

# Oxford Energy Comment

## August 2007

---

### **The Battle for the Next Energy Frontier: The Russian Polar Expedition and the Future of Arctic Hydrocarbons**

By Shamil Midkhatovich Yenikeeff and Timothy Fenton Krysiek\*

Energy markets are in a state of flux. The high price of oil and gas, instability in the energy-producing regions, surging demand in the Asia-Pacific region, and reserve depletion in the OECD zone, has made both consuming and producing nations highly sensitive to developments that could challenge their position on the global energy scene.<sup>1</sup> Declining onshore reserves will force resource-rich nations to develop undersea oil and gas hydrocarbons. According to some forecasts, roughly 40 percent of global oil and gas will be produced offshore by 2015.<sup>2</sup> The dynamics of the global energy industry explain why Russia's recent polar expedition made international headlines. Moscow's objective was to assert its claim to the vast natural resources of the Arctic Ocean. By 2030–2040 global warming will melt enough of the polar ice cap to make the extraction and transportation of undersea oil and gas possible. Most of the Arctic thaw is taking place in Russia's territorial waters and the Russian Northern Sea Route will probably be open to commercial shipping in 2025–2030.<sup>3</sup>

These developments have the potential to seriously impact the global energy scene, especially in terms of investment and technology distribution in upstream and downstream activities and the delivery of oil and gas resources to markets. This paper assesses the implications of Russia's Arctic expedition in late July–early August 2007 and identifies the key factors that will determine the future of Arctic hydrocarbon development.

#### ***Russia's Arctic Potential***

The entire Russian continental shelf covers 6.2 million square kilometres. Russia's extractable offshore hydrocarbon resources are approximately 100 billion tonnes, 80 percent of which are located in the Arctic. The key problem with estimating the true potential of Russian offshore hydrocarbons is the fact that geological data, on most features, covers only about 9–12 percent of the territory.<sup>4</sup> The only well studied offshore area is the western part of the Arctic, which accounts for 75 percent of all discovered Russian offshore hydrocarbon resources.

Various sources have offered diverse forecasts of the potential of Arctic hydrocarbon reserves. In *Future of the Arctic: A New Dawn for Exploration*, Wood Mackenzie and Fugro

---

\* Dr Shamil Midkhatovich Yenikeeff is a Research Fellow at the Oxford Institute for Energy Studies and a Senior Associate Member at the Russian and Eurasian Studies Centre, University of Oxford. Timothy Fenton Krysiek is a Visiting Research Fellow at the Oxford Institute for Energy Studies and is a Marshall Scholar at the Russian and Eurasian Studies Centre, University of Oxford. The contents of this paper are the authors' sole responsibility. They do not necessarily represent the views of the Oxford Institute for Energy Studies or any of its Members.

Robertson take a rather cautious approach and estimate the Arctic share of global hydrocarbon potential at 29 percent of undiscovered gas and 10 percent of oil.<sup>5</sup> The study asserts that yet-to-find (YTF) Arctic resource pools total 166 boe (billion barrels of oil equivalent) while already discovered resources make up 233 billion boe.<sup>6</sup> At the same time, *Future of the Arctic*, argues that Arctic reserves predominately contain gas. Gas constitutes 85 percent of the discovered resources and 74 percent of the YTF potential.

The U.S. Geological Survey and the Norwegian company Statoil share the more optimistic view that the Arctic holds 25 percent of global undiscovered hydrocarbon resources.<sup>7</sup> In a similar manner, the Russian Ministry of Natural Resources states that the Russian part of the Arctic contains around 80 billion tonnes of hydrocarbon deposits or 586 billion boe. If Moscow is successful in its bid for more Arctic territories, its hydrocarbon share could increase by at least 10 billion tonnes (73.3 boe) or two-thirds of the global annual energy consumption.<sup>8</sup> Some Russian experts also argue that future exploration of the Arctic could result in the discovery of further large hydrocarbons resources.<sup>9</sup>

Whatever the true potential of the Arctic, most experts, including Statoil, Wood Mackenzie and Fugro Robertson, agree that Russia will dominate the production of Arctic hydrocarbons because approximately 69 percent of Arctic reserves belong to Russia.<sup>10</sup> According to the Wood Mackenzie/Fugro Robertson report, Russia will play a dominant role in Arctic gas, accounting for three-quarters of peak production.

