trend, where consortia with US involvement strive to bypass China and Chinese vendors while Chinese state enterprises withdraw capital from Trans-Pacific networks to build isolated alternatives (Teng-Westergaard, 2026; Vuong & Chi, 2025, 570; Hwang & Yang, 2026, 6; Brock, 2023b).

5.2. Cable Repairs

Subsea infrastructure exists in a state of permanent vulnerability. The threat is not necessarily a deliberate act of war. Over 70% of all the 150-200 global submarine cable

faults are caused by routine, accidental human activity, primarily commercial fishing trawlers dragging heavy nets along the seabed and cargo ships dragging anchors outside designated zones (International Cable Protection Committee [ICPC], 2026). Furthermore, submarine fibre-optic cables are exposed to constant physical hazards from both environmental forces and commercial marine activities, requiring constant operational readiness for the timely mitigation of economic and strategic disruptions (International Advisory Body on Submarine Cable Resilience [IAB], 2026, pp. X, 9).

In this context, the operational sustainability of subsea digital networks depends on a highly specialised maritime logistics sector: the global cable repair fleet. When a submarine cable experiences a physical fault, restoring it requires deploying specialised cable ships, high-performance remotely operated vehicles, and grapnels, among other highly specific equipment (KIS-ORCA n.d.; Submarine Telecoms Forum, n.d.). Since the global economy routes most of transcontinental internet data through these deep-sea conduits, any prolonged delay in mobilising these specialised vessels directly translates into compounding financial losses for affected regions (Subsea Cables, 2025). Therefore, the maritime repair industry functions as the critical linchpin of global digital resilience.

A key vulnerability in subsea maintenance logistics is the scarcity of commercial cable-repair vessels. The global fleet consists of roughly sixty specialized ships tasked with maintaining more than five hundred cable systems spanning over one million kilometers of seabed (Constable et al., 2025, pp. 30, 55). This structural deficit creates operational friction, as often only a small number of vessels are responsible for covering massive maritime zones like those around Africa or Japan (Constable et al., 2025, pp. 59-60). Furthermore, the administrative and regulatory hurdles of international law of the sea often delay operations, frequently eclipsing the actual technical repair time. Vessels must obtain formal permits to conduct repairs within a sovereign state's continental shelf or territorial waters (IAB, 2026, pp. 13-14, 21; Mauldin, 2026). In geopolitically contested maritime environments, states can leverage these bureaucratic permit processes to delay or deny access to repair fleets, leaving critical international infrastructure disabled for extended periods (MI News Network, 2024). Without standardised international cooperation, a single regulatory bottleneck can paralyse regional connectivity (Alvez Tomaz & Voo, 2024; Insikt Group, 2025, p. 8).

The EU has responded to this global vessel shortage by establishing a decentralised public emergency response system. In 2026, recognising the vulnerability of the European region's sea basins to coordinated physical infrastructure disruptions, the European Commission amended its Connecting Europe Facility Digital work programme to finance critical undersea cable projects, including the enhancement of repair capacities (European Commission, 2026b). Within this strategy, there is a targeted sixty million euro allocation dedicated to developing and deploying adaptable repair modules to be hosted in ports or shipyards (European Health and Digital Executive Agency [HaDEA], 2026a; HaDEA, 2026b). Instead of building expensive ships dedicated to cable repairs, this funding supports public entities with emergency response mandates to pre-configure standard, flat-deck civilian and public vessels to host modular repair kits (European Commission, 2026c). These modular kits include portable cable-handling systems, jointing tools, and specialized remotely operated vehicles that can be rapidly mobilised within seventy-two hours from regional port hubs (European Commission, 2026a, pp. 7-8), bypassing commercial fleet bottlenecks during declared emergencies. The initial pilot focused on the Baltic Sea region because of the high frequency of critical infrastructure incidents recorded across adjacent waters and later was extended to cover the Mediterranean and Atlantic basins, including EU Outermost Regions (HaDEA, 2026a; HaDEA, 2026b).

