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RECOMMENDATIONS FOR THE

INDIA-NORDIC SUMMIT

ANURAG BISEN

VIF BRIEF

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Abstract

India's engagement with the five Nordic states, Denmark, Finland, Iceland, Norway, and Sweden, reflects a growing multidimensional strategic convergence rooted in shared interests in sustainability, technological innovation, resilient infrastructure, and rules-based international cooperation. The Nordic region's strengths in the maritime sector, green technologies, environmental control, institutional finance, and advanced defence capabilities align closely with India's developmental priorities and long-term strategic objectives.

This Policy Brief examines the evolving potential for India–Nordic cooperation across six key vectors: shipbuilding and maritime infrastructure, space collaboration, environmental governance, clean energy transition, investments and institutional capital mobilisation, and defence and security cooperation. It analyses existing frameworks, identifies emerging opportunities, and highlights areas where deeper collaboration can generate mutual strategic and economic gains. The Brief also offers policy recommendations aimed at strengthening and institutionalising India's engagement with the Nordic states across these six sectors.

Introduction

Prime Minister Modi is scheduled to visit Norway for the 3rd India-Nordic Summit in Oslo on May 19, 2026, with participation from the Prime Ministers of Norway, Denmark, Finland, Iceland, and Sweden[1]. The Summit will build on the two previous Summits (Stockholm, April 2018 and Copenhagen, May 2022), and impart a more strategic dimension to India's relationship with the Nordic countries, especially in technology and innovation; the green transition and renewable energy; sustainability; the blue economy; defence; and space and the Arctic. The visit will also provide a fillip to India's bilateral trade (USD 19 billion in 2024) and investment ties with the Nordic countries, as well as help build resilient supply chains following the India-EFTA (European Free Trade Association) TEPA (Trade and Economic Partnership Agreement) (2024) and India-EU FTA (2026)[2].

The Nordic countries occupy a unique and influential place in the Arctic region, shaped by shared geography and historical, cultural, and political identity. Comprising Norway, Sweden, Finland, Denmark (through Greenland and the Faroe Islands), and Iceland, these countries have shaped the narrative of *Arctic exceptionalism* around peace, stability and indigenous peoples, as an enduring dimension of Arctic international relations[3]. Indeed, the setting up of the Arctic Council in 1996 was driven substantially by Nordic diplomatic initiatives and their long-standing tradition of regional cooperation through institutions such as the Nordic Council, which

1 "Visit of Prime Minister to UAE, Netherlands, Sweden, Norway, and Italy (May 15 - 20, 2026)," Ministry of External Affairs, Government of India, accessed May 12, 2026, https://mea.gov.in/press-releases.htm?dtl/41126.

2 Minist. Extern. Aff. Gov. India, "Visit of Prime Minister to UAE, Netherlands, Sweden, Norway, and Italy (May 15 - 20, 2026)."

3 Barry Scott Zellen, Arctic Exceptionalism: Cooperation in a Contested World (Lynne Rienner Publishers, 2024), https://doi.org/10.1515/9781962551274.

preceded the Arctic Council by 44 years[4].

Although the Nordic Arctic is far smaller than the vast Russian Arctic in terms of territory, population, and natural resources, the Nordic states exert an influence in Arctic affairs disproportionate to their size. Their global leadership in human development, ice-class shipbuilding, polar research, clean and green technologies, renewable energy, and abundant reserves of critical minerals, including rare earth resources, gives them significant strategic relevance. China recognised this early on. In 2013, the same year it became an Observer in the Arctic Council, along with India, it set up the China-Nordic Research Centre (CNARC) in Shanghai, by 10 Member Institutes, four Chinese and six Nordic, *to promote cooperation for sustainable development of the Nordic Arctic and coherent development of China in a global context*[5].

For India, which is steadily expanding its Arctic engagement, deeper partnerships with the Nordic countries offer valuable opportunities in areas such as sustainable Arctic development, polar science, green shipping, resilient infrastructure, energy transition technologies, and defence.

Nordics' Arctic Relevance and India's Engagement

India's engagement with the Arctic dates to 1920, when the 'Spitsbergen (Svalbard) Treaty' was signed and India became one of the 14 original high contracting parties[6]. India has been an Observer in the Arctic Council since 2013 and has maintained a permanent research station in the Arctic (*Himadri* at Ny-Ålesund, Svalbard) since 2008. It has conducted 16 expeditions to the region,

4 "The Nordic Council | Nordic Cooperation," accessed May 12, 2026, https://www.norden.org/en/nordic-council.

5 "Organisation - China-Nordic Arctic Research Centre - CNARC," accessed May 14, 2026, https://www.cnarc.info/organization.

6 "UNTC," accessed May 14, 2026, https://treaties.un.org/Pages/showDetails.aspx?objid=0800000280203789.

resulting in over 500 research visits to Ny-Ålesund from over 64 Indian universities/institutes. India is undertaking several scientific studies and research in the Arctic region across the research themes of Atmospheric Sciences, Environmental Sciences, Cryospheric Studies, Space Sciences, Biological Sciences, Geosciences and Marine Sciences.

India's Arctic Policy, titled "Building a Partnership for Sustainable Development," was released in March 2022[7] to address the impacts of Arctic warming on India's climate, economy, and energy security. Arctic–Monsoon teleconnections have a significant bearing on India's economy, water, and food security. The policy is based on six key pillars, including scientific research, climate change mitigation, and economic cooperation, positioning India as a proactive, science-driven stakeholder in the Arctic region.

Denmark's Arctic Council membership stems from its authority over Greenland, a territory with significant autonomy since gaining Home Rule in 1979 and further Self Rule in 2009. Although Greenland manages its natural resources and has its own government, it remains part of the Danish Kingdom, with Denmark retaining control over defence and foreign affairs. Denmark is the current chair of the Arctic Council (2025-2027) and has identified five priority areas during its chairmanship: Indigenous Peoples, Sustainable Economic Development and Energy Transition Solutions, Oceans, Climate change, and Biodiversity[8]. Greenland, which has been in the news lately due to the US President Trump's repeated efforts to acquire it, released its first Foreign, Security, and Defence Strategy in 2024, outlining its aspirations for increased self-determination, regional influence, and active participation in Arctic affairs, while

7 Government of India, Ministry of Earth Sciences. India and the Arctic: Building a Partnership for Sustainable Development. New Delhi: Ministry of Earth Sciences, 2022. https://www.moes.gov.in/static/uploads/2025/07/23b232e6d6a8a7d2f1d9b187a2855330.pdf

8 "Kingdom of Denmark's Chairship, 2025-2027," Arctic Council, accessed May 13, 2026, https://arctic-council.org/about/kingdom-of-denmarks-chairship-2025-2027/.

maintaining a crucial partnership with Denmark[9].