### ***Arctic Resource Survey***

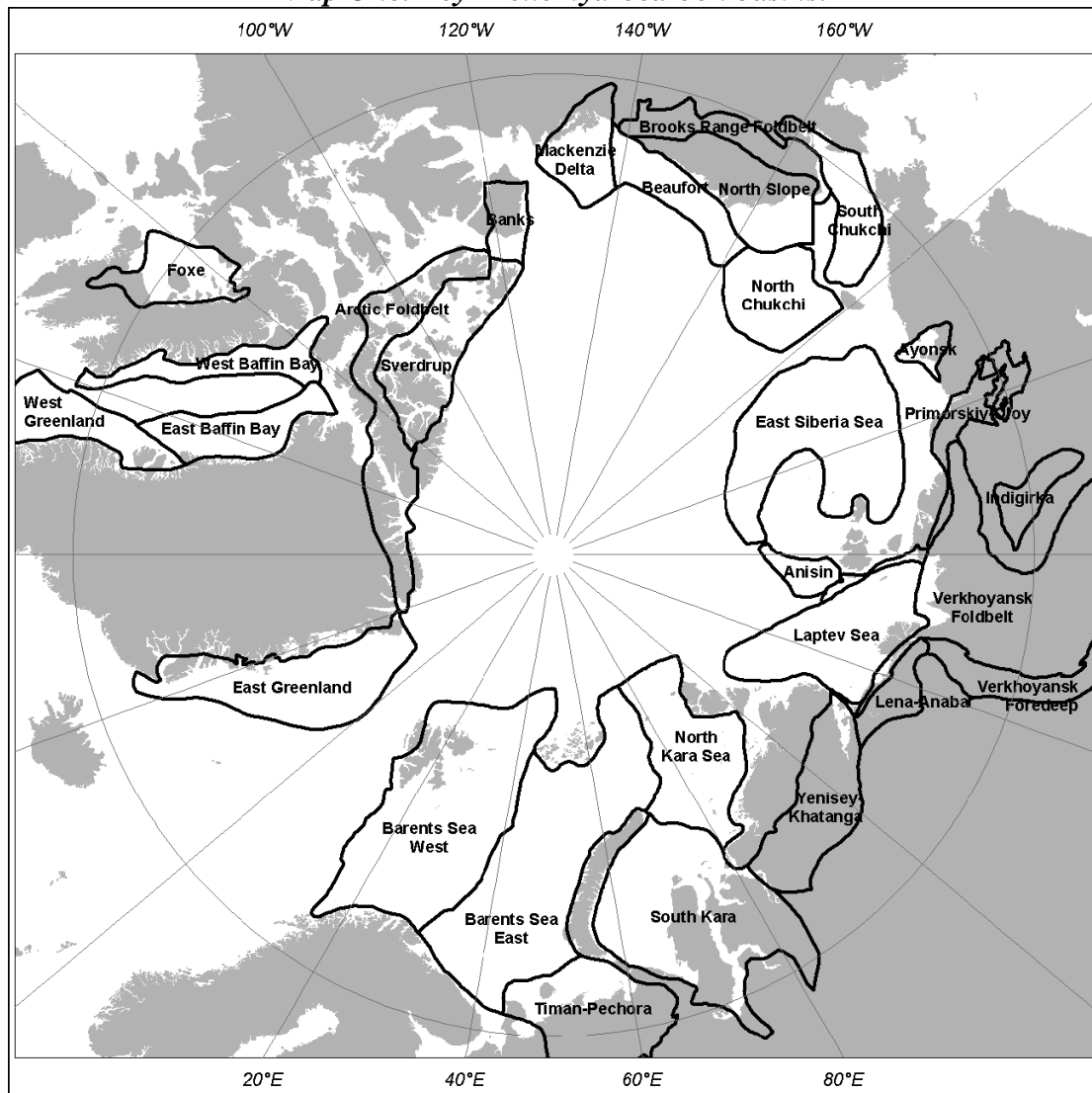
The size of the Arctic shelf is approximately 4.5 million square kilometres. The Arctic Ocean is subdivided into several bodies of water, including the Barents, Kara, Laptev, East Siberia, and Chukchi Seas and their adjacent waterways.

