The Upcoming Digital Arctic: Data Transportation, Storage, Analysis and Production

Michael Delaunay

In recent years, there have been several suspicious and accidental cuts to fibre-optic submarine cables. This infrastructure has therefore become a strategic asset and is the subject of a securitization process. The Arctic is increasingly being considered as an alternative to traditional cable routes passing through the bottleneck of the Red Sea, through which most of the data currently exchanged between Europe and Asia flows. In search of a resilient, redundant and secure network to strengthen its digital sovereignty, the European Union is supporting two trans-Arctic submarine cable projects. These projects will connect Europe and Asia via the Arctic for the first time, while enabling scientific research through the addition of SMART and DAS sensors. These sensors have dual capabilities, serving both climate change research in the Arctic and providing sensitive military intelligence. Submarine cables are not the only infrastructure with potential in the Arctic. As is already the case in Iceland and the Nordic countries, developing this infrastructure in the Arctic could attract data centers, particularly those dedicated to AI. These data centers prioritize access to green, lower-cost energy and cool air for their server rooms over locating closer to their users, driven by a new trend that favors power over latency. Thanks to these two trends, the Arctic could become better connected, transitioning from merely consuming data to producing it, and becoming capable of storing and analyzing it in AI-dedicated data centers. This could strengthen the digital sovereignty of Arctic countries and make them all the more strategically important in an ultra-connected world that depends on digital data.

Introduction

Although the Arctic offers advantages to the digital sector, these have not yet been enough to encourage the development of major infrastructure, such as submarine fibre-optic cables and data centers. Despite that, both types of infrastructure are already present throughout the region, particularly in Iceland and the Nordic countries. However, two recent international developments have brought the Arctic into focus as an increasingly attractive region for tech industry players and certain governments.

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Firstly, war has returned to Europe with Russia's invasion of Ukraine and to the Middle East. In this context, threats to and disruptions of submarine cables have increased in recent years. These factors are prompting nations to seek ways to secure their data transmission routes. Submarine cables of fiber-optic have thus once again become strategic assets in the eyes of governments, given the threats and disruptions to cables in the Baltic Sea, the Red Sea, and the Arctic. This has prompted governments to strengthen the security of their networks and reinforce their digital sovereignty. Consequently, some stakeholders are planning to lay submarine cables through the Arctic to connect Europe to Asia in search of new, more secure and redundant routes.

The region offers a faster and more stable alternative to the traditional route between Europe and Asia via the Red Sea. It also enables the deployment of SMART[1] sensors and DAS[2] technology. Scientists intend to use these technologies to study the effects of climate change on the Arctic Ocean. Furthermore, the dual-use nature of these technologies is of interest to the defence sector, as they can enhance maritime situational awareness by detecting ships and submarines in this strategic region. Although attempts to build trans-Arctic cable projects have been unsuccessful for over 26 years due to a lack of support from private and public investors, interest in this route has recently increased. The EU views this region as a means of securing and increasing the redundancy of its data transmission routes to Asia, as well as strengthening its digital sovereignty.

Another major trend in the digital sector is the race for Artificial Intelligence (AI) and the substantial investment being poured into this area. The huge demand for energy, land and water, coupled with substantial investment in AI development, is transforming the data center sector — a change that is having an impact as far afield as the Arctic. Consequently, the Arctic is becoming an appealing prospect for the AI data center sector, which urgently needs accessible energy — a resource certain Arctic, sub-arctic regions and Nordic countries possess in abundance, particularly in the form of green energy, such as hydroelectric power — as well as land situated away from protests against the development of these mega data centers. The Arctic also offers an abundance of fresh air and water, which can be used to cool server rooms more efficiently.

Against the backdrop of a trend towards the securitization of submarine cables and AI data centers and states' desire to strengthen their digital sovereignty, one might ask whether the traditional lag of the Arctic in terms of transport, storage, data production and analysis could be offset by the joint development of digital infrastructure, such as subsea cables and AI data centers, in the Arctic and Nordic countries, establishing these regions as a major new hub for data transport, storage and analysis. Or, given its limitations, will the Arctic remain on the periphery of digital development for Europe and other stakeholders in the sector?

To answer this question, we will analyze the development of connectivity via submarine cables of fiber-optic in the Arctic, as well as the security and digital sovereignty issues that have prompted parties such as the EU to establish the Arctic as a new strategic route for European data flowing to Asia. Then, we will examine the growth of the data center sector in the region, paying particular attention to AI-dedicated data centers.

[1] Science Monitoring And Reliable Telecommunications (SMART)
[2] Distributed Acoustic Sensing (DAS)

Transmitting and Collecting Data in the Arctic: Submarine and "smart" Cables

Submarine cable connectivity in the Arctic

An Overview of Trans-Arctic Cable Projects

Historically, the development of submarine cables of fiber-optic has benefited the Arctic little due to higher costs, a shorter construction window (only during the summer), and a small local customer base, while the region's extreme weather conditions also pose challenges. Making those projects unprofitable for private companies. For these reasons, even today, many regions are still reliant on satellite technology, whether geostationary (GEO) or, increasingly, low Earth orbit (LEO). However, since the early 2000s, major trans-Arctic cable projects, as well as local ones, have been announced. In 2014, at the height of the boom in announced trans-Arctic cable projects, we published a briefing note on the subject in this journal, analyzing the ROTACS, Arctic Fibre and Ivaluk Network cable projects (Delaunay, 2014). In that article, we wrote that "In the coming years, with the melting of the polar ice and thanks to Canadian and Russian projects, Arctic residents may soon be linked to the global network and thus benefit from high-speed Internet connections" (Delaunay, 2014, p. 1), while acknowledging the challenges these projects faced. Although the number of submarine cables of fiber-optic laid worldwide has increased from 300 to 600 over the past 12 years (Burdette, 2025), the Arctic still lacks trans-Arctic cables crossing it entirely, whether via the Northeast or Northwest Passages.