Greenland has vast untapped mineral reserves, including rare earth elements estimated to be among the world's eighth-largest deposits, as well as substantial uranium reserves considered among the largest globally[10]. These resources are of considerable importance to India, enabling diversification and securing resilient supply chains for critical minerals, particularly amid growing geopolitical competition and overreliance on limited suppliers. Access to Greenland's critical mineral resources could support India's long-term clean energy ambitions, strengthen its manufacturing capabilities, and contribute significantly to achieving its net-zero emissions targets. Indian scientists have participated in the East Greenland Ice-core Project (EastGRIP), which aims to retrieve an ice core by drilling through the Northeast Greenland Ice Stream (NEGIS) in 2023[11].

Finland, occupies a distinctive position in Arctic governance despite its relatively small population and geography. Through its 2021 Arctic Strategy, it emphasises climate change mitigation, indigenous Sámi rights, scientific research, resilient infrastructure, and sustainable development[12]. Finland strongly supports the Arctic Council as the principal forum for Arctic cooperation. It has emerged as a global leader in environmentally responsible Arctic development, renewable energy, forest management, polar technologies, and icebreaking capabilities, operating one of the

9 Paul Cohen and Tuluttut Translations, Naalakkersuisut / Government of Greenland Ministry for Statehood and Foreign Affairs, n.d.

10 jcookson, "Greenland's Critical Minerals Require Patient Statecraft," Atlantic Council, January 13, 2026, https://www.atlanticcouncil.org/dispatches/greenlands-critical-minerals-require-patient-statecraft/."container-title":"Atlantic Council"",""language":"en-US"",""title":"Greenland's critical minerals require patient statecraft"",""URL":"https://www.atlanticcouncil.org/dispatches/greenlands-critical-minerals-require-patient-statecraft/"",""author":[{"family":"jcookson"",""given":""}],"accessed":{"date-parts":[["2026",5,13]]},"issued":{"date-parts":[["2026",1,13]]}}],"schema":"https://github.com/citation-style-language/schema/raw/master/csl-citation.json"}

11 Iben Koldtoft, "EastGRIP - The East Greenland Ice-Core Project," University of Copenhagen, February 23, 2016, https://eastgrip.nbi.ku.dk/.

12 "Finland's Strategy for the Arctic Region," Työ- ja Elinkeinoministeriö, accessed May 13, 2026, https://tem.fi/en/finlands-strategy-for-the-arctic-region.

world's most advanced fleets of polar icebreakers.

For India, Finland's expertise is strategically significant. Finland's advanced know-how in icebreakers, Arctic logistics, clean energy, sustainable infrastructure, telecommunications, and climate adaptation can support India's expanding Arctic engagement and its indigenous shipbuilding capability. Enhanced cooperation with Finland through a Memorandum of Understanding (MoU) on Arctic Cooperation could significantly strengthen India's Arctic scientific presence, maritime capabilities, and long-term strategic engagement in the region.

Iceland has consistently championed sustainable development, climate action, marine environmental protection, renewable energy, and inclusive Arctic governance rooted in international law and the United Nations Convention on the Law of the Sea (UNCLOS). It has also emerged as a major convening hub for Arctic diplomacy through the *Arctic Circle* initiative launched by former Icelandic President Ólafur Ragnar Grímsson[13]. The annual *Arctic Circle Assembly*, held in Reykjavík, claims to be the world's largest gathering of Arctic stakeholders and professionals outside the formal Arctic Council framework, bringing together governments, scientists, industry, militaries, indigenous representatives, and observer states[14]. Significantly, the *Arctic Circle India Forum* was hosted in New Delhi in May 2025[15], reflecting India's growing importance in Arctic affairs. Iceland is also preparing for future ice-free Arctic summers by increasingly positioning itself as the "Dubai of the North"[16]a logistics, aviation, data connectivity, transhipment, finance, tourism, and Arctic services hub strategically located

13 "Arctic Circle," Arctic Circle, accessed May 13, 2026, https://www.arcticcircle.org/about.

14 "Assemblies," Arctic Circle, accessed May 13, 2026, https://www.arcticcircle.org/assemblies.

15 "The Arctic Circle India Forum," Arctic Circle, accessed May 13, 2026, https://www.arcticcircle.org/.

16 Gil-Alana, Luis & Huijbens, Edward. (2018). Tourism in Iceland: Persistence and seasonality. Annals of Tourism Research. 68. 20-29. 10.1016/j.annals.2017.11.002.

between North America, Europe, and the Arctic Ocean.

Iceland has also developed notably close economic and scientific ties with China, becoming the first European country to sign a Free Trade Agreement with Beijing in 2013[17]. Chinese entities have shown sustained interest in Icelandic geothermal energy, scientific cooperation, and satellite infrastructure. The China-Iceland Arctic Science Observatory (CIAO) in Karholl, North Iceland, was established in 2018 by the Polar Research Institute of China (PRIC) and the Icelandic Centre for Research (RANNIS)[18]. Cooperation between Chinese institutions and Icelandic universities and Arctic research centres has also expanded over the past decade. While Iceland offers valuable opportunities in geothermal energy, Arctic science, and satellite observation, India will also need to factor in the growing Chinese footprint in Reykjavík.

Norway is the largest country and the biggest economy among the Nordics and occupies a central position in Arctic governance. Norway has consistently promoted an Arctic framework based on international law, sustainable development, scientific cooperation, and rules-based governance, while simultaneously maintaining robust defence and maritime capabilities in the *High North*. Norway views the Arctic as a region for cooperation rather than confrontation, although growing geopolitical competition has led Oslo to strengthen its security posture and strategic coordination with NATO allies. Its Arctic policy emphasises climate action, ocean governance, green technologies, indigenous Sámi rights, sustainable fisheries, clean energy transition, and technological innovation.

Norway's globally recognised expertise in shipping, offshore energy, marine spatial planning, fisheries management, subsea technologies, and Arctic logistics is of considerable strategic relevance to India.

17 "Government of Iceland | Iceland First European Country to Sign Free Trade Agreement with China," accessed May 13, 2026, https://www.government.is/news/article/2013-04-15-Iceland-First-European-Country-to-Sign-Free-Trade-Agreement-with-China.

18 "Polar Research Institute of China," accessed May 13, 2026, https://en.pric.org.cn/index.php?c=category&id=99.

Bilateral cooperation between India and Norway has expanded steadily in recent years through initiatives such as the India–Norway Ocean Dialogue[19], collaboration on marine spatial planning, blue economy projects, pollution control and waste management under the India–Norway Marine Pollution Initiative[20], renewable energy cooperation, and joint investments through Norway's sovereign wealth ecosystem. Norwegian companies are also increasingly participating in India's green shipping, offshore wind, maritime infrastructure, and clean energy sectors.