The western part of Arctic Russia is considered to be one of the federation's most important future oil and gas provinces, containing about 8.2 billion tonnes of hydrocarbons. Thus far, significant oil and gas reserves have been discovered in the Barents, Pechora and Kara Seas and in the Timan–Pechora basin. The Barents Sea includes Shtokman gas and condensate field (3.2 trillion cubic meters of gas and 31 million tonnes of gas condensate) and Prirazlomnoye oil field (about 610 billion barrels of oil). Russia's state-owned gas company, Gazprom, controls both fields.

The Kara Sea basins also possess a substantial hydrocarbon potential. They include the massive Russanov and Leningrad gas and condensate fields, each of which may contain more hydrocarbons than the giant Shtokman field.<sup>11</sup> In the coming decades, oil and gas production from these areas is expected to grow as production declines in traditional Russian hydrocarbon regions, such as the Volga and Urals. Altogether, the western part of the Arctic contains 18.4 percent of Russia's oil reserves and 7.6 percent of its gas. Total regional reserves of crude oil, gas-condensate and natural gas are estimated at 53.3 billion barrels of oil equivalent.<sup>12</sup> Despite the region's great promise, the Timan–Pechora basin, which includes the Nenets AO and parts of the Archangelsk Region and the Komi Republic, is the only part of Barents Russia currently producing oil and gas.

The East Siberia and Laptev Seas include several basins, some of which are offshore extensions of the Vilyuy gas basin and may contain further hydrocarbon resources.<sup>13</sup> Minor oil and gas deposits have been discovered in the onshore territories near the Bering Sea, indicating that there may be more hydrocarbons in the adjacent seabed. However, due to the severe climate, this area has not been properly explored.

*Map One. Key Arctic hydrocarbon basins.*



Source: Kristin Rønning and Geirr Haarr, *Exploring the Basins of the Arctic*, Statoil ASA, 2005 ([http://www.cge.uevora.pt/asp02005/abscom/Abstract\\_Lisbon\\_Ronning.pdf](http://www.cge.uevora.pt/asp02005/abscom/Abstract_Lisbon_Ronning.pdf)).

In addition to the Russian areas, offshore Arctic regions belonging to Denmark and the United States also have an interesting hydrocarbon potential. This is especially true of the Kronprins Christian basin off Eastern Greenland which has prospective resources of over 10 billion barrels of oil equivalent.<sup>14</sup> The northern shelf of Alaska alone contains about 6 billion barrels. The beginning of production from the National Petroleum Reserve Alaska (NPR) in 2007 is projected to increase Alaskan oil production from 830,000 bpd to 900,000 bpd by 2014. Alaskan production is projected to decline thereafter, but if the Arctic National Wildlife Refuge (ANWR) is opened for exploration and production it could stabilize America's Arctic oil output.<sup>15</sup>

Overall, Wood Mackenzie and Fugro Robertson predict that by 2030 Arctic hydrocarbon production will reach 10 million boed. Russian experts contend that gas production in the region will total around 800 million cubic meters of natural gas per day (more than half of the current rate of gas production in Russia).<sup>16</sup>

### ***Russia's Arctic Strategy***

The Russian expedition to the North Pole highlighted the uncertain legal status of the Arctic region. Five countries—Russia, the United States, Canada, Norway and Denmark (by virtue of its control over Greenland)—claim sovereign territory within the Arctic Circle. According to the United Nations Convention on the Law of the Sea (UNCLOS), states are entitled to an exclusive economic zone (EEZ) of 320 nautical kilometres (200 nautical miles) beyond their coastline. A coastal state has the exclusive right to exploit all natural resources within its EEZ, including subsoil hydrocarbon resources. If a state can prove to the UN Commission on the Limits of the Continental Shelf that its undersea shelf extends beyond its EEZ, it has the right to exploit that seabed's resources. Russia claims that the Arctic Ocean seabed is a projection of the Siberian continental platform. The Kremlin has petitioned the UNCLOS committee on continental shelf boundaries to recognize Russia's exploration rights to over 1.2 million square kilometres (460,000 square miles) of Arctic undersea territory, including the Lomonosov Ridge and Mendeleev Ridges. Thus far, the committee has denied the Russian request. A primary objective of Russia's recent Arctic expedition was to gather scientific evidence to support Russia's territorial claims.