The list of failed trans-Arctic and local cable projects is long (Delaunay, 2025a). These failures stem from the fact that, although some projects received government support, they were limited. At the time, connecting these regions via cable was considered too expensive, whereas GEO satellites made it possible to connect the Arctic at a lower cost (and speed) in the short term. Furthermore, all of these projects were led by private companies that were unable to raise the necessary funds by attracting investors wary of risky projects with uncertain returns on investment.

The Current Status of Arctic Connectivity

Since 2014, the expansion of local and trans-Arctic submarine cable of fiber-optic projects, supported by the region's countries, has significantly improved connectivity for the involved communities. Connectivity in the Arctic has generally improved with the implementation of public funding policies that support the development of terrestrial, submarine and space-based networks, the impact of which is primarily local (Delaunay, 2025b). The development of the undersea cable network in the Arctic is primarily driven by governments in Alaska, Canada, Russia and the Nordic countries. Indeed, no submarine cable of fiber-optic project in the region has materialized without full or partial support from the public sector, whether direct or indirect (Delaunay, 2025a).

Although the introduction of LEO satellite connectivity via Starlink in late 2022 (Cohen, 2022) and then OneWeb, in the Arctic, has clearly improved connectivity and the daily lives of residents in the region (Kunze, 2024; Zachariah, 2023), it cannot fully meet local or intercontinental data needs due to its limited capacity compared to submarine cables of fiber-optic, while raising concerns about control of infrastructure and digital sovereignty, as in Canada, for example. For these reasons, efforts to build trans-Arctic cable projects are ongoing.

Several major cable projects have been announced in recent years as a result. The first of these is the Polar Express trans-Arctic cable project, which is set to connect the entire Russian Arctic, from Teribërka to Vladivostok. This project involves the laying of a 12,650 km cable, financed and implemented by companies owned by the Russian federal government. The first section of the cable, connecting Teribërka and Amderma, was laid by the Russian company Upravleniye Perspektivnykh Tekhnologiy (UPT) in October 2022 (ComNews, 2025). In North America, the Far North Fiber cable project, initiated by Far North Digital (Alaska), is currently under development. This trans-Arctic cable will span 17,000 km and is intended to connect Europe, Canada, Alaska and Japan via the Northwest Passage (NWP). In Europe, the Polar Connect transpolar cable project is being developed by the Nordic research network NORDUnet and the Swedish Polar Research Secretariat. This 10,000 km cable is expected to run west of the North Geographic Pole, connecting Europe and Asia (NORDUnet, 2024).

But these projects need solid financial backing and strong political support to succeed, which has not necessarily been the case until now. However, the evolving international security landscape seems to be creating opportunities for cable projects in the Arctic.

The Changing Security Landscape is Spilling into the Arctic

Cables Have Once Again Become a Strategic Asset for Governments

The Securitization of Submarine Cables and the Quest for Digital Sovereignty

Since 2015, when the media began reporting on the surveillance of submarine cables of fiber-optic by Russian ships, notably the Yantar, the issue of cable protection and vulnerability has gradually returned to public discourse. However, it was only after Russia's invasion of Ukraine and subsequent threats against European cables in retaliation for sanctions imposed on Russia (Carassio & Patou, 2022) that the issue truly became central to the debate again. This forced governments to seek ways to secure their critical undersea infrastructure, including submarine cables of fiber-optic. Attacks on the Nord Stream 1 and 2 pipelines in 2022, and suspicious cable cuts in the Baltic Sea from 2023 onwards (AFP, 2023; Wright, 2023; Besch and Brown, 2024; Reuters, 2024; Lott, 2024), as well as in the Arctic near Svalbard (Nagelhus Schia, Gjesvik, and Rødningen, 2023), have drawn significant attention to this issue and emphasized the urgent need to protect this infrastructure from damage, whether intentional or not. Furthermore, the severing of three major cables in the Red Sea in 2024 (Belson, 2024), which disrupted traffic between Europe and Asia (Wooden, 2024), and recent Iranian threats against submarine cables (Primrose Jones, 2026) have further emphasized the need to protect submarine cables and find alternative data routes.

Following this series of events, submarine cables became subject to an increasingly pronounced process of securitization by states. Once again, as had been the case since the telegraph era, states came to regard this infrastructure as vulnerable and strategic to national interests, and therefore in need of protection. The Copenhagen School theorized the concept of securitization, defining it as a process that elevates a fundamental security issue to the level of state policy. This is a threat that has become existential to the state and previously fell solely within the realm of everyday life. It therefore necessitates exceptional measures to preserve state security, making it a political choice rather than a process that is de facto imposed on society. Furthermore, these measures may strengthen digital sovereignty, defined as the degree of control and independence an entity, such as a state, can exercise over digital technologies. A country's digital sovereignty is measured by how

dependent it is on the technology of a particular private and/or foreign actor. Pursuing a certain degree of technological independence — and thus greater control over digital solutions and infrastructure — has become a key challenge for states. The digital sector, which encompasses submarine cables and data centers, is therefore also subject to a process of securitization. Pursuing digital sovereignty means reducing dependence on other actors, and this encompasses the entire digital sphere, from infrastructure to software. In the competitive and security context of the international stage, it has thus become imperative for states to retain control over this sector and exercise sovereign authority in the digital domain.

It is no surprise then that now security concerns and the pursuit of greater digital sovereignty appear to lie at the heart of government efforts to develop cable networks and establish data centers, as far as the Arctic. Since the onset of the pandemic and, more recently, the war in Ukraine and the resurgence of power dynamics between major and middle powers, states have come to regard the digital infrastructure underpinning the transmission, storage, and analysis of data (with the advent of AI) as strategic and vital to modern, hyper-connected societies that have become dependent on data and access to it.

The European Union's tools for strengthening its digital sovereignty

The European Union is one of the actors participating in the securitization process of submarine cables and is seeking greater digital sovereignty. To support this, the European Union established the Connecting Europe Facility (CEF) in 2021, which includes a digital component centered on telecommunications infrastructure. This component is designed to finance projects that benefit the European network. To date, it has allocated €420 million to 51 submarine cable projects designed to diversify and secure European data routes (European Commission, 2024). The funding is based on a clear vision that establishes priorities according to the 2025 Report on the Security and Resilience of EU Submarine Cable Infrastructures (European Commission, 2025b), the European Union's digital strategy (European Commission, 2025a), and the definition of Cable Projects of European Interest (CPEI) in the Security Toolbox (European Commission, 2026).

