B
NORGE P.P.
Returadresse:
Den Norske Atlanterhavskomité
Fr. Nansens pl. 6
0160 Oslo

DEN NORSKE ATLANTERHAVS KOMITE
THE NORWEGIAN ATLANTIC COMMITTEE

FOCUS NORTH **4-2007**

Figure 2 – Oil transport routes from the Russian North

© 2005 Ocean Futures Graphic design: UnParalleled, USA • GIS: Environmental Research & Assessment, UK

The Northern Maritime Corridor Ports Proposed pipeline routes

Figure 3 – Alternative shipping lanes along northern Norway

© 2005 Ocean Futures Graphic design: UnParalleled, USA • GIS: Environmental Research & Assessment, UK

Area of very high fishing activity

The Environment and Marine Transport

Produced by the research company Ocean Futures, Oslo for the Norwegian Atlantic Committee

Changes and opportunities

The sea ice regime in the Arctic Ocean is undergoing dramatic change. The ice edge is retreating northwards, the ice is becoming thinner and weaker, the occurrence of perennial ice along Russian coastal areas is diminishing, and deep-draft ice ridges are disappearing. In this manner the environment is changing. Meanwhile, these changes open up new possibilities for resource exploration, development, and marine transport in Arctic waters.

The Arctic as a new energy supplier

World energy production is in danger of declining dramatically in the years ahead. At the same time, global demand for oil is expected to increase considerably. The Arctic is one of several energy provinces which in the longer term can help compensate for some of the disparity between global supply and demand.

Several large sediment basins in the Arctic show great petroleum potential. Indeed, the United States Geological Survey thinks that 24 percent of the world's undiscovered petroleum resources may lie in the Arctic. At the same time, however, there remains great uncertainty regarding the extent of petroleum resources in the region.

In the opinion of Norwegian officials, the North could become Europe's most important petroleum province. Their optimism is based on the fact that considerable reserves of oil and gas have already been found in the Barents, Pechora and Kara Seas.

Norway's oil directorate estimates that some 830 million tons of oil equivalents await discovery on the Norwegian side of the Barents Sea, while Russia's energy ministry believes the Russian Barents Sea shelf contains 27.8 billion tons.

Today, petroleum production in the European Arctic is underway only on land—in Western Siberia and the Timan-Pechora oil province in northwest Russia. Production will soon go offshore, beginning with the Snow White (*Snøhvit*) gas field on the Norwegian shelf in 2006/2007 and the Prirazlomnoe oil field in the Pechora Sea in 2008, followed later by the giant Shtokman gas field.

The North is already becoming an important energy supplier to the West. In 2003, all of Russia's gas exports and 88 percent of its oil exports went to European customers. A considerable portion came from the Russian North, transported either southwards via pipeline or westwards via the Northern Sea Route, which connects Western Siberia with the Barents Sea (see Figure 1). A planned pipeline from Western Siberia to Murmansk will further strengthen the connection westwards.

The expected size of the Russian petroleum resources in the Arctic, combined with petroleum's dominating importance in the Russian economy, suggests that energy supplies from the Russian Arctic to the West has a long-term character. The Russian petroleum and shipping industries will in this regard receive help from a warming Arctic.

Increased access in a warming Arctic

The average annual temperature in the Arctic has increased about twice as much as in the rest of the world during the last decades. As the Arctic warms, the ice melts. Summer sea-ice coverage has shrunk 15 to 20 percent during the last 30 years. The ice is thinner and less concentrated, and the ice edge has retreated northwards. The average ice thickness in parts of the central Arctic Ocean has decreased from 3.1 meters to 1.8 meters since 1976.

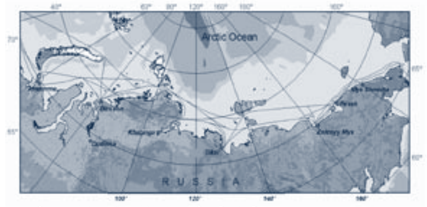
The ice cover is expected to shrink further in the years to come. The amount of perennial ice has declined by about 8 percent per decade, and the occurrence of deep-draft ice ridges is far less frequent. Some climate models predict that the Arctic could be ice-free during the summer time in the course of this century.

About FOCUS NORTH

This series of short fact sheets will cover current issues on developments in The High North. The first 10 issues are written by experts from Ocean Futures, www.ocean-futures.com The series can also be downloaded from the web, www.dnak.org

Editor: Marit Rye Ramberg
ISSN: 1502-6361

Figure 1 – The Northern Sea Route



Source: International Northern Sea Route Programme

The reduction improves the conditions for resource development and marine transport. This applies particularly in the Russian Arctic, where climate changes imply that a steadily greater part of the shallow continental shelf north of Siberia can be explored without sea ice acting as a barrier or hindrance to exploration activities. The ice which remains is thinner, weaker and easier to surmount.

Sailing conditions along the shipping routes from Western Siberia and westwards to the Barents Sea are becoming steadily better. The diminishing ice cover will gradually allow ships to sail farther north than the coastal zone and thereby avoid the shallow waters over the shelf and the narrow straits through the Russian archipelago.