The National Centre for Polar and Ocean Research (NCPOR), India and the Norwegian Polar Institute (NPI) signed an MoU in June 2024 to strengthen cooperation in polar science, operations, and research, specifically targeting the Arctic and Antarctic regions[21]. An Indo-Norwegian Research Project '*Pliocene Arctic Climate Teleconnection*' (PACT) is being undertaken jointly by NCPOR and NPI for high-resolution reconstruction of the Arctic climate during the Mid-Pliocene Warm Period (MPWP) and to explore its teleconnections with South Asian and Australian Monsoon systems. Indian polar scientists have been undertaking an Arctic Ocean cruise on board the Norwegian ice breaker to Arctic regions such as the Fram Strait and the North Pole[22].

The Nordic summit in Oslo will be preceded by bilateral interaction with Norway, including PM Modi's talks with Prime Minister Jonas Gahr Støre and a formal call on King Harald V and Queen Sonja. This is PM Modi's first visit to Norway and the first visit by an Indian Prime Minister to Norway in 43 years. The visit will explore avenues to further strengthen India-Norway relations, with a focus

19 "NO20B3709.Pdf," n.d., accessed May 13, 2026, https://www.mea.gov.in/Portal/LegalTreatiesDoc/NO20B3709.pdf.

20 UNEP, n.d., accessed May 13, 2026, https://www.indianorwaymarinepollutioninitiative.in/.

21 "News: NATIONAL CENTRE FOR POLAR AND OCEAN RESEARCH (NCPOR), GOA," accessed May 14, 2026, https://ncpor.res.in/news/view/758.

22 Gathered through interactions by the author

on trade and investment, capitalising on the India–EFTA Trade and Economic Partnership Agreement, as well as clean and green tech and the blue economy. The visit will also be an opportunity to seek investment from Norway's Government Pension Fund (GPFG), which has close to USD 28 billion in the Indian capital market[23].

As India expands its Arctic footprint, Norway's role will remain critical for India's long-term interests in the Arctic.

Sweden PM Modi will travel to Sweden on 17-18 May 2026 for a bilateral visit, before visiting Norway[24]. India is exploring collaboration in green transition, AI, emerging technologies, startups, resilient supply chains, defence, space, climate action and people-to-people ties[25].

Although Sweden's Arctic region, comprising Västerbotten and Norrbotten counties, is sparsely populated, it holds significant strategic importance due to its advanced industrial base, critical mineral resources, space infrastructure, and polar research capabilities. Sweden's 2020 Arctic Strategy underscores the importance of maintaining the Arctic as a region of low tension, governed by international law and cooperative multilateralism through the Arctic Council and the UNCLOS[26]. It also places strong emphasis on climate change mitigation, indigenous Sámi rights, sustainable economic development, environmental monitoring, and

23 "Visit of Prime Minister to UAE, Netherlands, Sweden, Norway, and Italy (May 15 - 20, 2026)," Ministry of External Affairs, Government of India, accessed May 13, 2026, https://mea.gov.in/press-releases.htm?dtl/41126.

24 "Visit of Prime Minister to UAE, Netherlands, Sweden, Norway, and Italy (May 15 - 20, 2026)," Ministry of External Affairs, Government of India, accessed May 13, 2026, https://mea.gov.in/press-releases.htm?dtl/41126.

25 Minist. Extern. Aff. Gov. India, "Visit of Prime Minister to UAE, Netherlands, Sweden, Norway, and Italy (May 15 - 20, 2026)."

26 "Swedens-Strategy-for-the-Arctic-Region-2020.Pdf," n.d., accessed May 13, 2026, https://www.government.se/contentassets/85de9103bbbe4373b55eddd7f71608da/swedens-strategy-for-the-arctic-region-2020.pdf.

international scientific collaboration[27].

For India, Sweden's globally recognised strengths align closely with India's priorities in clean energy transition, resilient supply chains, digital transformation, and Arctic research. The Swedish Space Corporation's Esrange facility at Esrange Space Centre has already emerged as an important node for India's expanding space cooperation and satellite data access in polar orbits[28]. Sweden is also an important source of critical minerals and rare earth elements[29]. Deeper India–Sweden cooperation in Arctic science, space collaboration, clean technologies, critical minerals, and sustainable industrial systems could become an important pillar of India's long-term Arctic engagement.

The following section examines potential India-Nordic cooperation across six vectors: Shipbuilding, Space, Environment, Clean Energy, Investments and Defence.

Shipbuilding

Denmark's OMT and DALO Ecosystem Odense Maritime Technology (OMT) functions as a marine consultancy for advanced ship design rather than direct manufacturing, possessing expertise across the Engineering, Procurement, Construction and Operations verticals[30]. OMT serves as the primary naval designer for the Danish Ministry of Defence Acquisition and Logistics Organisation (DALO) and is a consortium partner along with the Royal Danish

27 "Swedens-Strategy-for-the-Arctic-Region-2020.Pdf."

28 "Dhruva Space and Swedish Space Corporation Expand Ground Station Network Synergies," accessed May 13, 2026, https://www.dhruvaspace.com/press-releases/dhruva-space-and-swedish-space-corporation-expand-ground-station-network-synergies-indicative-of-the-long-standing-indo-swedish-bilateral-cooperation.

29 "Critical and Strategic Raw Materials," accessed May 13, 2026, https://www.sgu.se/en/mineral-resources/critical-raw-materials/.

30 "About Us – OMT," accessed May 13, 2026, https://odensemaritime.com/about-us/.

Navy for designing and constructing their naval vessels[31]. It is also engaged in the ongoing T31 frigate program for the Royal Navy, being constructed in the United Kingdom, frigate programs in Poland and Indonesia and has provided the design of a new class of large Multi-Role Combat Vessels (MRCV) developed for the Republic of Singapore Navy[32].

Indian shipyards possess heavy manufacturing capacity that Denmark lacks, through state-owned enterprises such as Cochin Shipyard Limited (CSL), Mazagaon Dock Shipbuilders Limited (MDL), and Garden Reach Shipbuilders & Engineers (GRSE), as well as the private conglomerate Larsen & Toubro's Kattupalli facility. CSL has demonstrated the capacity to build to stringent European specifications through the ongoing construction of zero-emission feeder container vessels for Norway's Samskip Group[33] and diesel-electric cargo ships for Wilson Shipowning AS[34].

By encouraging Indian shipyards to collaborate with OMT via Public-Private Partnerships, they can address the design-deficiency gap and execute joint/OMT designs for domestic naval and commercial requirements and for export markets.

Danish Maritime Research Alliance Another potential area of cooperation is between the Indian Centre of Excellence in Maritime and Shipbuilding (CEMS) and the Indian Ship Technology Centre (ISTC), which serves as the premier national hub for indigenous ship design, research, and technical consultancy[35] with the Danish

31 "OMT FOOTPRINTS – OMT," accessed May 13, 2026, https://odensemaritime.com/cases2/case-2/.