The EU is addressing these issues by expanding its network and bolstering its digital sovereignty to safeguard data transmission between Europe and its international partners. The Arctic is one of the avenues for achieving this.

The Arctic is expanding its cable network thanks to Europe and the quest for sovereignty.

The future of European digital sovereignty depends on the Arctic

In this context, the Arctic is emerging as a credible alternative that is gaining traction among certain actors, particularly the EU. Indeed, the European Union's digital strategy states that "Arctic connectivity is a strategic priority for the EU" (European Commission, 2026a). Furthermore, the *West Arctic Passage and the Polar Passage* have been designated as the second region for Cable Projects of European Interest (CPEI). Finally, a report commissioned by the EU and published in January 2025 emphasizes the advantages of establishing a connection between Europe and Japan via the North American Arctic (Saunavaara, 2025). Driven by an increasingly tense international climate and potential or actual submarine cable disruptions affecting its communication with international partners, the EU is seeking new alternatives and regards the Arctic as a credible option.



Figure 1. Map showing the proposed Arctic routes for the second EU cable priority area (European Commission, 2026, p.35, citing Analyses Mason, 2026)

Arctic cable projects funded by the European Union

Arctic cable projects serving European interests are then supported in every funding round of the digital component of the CEF. The EU presents the Arctic as its future data route, which represents a paradigm shift in the development of submarine cables in the region. For the past 26 years, trans-Arctic cable projects have been initiated by private companies, which have primarily sought to finance their projects through private markets, while also requesting support from governments, with limited success. Once again, both private and public projects are being launched today. However, the quest for digital sovereignty and the securitization of submarine cables is prompting governments — notably the European Union — to provide cable projects in the region with unprecedented political and financial support. These projects are driven by concerns about digital sovereignty and network resilience, two elements that were lacking in previous projects which ultimately failed.

Then the European Union is supporting the Polar Connect transpolar cable project; the Far North Fiber transarctic cable project; and the Tusass Connect regional cable network with a transarctic focus. Polar Connect, which is expected to run close to the North Pole, has now received €10.8 million in funding from the EU. The Far North Fiber project, which aims to connect Europe to Asia via the Northwest Passage, has already received over €38 million in funding from the EU's CEF Digital program. In 2025, the European Union announced the allocation of 34 million euros in funding to the Greenlandic state-owned company Tusass, under the CEF, for the Tusass Connect cable project, which is intended to connect Qaqortoq and Aasiaat (European Commission, 2025b; Tusass, 2025b). Tusass thus received a total of nearly 55 million euros for the development of its network from the EU. Furthermore, amid a severely deteriorating security situation due to threats from the Trump administration toward the island, the latest Danish defence bill included funding of $468 million for a new cable connecting Denmark to Greenland. (Thorsson, 2025). This proves once again that the securitization of submarine cables and the need

to strengthen digital sovereignty are issues affecting an increasing number of countries, even in the Arctic region.

Norway and Russia: sovereignty at stakes

It does not stop here. In 2025, Norway agreed to invest €240 million through Space Norway in the Arctic Way cable project, which will connect Longyearbyen in the Svalbard archipelago to Bodø in Norway. The cable will also provide a connection to Jan Mayen Island, where the Norwegian Armed Forces are expanding their facilities (Staalesen, 2024). The primary objective is to connect Space Norway's SvalSat data reception station, the largest in the world, establishing the cable as a vital piece of infrastructure for Norway.

Russia also views the Arctic as a strategic priority in terms of connectivity. Following repeated setbacks to previous Russian transarctic cable projects, the Russian federal government decided in 2020 to finance the Polar Express cable project entirely through public funds via Russian state-owned companies. The development of the Arctic regions and the Northern Sea Route is vital to the Russian federal government, especially for the resource extraction sector.

As a result, and on this scale for the first time, governments are providing political and financial support for cable projects in the Arctic. This is in an effort to strengthen their territorial and digital sovereignty by enabling projects that the private sector had previously been unable to realize. The unwavering support of governments, particularly the European Union, for these trans-Arctic cable projects represents a true paradigm shift. Driven by the dual objectives of achieving digital sovereignty and enhancing the security of submarine cables, states now regard this vital infrastructure as both strategic and vulnerable. They are therefore seeking to protect and control it whilst also exploring new, more secure routes for transmitting data. However, will this be enough to ensure the completion of these projects, which face significant challenges? For now, the question remains unanswered.

Generate data

These cables will transmit data from Europe to Asia and feed scientific and potentially military databases. This will be made possible by sensors integrated via the announced SMART and/or DAS technologies, which are set to be deployed in the Arctic.

SMART and DAS sensors

Sensors for Detecting Tsunamis

The concept of science monitoring and reliable telecommunications (SMART) cables has existed for several decades, albeit on a small scale. It was initially deployed on decommissioned and reused cables off the coast of Japan in the 1990s to facilitate earthquake and tsunami detection (Howe et al., 2019). It was equipped with accelerometers, pressure sensors and thermometers. These three variables are primarily measured by SMART cables for the benefit of scientific research. Since 2012, researchers within the JTF SMART project[3], supported by three UN agencies, have been advancing this technology by adding SMART sensors to not only decommissioned telecommunications cables, but also repeaters on active ones. The goal is to create a low-cost, easy-to-implement global real-time ocean observation system for studying climate change (Howe et al., 2019).

[3] https://www.smartcables.org/jtf

The second technology, which like SMART cables is set to expand in the Arctic via the transarctic cable projects, is distributed acoustic sensing (DAS). This technology involves attaching devices to submarine cable ends to transform cables into sensors that detect waves striking them. These waves are then analyzed to detect anything passing close to, or even far from, the cable.