The exploration and development of new offshore resources in the Arctic could present Russia with a vital opportunity to boost its gas and oil reserves. This is important given the projected decline of Russian gas output from existing fields from 545.1 bcm in 2004 to 344 bcm in 2020.<sup>17</sup> In terms of oil, Russia remains the world's second largest producer after Saudi Arabia, however, its proved oil reserves are estimated at just 79.5 billion barrels, while the Saudi reserves are 264.3 billion barrels.<sup>18</sup> For this reason, potential Arctic oil reserves could prove highly valuable to the Russian oil sector.

### ***Circumpolar Reaction to the Russian Expedition***

Russia's Arctic expedition appeared to catch U.S., Canadian and Danish officials by surprise. The voyage has sparked a chain reaction of expeditions from other circumpolar states. Over the past two weeks, Washington, Ottawa and Copenhagen have reiterated their Arctic claims and recalibrated their regional strategies and capabilities. The Russian expedition to the North Pole has elevated the importance of Arctic issues in each of the littoral states. In the coming months, regional governments will attempt to enhance their presence in the Arctic through further scientific expeditions and military manoeuvres and by investing in icebreakers and geological surveys.

The U.S. government's reaction to the Russian expedition reveals Washington's indecision over its arctic strategy. Since 1982, the U.S. Senate has failed to ratify the U.N. Convention on the Law of the Sea. The Bush administration supports the treaty but has not yet been able to rally the votes necessary to ensure its ratification. John Bellinger, the State Department's senior legal counsel, recently claimed that if the U.S.A. ratified the law, it could claim sovereignty over 600 miles of seabed off the Alaskan coast and exert diplomatic influence on the Convention committee responsible for determining continental shelf borders. Support for the Law of the Sea appears to be growing in the Senate. Russia's recent Arctic expedition has presented the Bush administration and other proponents of the Law of the Sea with a valuable political opportunity to push for the treaty's ratification.

Just days after the Russian explorers planted a flag on the Arctic seabed, the United States government launched its own expedition. On 6 August, the U.S. Coast Guard icebreaker Healy left Seattle for the Bering Sea. According to government officials, the Healy's mission is to study global warming and its consequences for the region. The Healy is one of just four operational U.S. government icebreakers and it is the only ship in the fleet

that is routinely able to complete its missions. The Coast Guard's scramble to find a seaworthy ship capable of sailing to the Arctic on short notice has drawn further attention to the critical condition of the U.S. icebreaking fleet. A growing number of U.S. representatives and senators are backing legislation to increase funding for U.S. Coast Guard icebreakers and expand the size of the fleet. Russia's recent Arctic manoeuvres have exposed the weaknesses in U.S. Arctic strategy, but they are likely to bolster congressional support for the Law of the Sea and increased Coast Guard funding.

*Map Two. Russia's Arctic Claim.*



- 1) North Pole:** Russia leaves its flag on the seabed, 4,000m (13,100ft) beneath the surface, as part of its claims for oil and gas reserves
- 2) Lomonosov Ridge:** Russia argues that this underwater feature is an extension of its continental territory and is looking for evidence
- 3) 200-nautical mile (370km) line:** Shows how far countries' agreed economic area extends beyond their coastline. Often set from outlying islands
- 4) Russian-claimed territory:** The bid to claim a vast area is being closely watched by other countries. Some could follow suit.