32 "OMT FOOTPRINTS – OMT."

33 "Welcome to Cochin Shipyard: ISO 9001 Certified - The Biggest Greenfield Shipyard of the Millennium," accessed May 13, 2026, https://cochinshipyard.in/news/view/48.

34 PSU Watch Bureau, "Udupi Cochin Shipyard Delivers India's First Green Cargo Vessel to Norway," PSU Watch, April 24, 2025, https://psuwatch.com/newsupdates/udupi-cochin-shipyard-delivers-indias-first-green-cargo-vessel-to-norway.

35 http://istcindia.org/

Maritime Research Alliance[36] (MRA). It is a non-profit network organisation for maritime researchers in Denmark, which is supported by The Danish Maritime Fund and D/S Orients Fond and works to facilitate collaboration within maritime research and education[37]. The MRA *ShippingLab* initiative facilitates collaboration and supports projects on digitalisation, decarbonisation, the green transition, and safety, while the *Green Ship of the Future* initiative acts as a strategic network and knowledge forum, creating space for idea development, technological sparring, and collaboration, to accelerate the green transition of shipping[38].

India aims to emerge as one of the world's top ten shipbuilding nations by 2030, with a target of capturing five per cent of the global shipbuilding market and subsequently positioning itself among the top five global shipbuilding powers by 2047[39]. To realise this ambition, India plans to expand its domestic shipbuilding capacity to approximately 3 million gross tonnage (GT) annually by 2047, while developing 10 world-class shipyards through public-private partnerships (PPP), foreign collaboration, and technology partnerships with leading maritime nations. Simultaneously, India is also seeking to build a highly skilled maritime workforce by training nearly 50,000 maritime personnel by 2030, thereby strengthening the country's long-term industrial, commercial, and strategic maritime capabilities[40]. These collaborations will help India to achieve its stated aims in the Maritime India Vision 2030 (MIV 2030).

Green Shipping and Alternative Fuels Driven by the 2020 Green

36 "Maritime Research Alliance," accessed May 13, 2026, https://www.mra.dk/.

37 "Maritime Research Alliance."

38 "The Research Ecosystem | Maritime Research Alliance," accessed May 13, 2026, https://www.mra.dk/about-us/the-research-ecosystem/.

39 "MARITIME INDIA VISION 2030," accessed May 13, 2026, https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=2080012.

40 "MARITIME INDIA VISION 2030."

Strategic Partnership between India and Denmark[41], collaborative efforts target operational development of green shipping corridors through the Mærsk McKinney Møller Centre for Zero Carbon Shipping in Copenhagen[42].

The Centre is developing regulatory frameworks for zero-emission shipping and alternative fuel bunkering systems, including the Maritime Book & Claim mechanism for fuel lifecycle emissions verification and the NoGAPS (No Gas or Particulate Sulphur) project for dual-fuel vessels operating on e-methanol and green ammonia.[43].

India currently produces nearly 19 million tonnes of grey ammonia annually, largely for fertiliser production, and under the National Green Hydrogen Mission, it aims to scale total ammonia production to 28 million tonnes by 2034, including green maritime fuels[44]. Deendayal, V.O. Chidambaranar, and Paradip Ports have been designated as dedicated green hydrogen hubs.

Adoption of Danish regulatory standards and fuel certification systems could enable these ports to integrate into emerging global green shipping corridors, including those linked to the Northern Sea Route and Arctic maritime trade.

India's Polar Research Vessel The First Indian Scientific Expedition to Antarctica was launched in 1981. Thereafter, since 2004, India has also been undertaking scientific endeavours in the Southern Oceans, and since 2007, Indian scientists have had a sustained presence in the

41 "Joint Statement for India-Denmark Green Strategic Partnership," Ministry of External Affairs, Government of India, accessed May 13, 2026, https://mea.gov.in/bilateral-documents.htm?dtl/33069/Joint_Statement_for_IndiaDenmark_Green_Strategic_Partnership=.

42 "Joint Press Release," accessed May 13, 2026, https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=2134588.

43 "Decarbonising the Global Maritime Industry | Mærsk McKinney Møller Centre for Zero Carbon Shipping," Maersk Zero Carbon Shipping, accessed May 13, 2026, https://www.zerocarbonshipping.com/www.zerocarbonshipping.com.

44 "PIB Backgrounder," accessed May 13, 2026, http://www.pib.gov.in/PressNoteDetails.aspx?NoteId=155990.

Arctic. These expeditions have been undertaken every year on board ice-class vessels/icebreakers chartered from the international market, which are cargo ships capable of transporting men and material but are ill-suited to serve as a research platform. Additionally, the charter charges of these vessels have been escalating over the years, leading to outgo of precious foreign exchange. All these factors severely impede India's polar research efforts.

The Cabinet Committee on Economic Affairs had approved the acquisition of Polar Research Vessel (PRV) in 2014, at a total cost of ₹1051.13 crore, within a period of 34 months[45]. However, the vessel is yet to see the light of day.

In 2025, an MoU was signed between Kolkata-based Garden Reach Shipbuilders and Engineers Limited (GRSE) and Norway's Kongsberg Oslo, which envisages that GRSE will receive design expertise for developing the PRV, enabling India to build its first-ever PRV indigenously[46]. The PRV cost and the completion timeline have been revised to ₹2329.40 Crores and 2029-30, respectively[47].

In 2023, it was reported that India had put forth a proposal for the joint manufacturing of non-nuclear icebreakers with Russia, in Indian shipyards[48]. Subsequently, in 2024, reports stated that the Indian government had sounded out two shipbuilders - one state-owned and the other private- to build four non-nuclear icebreaker ships estimated to be worth over Rs 6,000 crores for Russia's

45 "Acquisition of a Polar Research Vessel," accessed May 13, 2026, https://www.pib.gov.in/newsite/PrintRelease.aspx?relid=110933&reg=3&lang=2.

46 "India to Build First-Ever Polar Research Vessel (PRV) as GRSE Signs MoU with Norway's Kongsberg," accessed May 13, 2026, https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=2133528.

47 "PARLIAMENT QUESTION: PRV FOR ARCTIC RESEARCH," accessed May 13, 2026, https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=2153574.

48 Sputnik India, "Russian Minister Unveils India's Bid to Mutually Build Non-Nuclear Icebreakers," Sputnik India, 20230913T1939 530, https://sputniknews.in/20230913/russian-minister-unveils-indias-bid-to-mutually-build-non-nuclear-icebreakers-4230838.html.

state-owned nuclear energy company ROSATOM[49] and a deal was expected to be signed during the Russian President's visit to India in December 2025 for the India-Russia summit[50].