To enhance the resilience of its submarine cable ecosystem and its repair capacities, Beijing doubles down on self-sufficiency and relies on Chinese enterprises that deliver high-standard undersea cable-related services. Chinese enterprises like SBSS and FiberHome have long been maintaining and constructing international submarine cables. SBSS has provided maintenance in the Northwest Pacific's Yokohama Maintenance Area for over 27 years, repairing over 80,000 kilometres of cables across more than 200 emergency operations (CAICT, 2025, pp. 14-15). In 2021, China Southern Power Grid Extra High Voltage Transmission Company executed China's first repair using fallpipe rock-dumping technology, a method previously held only by foreign companies, to protect the 500-kilovolt Fuxu Jia Line, a critical underwater line of Hainan Island in Southern China (Li, 2021). By 2025, Chinese firms have captured a massive share of the global cable market, disrupting the historical dominance of Alcatel Submarine Networks, SubCom, and NEC. Led by Hengtong (ranking 2nd globally) and Zhongtian Technology (4th), Chinese

manufacturers have evolved from basic suppliers into full system integrators (5G通信 [5G Communications], 2025). These Chinese enterprises dominate the domestic subsea cable market and are bound by strict Chinese regulations, making sure that external dependencies are minimised and most of the undersea cable-related services are provided by reliable domestic entities. Furthermore, Beijing also maintains strict cabotage regulations that heavily favor its own domestic ships and crews for subsea cable deployment and maintenance. (Yee, 2023; Provisions Governing the Laying of Submarine Cables and Pipelines, 1989, Art. 10). In this approach to maintenance and repair, reliable enterprises maintain direct ownership and operational control over a domestic fleet of cable ships, ensuring that all physical maintenance and component replacements on state-aligned routes are executed by vetted domestic crews.

The digital infrastructure linking Western Europe to East Asia is a web of shared capacity. When a stray anchor hooks a transcontinental cable in a vital maritime chokepoint, the economic shockwaves are rapid and symmetrical. Although China and Europe sit on opposite sides of these cables, they both use them to connect to, and trade with, the rest of the world (CAICT, 2018, pp. 10-14; Monaco, 2025; Besch & Brown, 2024, p. 3), and an outage impacts them equally, regardless of their respective capabilities in this realm. Since routine fishing and shipping accidents are almost inevitable, both Brussels and Beijing share a fundamental incentive to insulate undersea cable repair from geopolitics and to treat it as a neutral utility. In other words, the space for pragmatic diplomacy exists to establish emergency procedures which ensure that authorised repair ships can enter affected areas safely and swiftly, and that both actors can prevent a routine maritime accident from spiralling into a long-term disruption to global digital connectivity. Multilateral frameworks, such as the recently initiated ‘Guiding Principles for Underwater Infrastructure Defence Exchanges’ (GUIDE) (Qiu, 2026), could provide a ‘low-risk’ setting where the two sides can join partners and make gradual progress on this front via confidence-building measures.

5.3. Subsea Data Sharing

Science Monitoring and Reliable Telecommunications (SMART) subsea cables combine commercial telecommunications with deep-ocean environmental observation by embedding

scientific sensors directly into submerged network repeaters (Howe et al., 2022, pp. 2, 11-12). Historically, deep-ocean data collection has been characterised by high operating costs of independent scientific buoys and maritime research vessels (Williams et al., 2025, pp. 2-3). SMART technology enables continuous, real-time tracking of ocean temperatures, seismic activity, and pressure fluctuations by building on the power and data-transmission infrastructure of commercial fiber-optic networks (Howe et al., 2022, pp. 2, 12-14). This integration adds new functionality to undersea cables, turning them into seafloor-based observatories that collect climate-quality data and provide early warnings for tsunamis and earthquakes (Howe et al., 2022, pp. 4-11).

Concurrently, the possible dual-use nature of these advanced acoustic and pressure sensors introduces a complex dynamic where ecological utility intersects with national security. Ocean bottom pressure sensors and hydroacoustic tools can be used to detect seismic anomalies, but they can also record acoustic signatures and transit movements of maritime vessels ("Europeans Wade Into Fighting Seabed Threats, 2023; Voosen, 2024; Qiu, 2020; Prysmian, n.d.). Consequently, the data generated by these assets may become contested.

The European Union addresses the intersection of environmental observation and subsea security by including SMART cable adoption in its centralised funding mechanisms (European Commission, 2026). This strategy is driven by a desire to combine climate change research with enhanced infrastructure monitoring functionalities (European Commission, 2026b). To operationalise this approach, the European Health and Digital Executive Agency launched a dedicated twenty million euro initiative under the Connecting Europe Facility Digital framework specifically targeting equipment for smart European cable systems. This funding is aimed at integrating advanced sensors measuring temperatures and detecting acoustic or seismic signals directly into existing European submarine telecommunications infrastructure (European Commission, 2026d). The European Commission seeks to maintain regulatory control over both the physical hardware and the resulting data streams by directly financing these upgrades and imposing strict eligibility requirements to use the services of trusted suppliers. This mechanism allows Europe to leverage the ecological benefits of ocean observing systems while shielding its maritime domain from foreign intelligence exploitation.