Applications in the Arctic

DAS: A technology already deployed in the Arctic.

DAS technology is already in use in the Arctic. For example, in Svalbard, international researchers have demonstrated that the cable connecting Longyearbyen to Ny Ålesund can detect whales, storms, ships and earthquakes (Landrø et al., 2022). In Alaska, the Quintillion cable is used to monitor ice conditions (Peña Castro, 2023). Thus, this technology enables the formation of sea ice to be detected more precisely and quickly than via satellite (Lin, 2023). DAS technology has also been used by international researchers in Greenland to study glacier calving (Gräff et al., 2025).

Polar Connect and Far North Fiber: SMART Cables

The major trans-Arctic cable projects, Far North Fiber and Polar Connect, will be manufactured and laid by Alcatel Submarine Networks, a leader and pioneer in the development of SMART sensors with its Climate Change Nodes, transforming these cables and the Arctic Ocean into a veritable laboratory for scientific research. The primary driver behind the Polar Connect transpolar cable project is scientific research, particularly the ambition to establish an Arctic Ocean observatory using SMART cables and maybe also DAS technology. Polar Connect is supported by the Nordic national research and education network NORDUnet. In its Vision 2030 document, NORDUnet states that "with a SMART cable, well equipped with several sensors in expedient locations, totally new opportunities for big leaps forward in various science disciplines will happen" (NORDUnet, 2024). The Arctic should then be able to provide data for scientific research on a larger scale than is currently possible.

A dual capability that is of interest to the defence sector

A growing awareness among governments

These cables, which are equipped with SMART sensors and DAS technology, have already attracted the attention of the defence community, particularly in the Arctic (Strachan, 2023; Larsen, 2025). Since DAS technology has been shown to be able to detect ships passing near the cable (Ramirez-Torres et al., 2021; Paap et al., 2025; Thiem et al., 2026), as well as whales, it could also be used to detect submarines, since the methods in use are similar to detect both. This method could supplement current surveillance systems based on satellite and AIS detection, which are limited in that they cannot detect underwater activities all the time and can be circumvented if a vessel turns off its signal. The advantages of this technology include improved real-time monitoring of maritime traffic over vast areas and securing and protecting critical subsea infrastructure against accidents and malicious acts. Indeed, DAS technology can help cable owners prevent damage to their cables in conjunction with AIS and also collect evidence that could be used in legal proceedings in the event of damage to a cable (Bryan, 2025). Furthermore, DAS technology can now detect anchor drops (Drapp and Mildner, 2025). Finland is therefore developing a cable

protection system based on this technology in the Baltic Sea which will alert the Finnish Border Guard, the Finnish Navy and the cable owner in the event of danger (Morales, 2026).

Military Use of Submarine Cables in the Arctic

This potential has raised concerns within the Norwegian Intelligence Service (NIS) that Russia might misuse DAS technology, even though Norway itself is conducting tests of this technology in the Arctic (Intelligence Online, 2026). Norway has invested in the Arctic Way cable, which, according to the Norwegian defence minister, will improve "situational awareness" in the region and connect Jan Mayen Island for the first time, as Norway is investing in military infrastructure on this island (Trine and Hansen, 2025). Furthermore, as early as 2024, Toke Binzer, the former director of Tusass, confirmed in the Danish newspaper Sermitsiaq that he was working on a civilian submarine fiber-optic cable that could have military applications as "a sensor-equipped submarine cable in the North Atlantic, which will be included in the defence agreement with Denmark" (Krarup, 2024; Højgaard Sørensen, 2025). This message has since been heeded (Thorsson, 2025).

In the US, however, this potential is not emphasized as much unless we look more closely, particularly at Quintillion, whose CEO proposed using the cable as "innovative solutions serving as eyes and ears under the sea and on the surface, in these critical Arctic waterways and transit routes" (Einpresswire, 2024).

Currently, no information is available from the US or Canadian authorities regarding the potential military use of data produced by future trans-Arctic cables, such as Far North Fiber. However, it is certain that this technology has dual-use capabilities. Some countries, including Ireland, have publicly stated their intention to use it to track vessels off their coasts, thanks to the Sea-Scan research programme (Department of Defence, 2026). This could be exploited in strategically important areas such as the Arctic, where tracking ships is difficult due to the region's vastness and inaccessibility.

In the field of submarine cables, a two-pronged process appears to be the new driving force behind investment and strong support from states such as Russia, Denmark, Norway and, above all, the EU in these new Arctic submarine cable projects. This process involves the securitization of submarine cables and the pursuit of greater digital sovereignty by states, which entails control over this infrastructure and a need for new routes, whilst allowing for dual use for both scientific research and military surveillance of the region.