On 20 March 2026, an announcement of a strategic partnership agreement for the design, construction and delivery of eight LNG /LPG Gas Carriers between Kanhoji Shipyard Limited (India), Marine Complex Systems (MSC) (Russia) and United Shipbuilding Corporation (JSC Sudoexport) (Russia) was made by CGI, St Petersburg, Russia[51].

India, even though possessing adequate shipbuilding capability and capacity, does not have the design capability for ice-class vessels capable of operating in Polar regions and would need to collaborate with entities possessing that expertise.

Indian Flagged LNG/LPG Carriers India is the world's second-largest LPG consumer, and fourth-largest LNG importer[52]. India's natural gas and LPG imports stand at approximately 100 MMSCMD (Million Metric Standard Cubic Meters per Day), and around 20 million tonnes annually, making our import dependence about 50 per cent for natural gas, and about 67 per cent for LPG[53].

49 www.ETInfra.com, "Russia Eyes Indian Yards to Build Four Non-Nuclear Icebreaker Ships to Back Its Northern Sea Route Plan," ETInfra.Com, accessed May 13, 2026, https://infra.economictimes.indiatimes.com/news/ports-shipping/russia-eyes-indian-yards-to-build-four-non-nuclear-icebreaker-ships-to-back-its-northern-sea-route-plan/114123309.

50 Vijainder K. Thakur, "Modi-Putin Summit: India Likely to Sign Deal to Build Ice-Class Vessels with Russia in $100B Trade Push," EURASIAN TIMES, November 20, 2025, https://www.eurasiantimes.com/india-likely-to-sign-deal-to-build-ice-class-vessels-for-russia/.

51 India in St. Petersburg [@indianconsspb], "Pursuant to participation of Indian companies in NEVA 2025 exhibition and conference in September 2025, wherein the Consulate General of India facilitated various meetings between stakeholders from India and Russia, a STRATEGIC PARTNERSHIP AGREEMENT was inked on 16th March, https://t.co/5Ve0rmbLjZ," Tweet, Twitter, March 20, 2026, https://x.com/indianconsspb/status/2034908877515522393.

52 "India's Energy Supply Fully Secure; Government Calls Out Deliberate Misinformation Campaign," accessed May 13, 2026, http://www.pib.gov.in/PressReleaseDetail.aspx?PRID=2245615&reg=3&lang=1.

53 "Inter-Ministerial Briefing Held on Recent Developments in West Asia," accessed May 13, 2026, https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=2238525.

As of 2025, only around 20 per cent of India's trade cargo is handled by Indian-flagged or Indian-owned vessels, up from 8 per cent in 2018, but still far below the strategic threshold needed for self-reliance.

India's LPG imports are carried almost entirely by foreign-flagged vessels. The Strait of Hormuz closure in March 2026 stranded 34 LPG carriers in the Persian Gulf, directly threatening the supply of cooking gas to over 330 million Indian domestic gas connection holders[54]. The situation is similar in respect of LNG, where all Indian LNG imports are transported on foreign-flagged vessels, primarily on long-term time charters arranged by Petronet LNG (with Qatargas), GAIL (with international counterparties) and other buyers. During the Hormuz disruption of March 2026, India had only days of LNG reserves in storage, dramatically highlighting the vulnerability created due to the lack of Indian flagged LNG vessels. To mitigate shortages, GAIL was forced to curtail gas allocations to industrial consumers and issue an emergency tender for a spot LNG cargo for delivery at ₹2.5x contracted rates[55]. Petronet LNG could not dispatch ships to Qatar as the Strait was effectively closed, and the company subsequently declared *Force Majeure*[56].

The lack of Indian flagged vessels to carry India's critical LNG and LPG imports reveals a serious strategic vulnerability. It needs to be addressed on a war footing to ensure India's energy security. It also means that India lacks control over freight pricing and availability, and vessel deployment during crises, such as the ongoing West

54 "Middle East Crisis: Two India-Bound LPG Tankers Crossing Strait of Hormuz | India News - The Times of India," accessed May 13, 2026, https://timesofindia.indiatimes.com/india/middle-east-crisis-two-india-bound-lpg-tankers-crossing-strait-of-hormuz/articleshow/129865382.cms.

55 "India's GAIL Seeks LNG Cargo for March Delivery, Say Industry Sources," Energy, Reuters, March 9, 2026, https://www.reuters.com/business/energy/indias-gail-seeks-lng-cargo-march-delivery-say-industry-sources-2026-03-09/.

56 "Petronet LNG Declares Force Majeure, Qatar Gas Supply Halts | Market News & Analysis," March 3, 2026, https://www.multibagg.ai/market-pulse/articles/petronet-lng-force-majeure-qatar-supply-cmmaxhoei0m8zmj0j4k4do6ia.

Asia conflict, is also exposed to sanctions and insurance regimes by external players. It is in this context that collaboration with established Nordic entities to build specialised LNG/LPG carriers becomes crucial for India.

Finland: Aker Arctic and Icebreaking Technology Finland is the global leader of polar ship design through Aker Arctic Technology, which has provided designs for 60 per cent of the world's icebreakers and many Arctic or Antarctic research and cargo vessels, as well as concepts for offshore structures and engineers the world's most advanced ice-going vessels[57]. Among others, it has designed the Russian *Arc7 Yamalmax*-class LNG tankers (displacement 130,000 tonnes, ice-breaking capability through 2.1-metre first-year ice at continuous speed) currently operating at Russia's Sabetta terminal on the Yamal Peninsula, as well as the *Aker ARC 130 A* diesel-electric icebreakers[58].

There are significant opportunities for the Nordic entities engaged in specialised ship design and construction to collaborate with Indian shipyards to synergise their expertise and Indian scale. Although there are already ongoing initiatives with Indian shipyards, currently holding 11 per cent of the Norwegian Shipowners 'Association (NSA)'s order book[59], there's a need for further expansion of orders. There are also significant investment opportunities available for Nordic entities under India's flagship *Sagarmala* programme and the $2.9 billion Maritime Development Fund, offering incentives across shipbuilding, ports, and logistics.

57 "Aker Arctic," Ship Technology, n.d., accessed May 13, 2026, https://www.ship-technology.com/contractors/bulkheads/aker-arctic/.

58 "Aker Arctic's Icebreaker Ship Design Projects Built in Russia - Ship Technology," accessed May 13, 2026, https://www.ship-technology.com/contractors/bulkheads/aker-arctic/pressreleases/icebreaker-design-built-russia/.

59 "India to Build First-Ever Polar Research Vessel (PRV) as GRSE Signs MoU with Norway's Kongsberg," accessed May 13, 2026, https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=2133528.