Marine oil transport from the European Arctic

Marine transport of Russian oil through Norwegian coastal waters increased dramatically in 2002. The oil came from increased production in Western Siberia. As the existing pipeline from Siberia to southern Russia was oversubscribed, oil was instead shipped by train to the White Sea, transferred to tankers and shipped on to the European market.

Oil production in Western Siberia continues to increase. Russian oil companies plan to build a pipeline from Western Siberia to an export terminal in Murmansk to deal with the increased production in the long term (alternative routes are shown as the red and yellow dotted lines in Figure 2).

In the meantime, they have built a modern, ice-strengthened tanker fleet for shipping oil from the production fields in Timan-Pechora and Western Siberia to the export terminal in Murmansk. Crude oil, bunker oil and refined products are shipped out on small tankers to Murmansk, where it is transferred to large tankers for export. The transport capacity was originally about 5.4 million tons, but it is expected to triple or quadruple over a short period of time.

Oil is transported from the production fields via the Northern Sea Route and further southwards through the Northern Maritime Corridor, which stretches from the Barents Sea to the European continent (see Figures 1 and 2).

The trans-Atlantic route connects them on to the east coast of North America. In this way, Siberia is linked to Washington via two Arctic routes and a transoceanic seaway. Transport costs from Murmansk to North America are comparable to those from the Middle East. The first load has already been delivered to the United States, and this trade is expected to increase rapidly.

According to a recent UN report, oil production on the Russian shelf will be so large that oil transport in the Barents Sea will increase by a factor of six by 2020, or 32 million tons per year. Other analyses give higher export figures, from 36.5 million to 130 million tons per year in the course of 5 to 10 years. This equates to 365 to 1040 shiploads of oil each year. Thus at any given time, between three to nine tankers with Russian oil will be sailing off the Norwegian coast.

In addition will come some 70 shiploads of liquefied natural gas (LNG) generated by the Norwegian Snow White field, plus those generated by the giant Shtokman field, plus other fields that come into production on land and offshore. The Shtokman field, which will have an expected capacity of 14 million tons of LNG each year, could generate 225 shiploads of LNG annually.

The higher shipping estimates are dependent upon deliveries from Western Siberia. These estimates are only realistic if a pipeline is built from Western Siberia to an export terminal at the Barents Sea. Development plans for Western Siberia thus have direct relevance for marine oil transport through the Norwegian part of the Barents Sea and southward along the Northern Maritime Corridor.

Although considerable uncertainty is attached to estimates of freight volume and sailing frequency, they indicate the likelihood of significant, long-term resource development activity in the Barents Sea. From the Norwegian side, this demands action in relation to both the challenges and the opportunities that these activities present.

Environmental challenges and possible political responses

Norwegian politics on development in the Barents Sea

There is agreement in Norway that development policy in the Barents Sea will be green; that is to say, that development be conducted within strict environmental limits. The disagreement centres on how green the policy should be: dark green, medium green or light green.

The recent comprehensive Management Plan for the Barents Sea lays the ground for balancing different interests, including fishing, petroleum, and tourism. Development must occur within sustainable limits that maintain biological diversity and ensure pristine nature areas and cultural monuments are not exposed to appreciable encroachment or influence. Some areas will be opened to petroleum exploration, while others will remain closed. Norwegian policy thus allows controlled exploitation and transport of petroleum resources given that protection interests are attended to and given priority. The policy is medium green.

Industry has long realized that environmental protection is a door-opener for exploitation. This implies that every serious economic actor includes environmental protection in its planning. However, protection is a cost issue. Industry supports a light green policy with emphasis on economic criteria within an acceptable protection level.

The environmental movement stands for the dark green variant. It promotes preservation and use of the living resources in the region, giving petroleum a limited place. Their preference is to set up petroleum-free zones in sensitive marine areas.

Limited ability to regulate Russian activities

The transport of Russian oil and gas, meanwhile, is independent of the development debate on the Norwegian side of the Barents Sea. The same applies to exploration and production activities on the Russian side. Here Norway must partly adapt itself to the situation and partly carry out efforts which can reduce the potential for damaging effects.

The majority of Russian oil transport will occur within Norway's 200 nautical mile Exclusive Economic Zone (EEZ). This sailing is lawful. Under the 1982 Convention on the Law of the Sea, a coastal state has a limited right to regulate passage through the EEZ, but cannot prohibit or prevent it. A coastal state may enact regulations to prevent or minimize damage from shipping if passage threatens particularly vulnerable areas, as discussed below.

Norwegian interests can also be affected by incidents outside of its EEZ. This includes petroleum activities on the Russian Barents Sea shelf. Here, Norway has no regulatory authority and can only insist that activities be conducted within accepted international rules and standards.

Norway has taken a number of independent steps to improve oil spill prevention and preparedness in the North. This includes improving towing and salvage capabilities for tankers in distress, increasing the amount of oil spill clean-up equipment, and establishing a system to monitor vessel traffic along the coast.

Other measures are dependent on international cooperation, and are discussed further below.