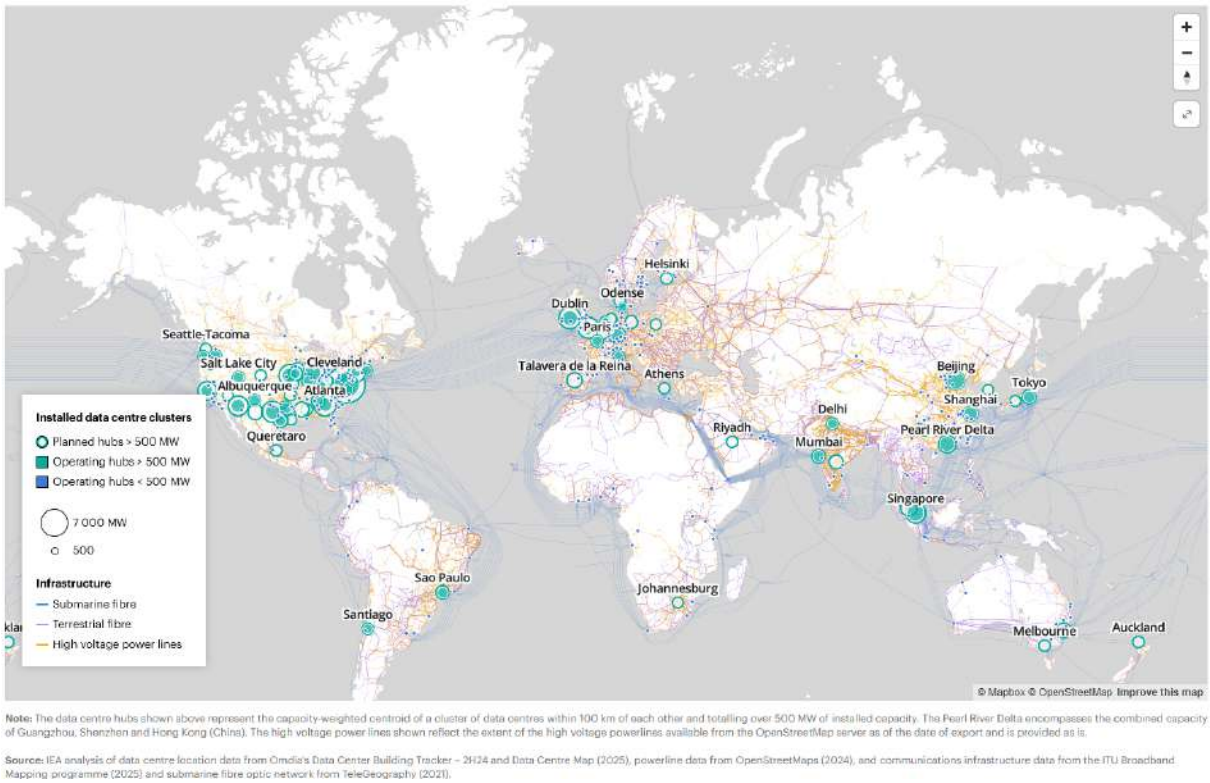
Storing and Analyzing Data in the Arctic: Data Centers and AI

Submarine cables are just one component of the digital infrastructure that supports our hyperconnected societies. For applications to function, they require servers and an ever-increasing number of data centers capable of implementing or training AI systems. A frantic race is underway to secure computing capacity for the various AI systems being developed, particularly by tech giants such as GAFAM, in Arctic and sub-Arctic regions and Nordic countries. Like submarine cables, data centers are also undergoing a significant dual process of securitization, driven by the development of AI and its physical infrastructure, as well as the pursuit of digital sovereignty through the control of the infrastructure underpinning this development.

Data centers and AI: rapid growth

Hypergrowth in a Market Dominated by Giants

The United States is the undisputed leader in this field. It hosts nearly 45% of the world's active data centers, with more than 5,400 in operation and accounting for 60% of global storage capacity (Carroué, 2025). It is followed by Germany (529 data centers), the United Kingdom (523), China (449), Canada (337) and France (322) (Fleck, 2026). These facilities tend to be concentrated in the same locations, meaning the vast majority of data centers are located in just twenty or so countries.



Note: The data centre hubs shown above represent the capacity-weighted centroid of a cluster of data centres within 100 km of each other and totalling over 500 MW of installed capacity. The Pearl River Delta encompasses the combined capacity of Guangzhou, Shenzhen and Hong Kong (China). The high voltage power lines shown reflect the extent of the high voltage powerlines available from the OpenStreetMap server as of the date of export and is provided as is.

Source: IEA analysis of data centre location data from Omdia's Data Center Building Tracker – 2H24 and Data Centre Map (2025), powerline data from OpenStreetMaps (2024), and communications infrastructure data from the ITU Broadband Mapping programme (2025) and submarine fibre optic network from TeleGeography (2021).

Figure 2. Map of the distribution of data centers around the World (IEA, 2025)

There are currently more than 800 data centers under construction worldwide (Perrigo, 2026) due to the increasing use of the internet for data-intensive activities, particularly artificial intelligence (AI). Since ChatGPT was launched in November 2022, investments from "Amazon, Microsoft, Meta, and Google have exceeded $600 billion, and much of that spending has gone toward data centers" (Wong, 2026). These companies are seeking computing capacities to develop and operate their AI applications. AI-related infrastructure spending is projected to exceed $1 trillion in 2027 and "reach $3 to $4 trillion annually by the end of this decade" (Burns, 2026).

The Energy Gap and the Climate Challenge

This growth has made access to energy a critical issue for data centers, prompting a race to meet the endless demand for processing power from hyperscale companies for their AI models and applications. In 2024, all types of data centers globally consumed 1.5% of electricity, equating to 415 TWh (IEA). If demand continues unabated, this figure could reach 1,000–2,000 TWh/year by 2030, representing 3–8% of global electricity consumption — equivalent to the total consumption of India, the world's third-largest consumer (The Shift Project, 2025; IFRI, 2025; Bogmans, 2025).

However, this growth is reaching physical limits in some areas due to the size and energy capacity of available power grids, particularly in regions where such infrastructure is well established, such as Virginia, where data centers already consume 26% of local electricity (Leppert, 2025). Consequently, some local grids are already saturated and unable to supply the energy required for AI development.

The limits of AI data center development

The rapid development of AI could result in an additional 1.7 gigatons of greenhouse gas emissions worldwide between 2025 and 2030 (Bogmans, 2025). Meanwhile, protest movements — often local, but not exclusively so — are emerging in increasing numbers against the construction of massive AI data centers. Fears of job losses due to AI, rising electricity costs and heavy water consumption are among the reasons behind these protests, which are gaining momentum. In the United States, no fewer than 130 billion dollars' worth of investments in AI data centers were blocked by local protests between January and June 2026 (McCurdy, 2026). According to a Gallup poll, at least 71% of Americans oppose the construction of new AI-dedicated data centers (Jones, 2026).

Faced with emerging limitations, some companies are looking for new locations in which to set up their AI mega-data centers. One option they have settled on appears to be the Arctic.

The Development of Data Centers in the Arctic

The advent of AI appears to be generating renewed interest in the Arctic among AI sector players, as it is becoming attractive for activities that do not require the lowest possible latency.

The Arctic as a new location for AI data centers?