Space

Ground Space Station For obtaining data from the orbiting satellites, setting up a ground station at the poles offers an advantage wherein it enables polar-orbiting satellites to downlink data on almost every orbital pass (approximately 14 passes daily for Sun-synchronous orbits at 600-800 km altitude), compared to 2-3 passes for equatorial ground stations. This dramatic increase in data frequency provides near-real-time Earth observation capabilities critical for time-sensitive applications such as agriculture and weather forecasting. Currently, ISRO is operating Telemetry Tracking and Tele-Command (TTC) ground stations in Indonesia, Brunei and Mauritius and a remote sensing data reception station in Antarctica[60]. However, it does not have a ground station in the Arctic.

Ongoing space cooperation between India and Sweden relies on integration of remote sensing networks through the Swedish Space Corporation (SSC) Esrange Space Centre in Kiruna. In 2024, the SSC supported the Low Earth Orbit Positioning and Analytics Laboratory (LEAP-1) mission of India's Dhruva Space (a private space technology company). It has also provided critical telemetry tracking for ISRO's Chandrayaan-3 lunar mission[61]. This builds upon legacy collaboration beginning with the Swedish SARA (Sub-keV Atom Reflecting Analyser) payload on Chandrayaan-1 (2008), which mapped lunar surface volatiles and detected water molecules in lunar soil.

China's satellite tracking station at Kiruna, its first wholly owned overseas satellite ground station, became operational in 2016 and houses a 12-metre S/X/Ka-band antenna system for satellite

60 "FAQ - International Cooperation," accessed May 14, 2026, https://www.isro.gov.in/FAQ_InternationCooperation.html.

61 Philip, "SSC and Dhruva Space to Expand Ground Network Synergies," SSC Space, March 5, 2024, https://sscspace.com/news/ssc-and-dhruva-space-to-expand-ground-network-synergies/.

telemetry, tracking, and communications[62]. The facility reflects Beijing's growing strategic interest in Arctic space infrastructure, polar communications, and high-latitude satellite operations.

In 2020, Sweden denied Chinese access to SSC infrastructure due to security concerns after the Swedish Defence Research Agency (FOI) in 2019 warned that the Kiruna station in Sweden, while ostensibly for civilian use, could be used for Chinese military intelligence or surveillance[63].

Agricultural and Weather Applications For India, having a ground station at Kiruna will enable high-frequency downlinks from ISRO Earth observation satellites, including the Cartosat series providing 0.25-metre resolution panchromatic imaging, the Oceansat series for ocean colour monitoring, sea surface temperature, and wind vector scatterometry, and RISAT synthetic aperture radar satellites capable of all-weather, day-and-night imaging[64]. The resulting data will support granular weather forecasting, soil moisture tracking, and monsoon prediction models that directly affect agricultural productivity for India's 263 million agricultural workforce[65].

The India Meteorological Department's Monsoon Mission numerical weather prediction system integrates satellite-derived parameters such as total precipitable water, cloud-top temperature, and atmospheric motion vectors[66]. Enhanced temporal resolution through Kiruna downlinks will improve model initialisation for extended-

62 "Science Facilities," accessed May 13, 2026, https://en.ncsti.gov.cn/services/Resources/202502/t20250219_196084.html.

63 "-Swedish Space Agency Halts New Business Helping China Operate Satellites," China, Reuters, September 21, 2020, https://www.reuters.com/world/china/swedish-space-agency-halts-new-business-helping-china-operate-satellites-2020-09-21/.

64 "Earth Observation Satellites," accessed May 13, 2026, https://www.isro.gov.in/EarthObservationSatellites.html.

65 "Agrarian Land," accessed May 13, 2026, https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=1601902.

66 "PARLIAMENT QUESTION: Mission Mausam," accessed May 13, 2026, https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=2238025.

range forecasts of 10–30 days, which is critical for agricultural planning across India's 179.8 million hectares of net sown area[67]. In addition, soil moisture estimates derived through microwave radiometry using Soil Moisture Active Passive (SMAP) heritage algorithms applied to RISAT data will enable precision irrigation scheduling and drought early warning for major agricultural states such as Maharashtra, Karnataka, Rajasthan, and Madhya Pradesh, which together account for nearly 45 per cent of India's agricultural Gross Domestic Product[68].

Multilateral Data Sharing Through Global South Networks India's expanding space diplomacy, particularly ISRO-UAE Space Agency agreements for joint Mars and Venus missions, can utilise Kiruna as a multilateral data hub[69]. Additionally, India can utilise Swedish ground stations to act as an orbital data provider for other partner countries, consolidating a satellite data-sharing alliance across the Global South and aiding capacity-building programs under ISRO's 'Space Diplomacy' framework.

Environment

Norway: Marine Spatial Planning Framework Norway is a global pioneer in Marine Spatial Planning (MSP), having implemented comprehensive ecosystem-based management plans for the Barents Sea (2006), the Norwegian Sea (2009), and the North Sea/Skagerrak (2013). These frameworks balance competing demands from offshore hydrocarbon extraction, commercial fisheries, shipping routes, and ecological conservation by zoning human activities on the basis of dynamic ecological data, including spawning grounds,

67 "Agrarian Land."

68 https://www.isro.gov.in/media_isro/pdf/Publications/Diverse_Space_Applications.pdf

69 Siya, "India-UAE Space Deal and Its Transformative Benefits for Students," International Organization for Aerospace Education & Training, January 22, 2026, https://spacetrixaerospace.com/india-uae-space-deal/.

migration corridors, and benthic habitats[70].

Under the India–Norway Ocean Partnership, India is actively adapting the Norwegian MSP regulatory model to manage complex maritime domains. Pilot MSP projects are currently being developed for the Lakshadweep archipelago, comprising 36 islands spread across 32 square kilometres of land area, a 4,200 square kilometre territorial sea, and an Exclusive Economic Zone of nearly 400,000 square kilometres, as well as for the Puducherry coastal zone through the Ministry of Earth Sciences–Norwegian Environment Agency Integrated Ocean Initiative[71].

Building upon these pilot projects, the most significant future application of the Norwegian MSP model lies in the Sundarbans delta and the Gulf of Mannar. Spanning nearly 10,000 square kilometres across India and Bangladesh, the Sundarbans represent a highly sensitive ecological and economic zone requiring granular ecosystem-based spatial planning. Authorities need to balance competing demands arising from expanding commercial aquaculture, currently encompassing around 42,000 hectares of brackish water ponds producing nearly 1.5 million tonnes of shrimp annually, shared fish stocks with Bangladesh, tourism infrastructure development, and the preservation of critical mangrove ecosystems that support Bengal tiger habitats and migratory bird routes.

By applying Norwegian data-mapping methodologies combining bathymetric surveys, sediment analysis, hydrodynamic modelling, and ecological baseline studies, India can more effectively demarcate high-impact economic zones from ecological sanctuaries. Such an approach would strengthen biosecurity protocols, mitigate coastal erosion through mangrove buffer preservation, and support sustainable Blue Economy development.