Particularly Sensitive Sea Areas (PSSA)

In 2003, the Norwegian government announced that it will seek to designate the most vulnerable parts of the Barents Sea as Particularly Sensitive Sea Areas (PSSA). A PSSA is a marine area which requires special protection because of its ecological, socio-economic or scientific significance, and which is vulnerable to activities from international shipping.

The Law of the Sea authorizes states to designate PSSAs with the approval of the International Maritime Organization (IMO). Appropriate protective measures may then be enacted within the EEZ, such as routing shipping traffic outside vulnerable areas, setting speed limits, obligatory pilotage, special construction requirements for ships, etc.
Before the IMO will grant an area PSSA status, the requesting state must document and justify that the area's vulnerability is associated with shipping, that the potential damage is ecological, socio-economic or scientific in nature, and that the IMO has suitable measures to protect the area. These are demanding standards that may require significant research to meet the documentary requirements, and even new international regulations to find appropriate protective measures.

To date, the IMO has awarded eleven areas PSSA status, including Australia's Great Barrier Reef.
Portions of the Barents Sea are considered deserving of protective status because they contain nature of great and even unique value. The Barents Sea is home to the world's largest stocks of cod and herring; some of Europe's largest colonies of sea birds; rare whale species; and rich plankton stocks that are the basis of several food webs. Lofoten has the world's largest coldwater coral reef.

PSSA designation is not controversial in principle. The potential for disagreement lies in an area's size and scope. Nevertheless, there is broad agreement that PSSA status is a valuable tool for protecting vulnerable areas, where shipping can and should exercise due caution.

Vessel traffic management and shipping lanes

To improve safety along the coast, Norway has taken a decision to build a vessel monitoring system. The monitoring centre in Vardø will conduct 24-hour surveillance, and will be operational from 2007. By integrating coastal radar stations with the Universal Shipborne Automatic Identification System (AIS), the centre will have the capacity to monitor shipping traffic along the entire coast of northern Norway, as well as coordinate the operation of towing and salvage vessels to assist ships in distress (see Fact Box 1).

In a related initiative, Norway is also seeking IMO approval to establish compulsory sailing lanes outside its territorial sea along the coast of northern Norway. Shipping lanes are an effective measure for improving the orderly, expeditious and safe transit of ships. By directing ships farther offshore and separating them in designated lanes, they reduce grounding and collision risks, which in turn reduce the risk of oil pollution incidents.

The ability to monitor shipping traffic can be an important – and limiting – factor in deciding how far offshore to locate shipping lanes. If the lanes are to be monitored, they must be placed inside the range of the monitoring systems. In the case of an integrated AIS and coastal radar system, as Norway is establishing, this would be within 20 to 35 nautical miles from the coast. Radar satellites could extend coverage offshore, but existing satellites give only periodic coverage of once or twice a day—inadequate for 24-hour surveillance.

Figure 3 shows two hypothetical shipping lanes along northern Norway. The first is 12 nautical miles offshore, within the territorial sea. Although Norway could establish such a shipping lane without IMO approval, it would not route ships away from areas of highest fishing activity.

The other lane is located 30–35 nautical miles offshore. It lies within the surveillance of coastal radar, but at the outer ability of AIS monitoring. A shipping lane at this distance would allow major shipping traffic to avoid some, but not all, areas of most intense fishing activity.

Barents Sea environmental agreement

The Barents Sea constitutes a single ecological unit. It does not help to have good prevention and preparedness measures on the Norwegian side without comparable measures on the Russian side. Responsible management of the entire Barents Sea is therefore dependent upon cooperation with Russia and others.

A constructive proposal in this regard is to conclude a bilateral or multilateral agreement that sets high environmental standards for managing and conducting activities in the Barents Sea. Such a convention could serve as a model for similar agreements in other parts of the Arctic.

The initial proposal called for concluding a bilateral treaty, then opening it for other parties to join. This process has the advantage of ensuring that the environmental premises are defined by the two coastal states having jurisdictional authority and responsibility in the Barents Sea.

Fact Box 1 – Universal Shipborne Automatic Identification System (AIS)

AIS is a shipboard communication system that will send ship information such as identification, position, course and speed, size, cargo type, origin, destination, etc. to other ships and to authorities ashore.

AIS uses a transmitter installed on the ship. The transmitter operates in the VHF marine radio band, which has a range of 20–35 nautical miles for ship-to-shore communications. By establishing a VHF receiving chain along the coast for AIS signals, a coastal state can use the information from the vessels to monitor marine traffic in its home waters.

AIS is a new element under the Safety of Life at Sea (SOLAS) convention. The system is being phased in between 2002 and 2008. AIS is required for:

- All passenger ships;
- Cargo ships of 500 gross tons or more on domestic voyages; and
- All ships of 300 gross tons or more on international voyages.

Naval vessels and state-owned vessels are not required to be outfitted with AIS.

Summarized from "The Environment and Marine Transport in the North" (12/2005), available (in Norwegian) at ocean-futures.com

Maps with full colour version are available at www.dnak.org

Hegland trykkeri a.s