According to Arctida, there were 32 data centers in the Arctic in September 2025, spread across all Arctic territories except Canada. These data centers represented a capacity of 870 MW, which is less than 1% of the global installed capacity (Ivanova and Farkhatdinov, 2025).

Until now, "traditional" data centers[4] have tended to be located as close as possible to their users, near major metropolitan areas, due to the need for applications such as streaming, video conferencing, gaming and trading to have the lowest possible latency. This criterion has effectively made Arctic regions, such as the European Arctic, unattractive to the sector (Khalili, 2025). However, some AI-related applications are no longer constrained by this need for low latency. According to Eray Alguzey, whilst AI is reshaping the entire data center sector "Today the map is being redrawn — and this time, it's not the compass pointing the way, but the thermometer." (Alguzey, 2026). As it is easier to move data than energy, finding suitable locations with sufficient access to energy for new AI data centers has become the main driver (Saini, 2026; Ballantine, 2026), making the Arctic attractive to industry players. Combined with the colossal energy demand and saturation of power grids in regions where data centers are typically located, latency has taken a back seat, making way for the search for electrical power as the top criterion during a period of phenomenal growth and a race to develop AI (Chennupati, 2025). In this regard, certain parts of the Arctic offer significant advantages to the sector. It is the arrival of "neo-clouds" players that

[4] By traditional we mean non AI Data Center

lease GPU computing capacity to hyperscalers[5] in the Nordic countries that will shape the growth of the AI sector in the Arctic (Khalili, 2025).

While the Arctic, sub-arctic and Nordic countries, particularly Iceland and Norway, are no stranger to growth in the data storage sector, with over 130 data centers across the Nordic countries, the region could be seen as a kind of *El Dorado*, fulfilling several functions. It offers inexpensive, green electricity from renewable sources such as geothermal, solar, wind and hydro, which is also stable, continuous and controllable. Furthermore, remoteness and rural location, which were once limiting factors, are now becoming advantages in the face of growing public opposition, since the Arctic has no shortage of space far from major population centers, nor of resources such as water and energy. Around 50 data centers are currently under construction in the Nordic countries, making this region the fastest growing in Europe (Khalili, 2025). This trend is even being felt in the Arctic. This growth is aided by favorable tax policies for the data center sector. Moreover, the data center sector in the Arctic appears to be expanding due to the presence of former or current energy-intensive industrial sites, such as paper mills in Finland and metal processing facilities, including aluminum plants in Iceland, as well as specific sites like former military bases. This is a process known as "infrastructural inheritance", as defined by Juha Saunavaara, Antti Laine and Matti Salo. (2022).

The Nordic countries and Iceland are at the top of the list

The Nordic countries are a top destination for "neo-clouds"— data centers that lease AI computing capacity to tech giants. In the first nine months of 2025 alone, more than half of the 414 MW of AI data center development contracts signed were in the Nordic countries, which experienced the strongest sector growth in Europe (CBRE, 2025). Key players in this sector include Microsoft, CoreWeave and Brookfield, which committed to investing over $15 billion in the region in 2025 alone, while the market for new Nordic data center construction is expected to reach nearly $8 billion by 2030 (Crosley, 2026; Saini, 2026). Nordic power grids appear capable of meeting the phenomenal demand from AI companies, whereas the European grid does not seem to have the capacity to accommodate them everywhere (Crosley, 2026).

One example is northern Norway, where the Stargate Norway project was announced in 2025. Initially spearheaded by OpenAI, it was later taken over by Microsoft (Welsch, 2025), with support from Nscale and Aker. The project plans to invest $6.2 billion in constructing a "500 MW facility in Narvik, northern Norway, which is expected to be operational in 2026. The facility will initially house 100,000 NVIDIA GPUs and will eventually be able to accommodate up to 250,000" (Khalili, 2025; Jackson, 2026; Open AI, 2025). This is one of the largest AI data center projects in Europe, and the northernmost ever built (Perrigo, 2026). It will initially consume 230 MW of energy, nearly as much as all the data centers currently operating in Norway combined (Perrigo, 2026).

Google, which has been present in Finland since 2009, has announced the expansion of its operations in Hamina, as well as the purchase of 2,500 hectares of land around the municipalities of Muhos, Kajaani, and Vaala for future infrastructure development in the country (Ivanova and Farkhatdinov, 2025). In September 2026, they announced plans to invest 13 billion dollars in developing AI data centers in the country (AFP, 2026). Other companies, such as TikTok

[5] It is a company that owns and operates cloud infrastructure and large-scale data centers for storing and processing huge amounts of data.

(Mukherjee and Kauranen, 2025), Nebius (Kauranen and Sterling, 2026) and Microsoft (Kauranen, 2025), have also announced investments worth billions in Finland.

In Borlänge, Sweden, EcoDataCenter is constructing a mega AI data center on the site of a former paper mill. French AI leader Mistral has committed 1.2 billion euros to the project (Nicol-Schwarz, 2026b). atNorth also plans to expand its operations in Sweden with a 300 MW data center in Sollefteå, which is located in the center of the country (AtNorth, 2026). Other players, such as Microsoft and Brookfield Asset Management, continue to invest billions in expanding their infrastructure in Sweden (Crosley, 2026).

In Iceland, which has historically attracted many Bitcoin miners who accounted for around 90% of the sector in 2018, the arrival of AI is changing the profile of "traditional" data centers. Consequently, industry players such as Nscale, Coreweave and Crusoe are now turning to AI rather than Bitcoin mining. According to atNorth CEO Magnús Kristinsson, "Crypto has reduced substantially in Iceland" (Moss, 2024).