70 Erik Olsen et al., The Ecosystem Approach the Ecosystem Approach, n.d.

71 "India and Norway Agree to Conduct Marine Spatial Planning in Lakshadweep and Puducherry," accessed May 13, 2026, https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=1702137.

Norway: Chemical and Plastic Waste Interception The bilateral INOPOL project (India-Norway Pollution Control) targets chemical and plastic waste management to protect marine environments. It seeks to address the interconnected challenges of marine litter, microplastics, and Persistent Organic Pollutants (POPs) in India. It supports India's broader objectives of reducing plastic pollution by generating science-based knowledge and strengthening local and regional capacities to prevent and mitigate the environmental threats posed by plastic and chemical pollution[72].

Building upon the INOPOL framework, India can scale these Norwegian methodologies across the Himalayan River systems, including the Ganga, Brahmaputra, Yamuna, and Indus tributaries, to track and intercept chemical runoff before it reaches the Bay of Bengal and the Arabian Sea. The Ganga River Basin, which supports nearly 43 per cent of India's population across 26 per cent of its land area[73], receives untreated industrial effluents containing heavy metals along its course, along with synthetic compounds that adversely affect downstream fisheries and coastal ecosystems. Norwegian monitoring protocols employing high-resolution gas chromatography–mass spectrometry and automated sampling stations could enable real-time contamination mapping and strengthen regulatory enforcement under the National Mission for Clean Ganga framework.

Clean Energy

Geothermal Energy Extraction Iceland is among the top 10 countries in the world in electricity generation from geothermal, with approximately 755 MW of installed geothermal electrical capacity

72 INOPOL – UNEP, n.d., accessed May 13, 2026, https://www.indianorwaymarinepollutioninitiative.in/?page_id=4975.

73 "Location-National Mission for Clean Ganga-INDIA," accessed May 13, 2026, https://nmcg.nic.in/location.aspx; Global Banking &. Finance Review®, "Sibur Increases LPG Shipments to India Amid EU Sanctions," Global Banking & Finance Review, June 17, 2025, https://www.globalbankingandfinance.com/UK-RUSSIA-LPG-EXPORTS-ae7f8de0-ccd3-4a89-8d5b-fab4a841c708/.

and nearly 1,900 MW of thermal capacity across 31 productive geothermal fields[74].

Bilateral India-Iceland efforts focus on harnessing India's 10.6 GW geothermal potential[75] through joint pilot initiatives, including the Puga Valley project (Ladakh, estimated 1-100 MW capacity)[76]. This provides a suitable foundation for expanding cooperation into commercially viable geothermal generation and district heating systems in high-altitude regions.

India could therefore pursue a phased cooperation model involving Icelandic technical support, joint geological surveys, and training programmes for Indian engineers through institutions such as the Iceland *GeoSurvey* and the United Nations University Geothermal Training Programme. A dedicated India–Iceland geothermal working group could also be established to identify commercially viable geothermal zones in Ladakh, Himachal Pradesh, Uttarakhand, and the Andaman and Nicobar Islands, while facilitating private-sector participation and green financing mechanisms.

Carbon Capture, Utilisation, and Storage Technologies The partnership also holds significant potential in Carbon Capture, Utilisation, and Storage (CCUS) technologies. Iceland's *CarbFix* project at Hellisheiði, which permanently mineralises carbon dioxide by injecting CO_2 dissolved in water into basaltic rock formations[77], offers an important technological model for India's decarbonisation efforts. India's vast Deccan Traps basalt formations, spanning nearly 500,000 square kilometres across Maharashtra, Gujarat, and

74 "Geothermal," accessed May 13, 2026, https://energycluster.is/renewable-energy/geothermal/.

75 "MNRE Steps Up Global Collaboration for Advancing Geothermal Energy in India," accessed May 13, 2026, https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=2200435.

76 www.ETEnergyworld.com, "IEW 2026: India and Iceland Explore Geothermal Projects, CCUS Tie-Ups," ETEnergyworld.Com, accessed May 13, 2026, https://energy.economictimes.indiatimes.com/news/coal/india-and-iceland-collaborate-on-geothermal-energy-and-carbon-management-innovations/127795863.

77 "Carbfix Tests Using Seawater to Mineralize CO2 at Helguvík, Iceland - Carbfix," accessed May 13, 2026, https://carbfix.com/newsmedia/carbfix-tests-using-seawater.

Madhya Pradesh[78], possess similar geological characteristics that could support large-scale CCUS deployment linked to coal-fired thermal power plants and industrial clusters.

India could explore pilot CCUS projects in collaboration with Iceland to support its Nationally Determined Contributions under the Paris Agreement while developing indigenous carbon sequestration capabilities. Preliminary discussions in this regard have already begun, providing a foundation for advancing cooperation and pilot-scale implementation[79].Bottom of Form

Investments

Nordic Institutional Capital The convergence of Nordic institutional capital and India's expanding infrastructure and manufacturing sectors creates a relatively de-risked environment for long-term Nordic investment in India. High pension participation and institutional savings in the Nordic countries have created large pools of long-term capital seeking stable, high-growth investments amid rising global uncertainty. Nordic sovereign wealth and pension funds collectively manage over two trillion dollars in assets, including the Government Pension Fund Global (GPFG) with assets exceeding USD 1.8 trillion, Denmark's ATP (Arbejdsmarkedets Tillægspension) managing nearly USD 140 billion, and Sweden's AP-fonderna pension funds collectively managing over USD 200 billion[80].

India is well-positioned to attract such investments in sectors such as green shipping, offshore wind energy, shipbuilding, green hydrogen,

78 "Deccan Traps - an Overview | ScienceDirect Topics," accessed May 13, 2026, https://www.sciencedirect.com/topics/earth-and-planetary-sciences/deccan-traps.

79 admin, "India and Iceland to Explore Geothermal and CCUS Projects," Power Line Magazine, February 2, 2026, https://powerline.net.in/2026/02/02/india-and-iceland-to-explore-geothermal-and-ccus-projects/.

80 Javier Capapé Aguilar and Drew Johnson, RESILIENCE AND GROWTH IN A NEW GLOBAL LANDSCAPE, n.d.

Arctic-capable maritime infrastructure, critical minerals processing, and defence manufacturing. Projects implemented under clear regulatory frameworks with sovereign oversight would offer Nordic investors the stability, transparency, and long-term returns sought by these pension and sovereign wealth funds.

The strong Environmental, Social, and Governance (ESG) mandates governing Nordic institutional capital further reinforce this alignment. Nordic funds are reallocating investments away from fossil-fuel-intensive sectors towards sustainable infrastructure and green technologies. The GPFG has divested from over 130 coal-related companies and committed itself to net-zero portfolio alignment by 2050, while Denmark's ATP targets a 70 per cent reduction in portfolio carbon intensity by 2030. Sweden's AP funds have similarly integrated climate-risk assessments and Paris Agreement compliance standards into their investment frameworks[81]. India could therefore establish a dedicated India–Nordic green investment platform and fast-track mechanisms to channel Nordic capital into commercially viable clean energy and maritime infrastructure projects.