China's 14th Five-Year Plan prioritised deep-sea exploration and key core technologies as national security imperatives (Outline of the 14th Five-Year Plan (2021–2025) for National Economic and Social Development and Vision 2035 of the People's Republic of China, [14th Five-Year Plan], 2021, pp. 12-13). Building on this framework, the 15th Five-Year Plan doubles down on deep-sea engineering projects to enhance national capabilities in entering, detecting, and securing subsea and seabed environments (15th Five-Year Plan, 2026, pp. 74-75). These guidelines are operationalised through initiatives like "Transparent Ocean," led by institutions such as the Ocean University of China. Through the initiative's sub-projects that involve seabed observation technologies, smart buoys, and deep-sea observation networks, China links undersea infrastructure into a multi-layered "Ocean Internet of Things" designed to secure real-time telemetry across strategic sea basins (Li et al., 2019, pp. 130, 133-135).

Some elements of the Transparent Ocean initiative are linked to national security and maritime domain awareness (Li et al., 2019, pp. 134-135). Under the Transparent Ocean roadmap, cabled and surface nodes deliver real-time data for climate research while simultaneously tracking maritime targets and feeding decision-making systems (Li et al., 2019, pp. 135). While systems like the "Bailong" deep-sea climate buoy continuously observe environmental data across Maritime Silk Road routes, space-based observation links like the "Guanlan" satellite collect subsurface profile data down to 500 meters depth, which entails a dual-use capability for detecting submerged submarines (Shen et al., 2025). Therefore, China's approach to this domain mirrors its broader subsea strategy, relying on trusted domestic research institutions to enhance its underwater surveillance capabilities.

The dual-use risks associated with underwater acoustic and pressure data significantly restrict the possibility for direct, bilateral sensor data sharing between the European Union and China. However, the path for cooperation remains open through sharing highly aggregated, low-resolution climate statistics channeled through neutral multilateral organisations. Such an organisation is the Joint Task Force on SMART Cable Systems, which brings together the International Telecommunication Union, the World Meteorological Organization, and the Intergovernmental Oceanographic Commission of UNESCO (ITU, n.d.). In this multilateral environment, both powers could explore the possibility of sharing non-sensitive environmental data for oceanography and early

tsunami detection, among other purposes, while following their own data policies (Howe et al., 2022, p. 22; Howe et al., 2019, pp. 17-18). By limiting interaction to domains where both sides have sufficient trust, the EU and China can contribute to the international community's effort to maintain critical global environmental monitoring pathways while respecting each other's national security boundaries and sensitivities.

6. Conclusion

Submarine cables serve as the critical physical conduits of international connectivity, inherently requiring cross-border interdependence. However, their strategic sensitivity has subjected subsea governance to intense securitisation. While the European Union has pivoted toward defensive de-risking and trusted vendor networks, China pursues state-directed vertical integration and sovereign infrastructure control. This structural divergence severely constrains bilateral cooperation, though the degree of friction varies across specific policy domains.

In cable deployment and manufacturing, joint initiatives remain highly unlikely due to an acute deficit of strategic trust and incompatible supply-chain security mandates. Conversely, narrow windows of functional necessity persist where mutual interests align. Regarding subsea cable repairs, the global shortage of specialized vessels and the symmetrical economic fallout of accidental disruptions create space for pragmatic diplomacy. Establishing expedited clearance protocols under international law of the sea would allow authorized repair ships to access contested waters swiftly, preventing routine maritime accidents from escalating into prolonged global connectivity outages. Similarly, in the domain of SMART cables, dual-use security concerns preclude raw telemetry sharing, yet cooperation remains viable through channeling aggregated, low-resolution climate data via neutral multilateral bodies.

Mapping these operational boundaries is merely the preliminary step. Future research must rigorously evaluate the political and technical feasibility of institutionalising these narrow cooperative pathways. Specifically, scholars and policymakers should examine low-risk confidence-building measures, such as standardised emergency de-confliction frameworks or joint technical standards for modular repair assets, as functional mechanisms to reduce

mutual misunderstandings and incrementally build strategic trust. Targeted technical cooperation in areas of shared operational challenges could help narrow the gap between Brussels' and Beijing's diverging security narratives, insulating critical global infrastructure from the negative effects of geopolitical frictions.

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