Modest growth in North America and Russia

Alaska

The Arctic regions of North America and Russia have few or no data centers due to a significant lack of infrastructure, particularly in terms of access to reliable renewable energy resources and connectivity, which is often non-existent. The Canadian Arctic is the only region without any data centers, despite an attempt to establish one in Iqaluit in 2018 with the support of the Canadian Internet Registration Authority (CIRA) (Frizzell, 2018; Latour, 2018). Currently, Alaska has only two data centers, but it sees a potentially bright future for this sector. As early as 2024, the state's Republican governor, Mike Dunleavy, expressed support for establishing data centers in Alaska, emphasizing that the state "doesn't face the resource scarcity driving some of the opposition, and that its cold temperatures would reduce the need for cooling" (Herz, 2024). This call was reiterated more recently in Texas in October 2025 (Walker, 2025). The ever-expanding network of terrestrial and undersea cables, which is expected to eventually include the Far North Fiber trans-Arctic cable designed to connect Asia and Europe via the Northwest Passage and thus Alaska, is also cited as an advantage. One company appears to have taken the bait: Stak Energy, an Alaskan firm which has applied for a land lease to build a $500 million mega AI data center in the North Slope region. The facility is expected to cover an area of 2.6 square kilometres, near the Dalton Highway and adjacent to energy production sites. This location would avoid the usual obstacles encountered in southern US states, particularly the growing backlash against the construction of new large-scale data centers due to environmental impacts and resource consumption (Herz, 2026; Grove, 2026).

Finally, the race for AI development has been taken seriously right up to President Trump, who has asked the U.S. Air Force to lease land to potential data center projects across the country, including in Alaska (U.S. Air Force, 2026; The White House, 2025; DeMarban, 2026).

Russia

The country has 251 data centers with a total capacity of 1.8 GW, 80% of which are concentrated around Moscow. A further 128 centers are reportedly in the planning stages, including 42 that are currently under construction (The Moscow Times, 2026). According to official estimates, the sector's energy consumption is expected to more than double to reach 4.3 GW by 2030. This

growth is being driven by major industry players, such as Sber, Yandex, Rostelecom and Rosatom, and illustrates the expansion of the data center and AI sectors in Russia (HOBAK, 2026). As of September 2025, Arctida reported that there were only seven data centers in the Arctic, including those in Murmansk (built by MegaFon in 2019 and Rostelecom in 2022) which also take advantage of the region's existing industrial and energy infrastructure (Eidemiller, 2023). These data centers together account for 117 MW of power (Ivanova and Farkhatdinov, 2025). However, data center development remains closely tied to the Russian government, which views this sector as strategic and as a component of its digital sovereignty. Consequently, the sector is controlled by state-owned enterprises. Although the data center sector in the Russian Arctic is still in its infancy, the region is at the forefront of bitcoin mining. Since the 2010s, the region has attracted a significant number of Bitcoin miners, establishing the country as a key player in this field (The Moscow Times, 2025).

While Russia has made the digitization of the Arctic a national priority and has an AI development strategy in place, Vladimir Putin announced in late 2025 that the country intends to expand its AI capabilities by building data centers near 38 new Rosatom nuclear reactors, whether traditional or small modular reactors (SMRs), particularly in the Arctic (Xinhua, 2025). This is because the Moscow region can no longer support the development of this infrastructure due to a lack of available energy, largely because of grid congestion and Ukrainian drone strikes on the power grid. The stated goal is to build these energy-intensive AI data centers near energy production sites in the Arctic, rather than transporting these energy resources (HOBAK, 2026; eprussia, 2025). The region's leader, Aisen Nikolaev, announced that Yakutia has the capacity to host this infrastructure and that the region supports this development (AIRR, 2026). One project that illustrates this shift towards the Arctic is the mega-data center announced by Sibstar Group, a thermal coal supplier that is diversifying into digital infrastructure. In September 2025, the company announced plans to build a 20 MW data center at a cost of 1 billion rubles, with support and partial funding from the Russian government (dcforum, 2025). Thus, although the Russian Arctic region does not yet host any mega-data centers, there is federal and local commitment, and the foundations (crypto mining and abundant energy resources) are in place to facilitate the arrival of new AI data centers. These could connect to the Polar Express cable, further reinforcing its strategic importance.

However, although Russian rhetoric suggests a strong political will, it should be noted that operational data centers in the Russian Arctic remain isolated projects for now. The deployment of future projects faces major obstacles, such as remote locations, power grids yet to be built and connectivity issues (The Moscow Times, 2026). Furthermore, Russia is cut off from Western supply chains. Finally, the risk of permafrost thawing poses a significant threat to infrastructure in the Russian Arctic, not to mention high construction costs being a limiting factor.

Although Russia lags significantly behind the United States and China in the AI race (and is more interested in controlling the sector for reasons of digital sovereignty (Global Institute for National Capability, 2026)), the proliferation of bitcoin mining farms has indirectly provided the country with a substantial computing infrastructure that could be utilized in this race, given that some of these facilities have been "repurposed—at least partially—into computing centers for artificial intelligence training" (Estecahandy, 2025).

The specific case of Greenland

Greenland is a special case, as it has recently found itself at the center of geopolitical struggles once again, due to the ambitions of President Trump and certain individuals in his inner circle. Currently,

Greenland has one operational data center in Nuuk, owned by the local telecommunications company Tusass, and a second center is under construction (Yahoo Finance, 2026).

Although Greenland has very few data centers, with a population of just 56,000, outside players are increasingly interested in the advantages it has to offer deep-pocketed tech investors. The first of these is the project to establish a 'freedom city' — a concept that has been championed by certain tech billionaires since 2019, who envisage building a city on the island with minimal laws and regulations, making it ideal for the tech sector. Greenland also appears to be an attractive location for developing data centers and AI, according to some (McHugh, 2026). This is partly due to significant advantages, such as the island being largely uninhabited and having substantial hydroelectric power reserves (Alguzey, 2026). It is also located near North America and is connected by undersea cables to Iceland, Europe and North America, with redundant projects currently underway.