Public-Private Partnership Investment Structures India could also develop a structured mechanism in which Nordic design and technology firms partner with Indian public and private sector entities through long-term partnerships. Such a framework would provide the scale, regulatory stability, and sovereign assurance required by Nordic pension and sovereign wealth funds for large-scale infrastructure investments. Priority sectors could include green port infrastructure such as the Deendayal Port, V.O. Chidambaranar Port, and Paradip Port, all of which are being developed as green hydrogen and ammonia hubs under the *Harit Sagar* framework, offshore wind projects under the National Offshore Wind Energy Policy 2024[82], and the indigenous construction of Ice-class vessels

81 https://www.climatepolicyinitiative.org/wp-content/uploads/1996/12/State-of-OECD-Pension-Funds.pdf

82 Offshore Wind | MINISTRY OF NEW AND RENEWABLE ENERGY | India, n.d., accessed May 14, 2026, https://mnre.gov.in/en/off-shore-wind/.

at Indian shipyards. These sectors, while requiring substantial investments, offer long-term and relatively stable returns backed by sovereign demand, regulatory support, and strategic national requirements.

Such cooperation would also contribute towards the development of a resilient and democratic Arctic supply chain that reduces excessive dependence on concentrated manufacturing ecosystems, particularly in East Asia. At present, Chinese shipyards account for more than half of global merchant ship production, while European and Indian shipyards together represent only a marginal share of global output. India could therefore work with Nordic partners to establish joint design, technology-transfer, and component manufacturing ecosystems for specialised Arctic-capable vessels, green maritime fuels, offshore energy systems, and dual-use maritime technologies, to diversify global supply chains.

Defence

NORDEFCO The Nordic Defence Cooperation (NORDEFCO) strengthens defence structures of Denmark, Finland, Iceland, Norway, and Sweden through common synergies and efficient common solutions across capability development, armaments, and operations[83]. Established in 2009, NORDEFCO's structure includes both political and military cooperation levels. It operates through five functional cooperation areas: capabilities, human resources and education, training and exercises, operations, and armaments[84]. Following Sweden and Finland's NATO accession (2023-2024), NORDEFCO represents a highly advanced, unified military bloc with combined defence expenditures exceeding $30 billion annually and 180,000 active personnel.

NORDEFCO conducts large-scale multi-domain exercises, including

83 "About NORDEFCO - Nordefco," accessed May 13, 2026, https://www.nordefco.org/the-basics-about-nordefco.

84 "About NORDEFCO - Nordefco."

Nordic Response (formerly Cold Response), which tests extreme cold-weather warfare, amphibious reinforcement operations, and joint air-land-sea integration in Arctic territories. Exercise *Noble Viking* (Iceland, 2024) demonstrated rapid reinforcement of Iceland through airlift and sealift operations, rehearsing NATO's ability to defend the GIUK Gap against submarine and surface threats.

The Nordic Defence Cooperation MoU permits cooperation with non-Nordic countries on the basis of pragmatic, needs-based assessments. Such cooperation may be initiated either at the political and ministerial level or through bottom-up military-to-military engagement, with participating members jointly determining the terms of cooperation for specific activities and projects[85].

Building upon the flexibility provided under the Nordic Defence Cooperation framework, India could consider structured and institutionalised military-to-military cooperation with the Nordic states. Such engagement could focus on anti-submarine warfare (ASW), cold-weather operations, maritime domain awareness, and logistics interoperability. Nordic navies possess extensive operational experience in shallow-water ASW within the highly complex acoustic environments of the Baltic and the Norwegian seas, where thermoclines and reverberation from rocky sea beds require advanced sonar processing and towed-array deployment techniques. These conditions closely resemble the acoustically challenging tropical waters of the Arabian Sea and the Bay of Bengal, making Nordic operational expertise directly relevant to India's shallow water ASW operations. The Indian Navy would significantly benefit from exposure to Nordic operational doctrines and training environments.

India could pursue a structured cooperation template broadly modelled on exercises such as MALABAR and VARUNA, including periodic joint naval exercises, Staff Talks, Arctic familiarisation deployments, and specialised ASW training in the High North. Such

85 "About NORDEFCO - Nordefco."

exercises would allow Indian naval personnel to gain experience in shallow-water ASW, ice-fragmented operating environments, extreme cold-weather logistics, crew endurance management, and NATO interoperability procedures. In return, India could provide Nordic forces operational exposure to tropical maritime conditions and littoral operations, carrier-based operations and amphibious operations.

This reciprocal engagement would strengthen India's multilateral naval engagements while simultaneously broadening NORDEFCO's operational familiarity beyond the North Atlantic theatre.

There's also potential for partnership with the Indian Army, which has extensive high-altitude and cold-weather operating experience in the Himalayas. Norwegian expertise in Arctic logistics and sustainment operations at sub-zero temperatures could provide valuable operational lessons for Indian deployments in Siachen Glacier and the Ladakh sector. Similarly, Finnish experience with winterised military equipment and cold-start procedures for armoured vehicles, artillery, and aviation assets could help address mechanical reliability challenges in Indian high-altitude military deployments.

Presently, except in Sweden, there is no defence wing in the other four Indian embassies in the Nordic States. A defence wing with a naval Defence Attaché could be started in Oslo, with accreditation to the other countries divided between Oslo and Stockholm. This could be subsequently expanded to a full-fledged defence wing with separate Army, Naval and Air attachés.

Conclusion

India-Nordic collaboration potential represents a highly synergistic partnership spanning maritime infrastructure, clean energy, environmental control, institutional capital mobilisation and defence cooperation. The convergence of Indian and Nordic objectives creates frameworks advancing bilateral, regional and global objectives.

Nordic states possess specific, high-value technological intellectual property and hold substantial sway within Arctic Council governance structures. India provides complementary capabilities necessary to actualise these technologies at scale, capital absorption capacity to fund its growing infrastructure and development needs, manufacturing bandwidth through state-owned and private enterprises, demographic capacity and political stability.

Deliverables from the realisation of the cooperation would include indigenous production of ice-capable vessels advancing India's energy security and polar research mission sustainability, real-time Earth observation data improving agricultural productivity and disaster early warning systems, ecosystem-based Marine Spatial Planning frameworks protecting India's coastal biodiversity while enabling Blue Economy development, institutionalised defence cooperation enhancing anti-submarine warfare capabilities and extreme cold-weather operational proficiency, and geothermal energy projects advancing renewable energy diversification targets.

Mrinank, currently interning at the Vivekananda International Foundation, assisted with the research.

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