Drew Horn, a former member of staff in the first Trump administration, has announced plans to build a large-scale AI data center near Kangerlussuaq (The Tech Buzz, 2026a). He has stated that he is in discussions with the Greenlandic authorities via a local partner, Svend Hardenberg, who is the former Head of Department at the Premier's Office. The project involves building an AI data center on a former NATO base that could reach 1.5 gigawatts. An agreement signed by Greenlandic and American partners in Kangerlussuaq provides for future supply of necessary energy, construction of the data center and laying of a submarine cable (Thorsson, 2026). However, given the current state of relations between Greenland and Trump's United States, it is difficult to believe that such a project, estimated to cost several billion dollars (Nicol-Schwarz, 2026a), could come to fruition in the near future. The project still requires authorization from the local government to move forward (The Tech Buzz, 2026b). This is all the more pertinent given that Drew Horn is reportedly linked to a campaign to influence — or even destabilize — Greenlandic public opinion, which was exposed by the press in 2026 (Gettleman and Tekeli, 2026).

However, beyond this politically risky project, Greenland's potential is real. The trans-Arctic cable projects supported by the European Union (Far North Fiber, Polar Connect and Tusass Connect) will bring new opportunities to the island. Furthermore, the local energy company, Nukissiorfiit, appears willing to support the development of data centers, as it is considering commissioning new hydroelectric facilities in the future.

Significant limitations remain

We must consider the long list of announcements regarding cable and AI data center projects in the Arctic, in particular, and in sub-Arctic regions and the Nordic countries, more broadly. For these regions, these announcements may create the impression that the Arctic is set to become the next global hub for data and AI development. Nevertheless, this pales in comparison to other regions of the world that already host, and will continue to host, far more significant digital infrastructure. Currently, the Arctic accounts for just one per cent of the data center sector and is expected to have only a few more submarine cables in the long term, compared with the 600 currently in service worldwide. The challenges, costs and potential environmental impact of building such infrastructure in this part of the world must not be underestimated, nor must the actual effects on the local population, particularly with regard to data centers, given that this sector is extremely energy-intensive and the potential for pollution and rising electricity prices and scarcity of this resource must be considered.

Pollution in the Arctic poses a significant challenge in regions where infrastructure and response capabilities are limited. This threatens an ecosystem that is already affected by the consequences of global warming more than anywhere else on the planet. The recent case involving Google in Finland, where trees were illegally cut down to make space for two data centers in Muhos and Kajaani, is emblematic of the behavior of powerful multinational corporations. Google acted without the necessary authorization in a country where the rule of law is a cornerstone of democracy (Bryant, 2026). Furthermore, such practices could exacerbate the existing backlash, as demonstrated by the numerous protest movements that have emerged in the United States and certain Arctic countries, including Norway (Holm, 2026; Perrigo, 2026).

Furthermore, the benefits of developing AI data centers in the Arctic, subarctic regions and the Nordic countries are unclear to local communities and governments, particularly when such infrastructure is funded by US companies, as in Narvik, Norway. In such cases, the contribution to strengthening states' digital sovereignty can be strongly contested, and the positive impacts on local communities — particularly in terms of employment — remain very limited to date.

Conversely, submarine cables – particularly those developed and supported directly by states – seem to play a significant role in bolstering the digital sovereignty of those states, while providing a vital connection for local communities and directly benefiting the states themselves and all sectors of the economy. Powerful new drivers are fueling investment in submarine cables in the Arctic, with stakeholders now willing to cover the costs of submarine fibre-optic cable projects. These cables will feature SMART and/or DAS capabilities, enabling them to generate data of interest to the scientific community and potentially the defence sector. However, questions remain regarding who will have access to this data, what types of data can be collected and where it should be stored. Furthermore, military use of this data could alter the nature of this civilian infrastructure, complicating its deployment, which has been relatively straightforward until now.

While the laying of new submarine fibre-optic cables will clearly benefit Arctic communities by improving connectivity, states will also benefit, enhancing their digital sovereignty in the process. However, the positive impact of AI data centres in the Arctic raises far more questions. Will this development truly strengthen states' digital sovereignty, or will it primarily serve the interests of hyperscalers and GAFAM, most of which are based outside the countries in which they invest? Furthermore, the benefits for local populations in the Arctic and sub-Arctic regions, as well as for the Nordic countries, are currently unclear.

Conclusion

The international security landscape, the need to secure undersea cables, and the pursuit of resilience and digital sovereignty have driven some nations, such as Russia and the European Union, to provide strong political and financial support for Arctic cable projects that had previously been unable to get off the ground due to a lack of funding. In the field of data centers, the paradigm shift is the explosion in demand for computing power and AI, but also the quest for digital sovereignty from States that support investments in the sector. This computing power does not necessarily require low latency, making search for energy the top priority and thus rendering the Arctic a viable option for hosting multi-billion-dollar AI mega-data centers, such as those in Narvik, Norway, Alaska or Greenland.

Through all these infrastructure projects, the Arctic could become an increasingly important region for the transmission, production, storage and analysis of digital data for the global economy. Nevertheless, this vision faces significant limitations as data centers remain predominantly located in major cities, particularly in the United States. While the Arctic has many advantages, many AI data center projects will initially be developed outside the region, particularly thanks to liquid cooling technology, making the Arctic a secondary location in this sector. Furthermore, protests are already emerging in Norway. Also, northern Norway, like other Nordic countries, is located close to Russia, which could make these mega AI data centers potential targets for Russia, as it was the case in the Middle East following the Iranian strikes. Furthermore, Arctic infrastructure is far from universally suited to accommodate these facilities. Iceland's power grid, for example, is currently operating at maximum capacity and is relying on the closure of its aluminum plants in order to attract new data centers (Moss, 2024). Moreover, some locations still lack the necessary cable connections, which have failed to materialize over the past 25 years. While financial and political support from the European Union and Russia for trans-Arctic cable projects is unprecedented, the announced funding — particularly for European projects — is still far from being secured. The Polar Connect and Far North Fiber projects, for example, are jointly estimated to cost 4.289 billion euros, according to the EU (European Commission, 2026). Assuming the security context persists alongside the political will to strengthen European digital sovereignty, these cable projects may come to fruition. Meanwhile, in the field of data centers, some of the announced projects may become a reality to feed the big tech companies' insatiable appetite for developing their AI applications, provided that the AI bubble does not burst soon (Sitaraman and Ramzanali, 2026) and the limitations of the Arctic are overcome

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