Source: <http://news.bbc.co.uk/2/hi/europe/6927395.stm>

The Russian expedition to the North Pole provoked a passionate response from several Canadian leaders. Prime Minister Steven Harper has continually stressed the need to use military power to protect Canada's Arctic interests; he toured the Northwest Territories and Nunavut in the days following the Russian expedition. Foreign Minister Peter MacKay immediately dismissed Russia's polar expedition as a meaningless gesture and stated that

Canadian sovereignty over the Arctic was longstanding and well established. The political fallout in Canada over the Russian expedition prompted the government to launch a 'sovereignty operation' known as Operation Nanook in the Canadian Arctic on 7 August. Nanook consisted of two surface ships, a submarine and 700 military personnel performing manoeuvres in Nunavut, Frobisher Bay, Hudson Strait and Davis Strait. The Harper government's swift reaction to developments in the Arctic reflects the increasing importance of Arctic issues in Canada. During the 2006 federal election, Harper and the Conservative Party outlined a multi-point plan to protect the Northwest Passage and energy resources in the Far North. The strategy included three new icebreakers capable of transporting hundreds of military personnel, a deep-water Arctic port for military and commercial use, new military bases in the region and a Arctic National Sensor System capable of detecting foreign submarines and surface ships. In July, the Prime Minister announced that the government would purchase six to eight armed patrol ships for the Navy to patrol Canada's territorial waters. In addition to physically defending its waters, Canada must act quickly to defend its legal claims to Arctic territory. Under the terms of the UNCLOS, Canada has until 2012 to submit scientific evidence to support its claims to the continental shelf. However, given the poor condition of its icebreaking fleet, the government may be forced to hire foreign icebreakers to support its fact-finding operations. Harper has long championed Canada's Arctic claims and continually cited the enormous potential value of the natural resources that lie beneath Canada's icy northern waters. As the scramble for Arctic hydrocarbons intensifies, the Harper government will be quick to defend Canada's interests.

In response to Russian, American and Canadian actions, the Danish government launched an Arctic expedition on 12 August. A multinational team of 40 scientists, including 10 Danes, set sail from the Norwegian island of Svalbard for the North Pole aboard the Swedish icebreaker Oden. The government instructed the Danish scientists to gather evidence that the Lomonosov Ridge is an underwater extension of Greenland, rather than Russia. Expedition leader Christian Marcussen confirmed that the research would be used to support Denmark's territorial claims in the Arctic. Denmark is likely to continue its scientific research in the region; it may also respond to recent Canadian military manoeuvres with its own show of force. In recent years, Denmark and Canada have both launched military missions to plant their flags on tiny Hans Island, an uninhabited knoll strategically located in the middle of the Nares Strait, the waterway that links Baffin Bay and the Arctic Ocean. Hans Island is likely to re-emerge as a flashpoint in Arctic geopolitics in the near future.

Thus far, the Norwegian government has been conspicuously absent from the international dispute over Arctic territory, due in large measure to Norway's ongoing cooperation with Russia over offshore hydrocarbon development in the region. The emerging strategic relationship between Oslo and Moscow over regional oil and gas development helps to explain the Norwegian government's muted reaction to Russia's recent polar expedition. Since 2002, the Norwegian and Russian governments have signed a series of declarations outlining Norway's role as Russia's strategic partner in Arctic hydrocarbon development. Norwegian companies Statoil and Norsk Hydro have 35 years of experience drilling wells in extreme conditions in the northern continental shelf. Norwegian expertise and capital could prove extremely valuable to Russian state champions Rosneft and Gazprom as they proceed with offshore development projects in the Arctic.

### ***Potential Beneficiaries of the Arctic Energy Frontier***

Today, national oil companies (NOCs) control almost 80 percent of global oil and gas reserves. This has forced international oil companies into a fierce competition with one

another for the development rights to increasingly scarce hydrocarbon reserves. As a result, resource-rich nations generally enjoy considerable leverage in choosing partners or service companies for their oil and gas projects. However, in the case of the Arctic hydrocarbon development, Russia and the other circumpolar nations will be forced to choose from a handful of companies with the technological expertise and sub-Arctic experience necessary to extract oil and gas from the Arctic seabed. The Russian state energy champions, Gazprom and Rosneft, have limited experience with such complicated and remote projects. It is uncertain how rigorous Arctic exploration and production will be, but there are a few companies that have demonstrated the basic competencies necessary to tackle Arctic offshore hydrocarbon projects.

The Norwegian firms Statoil and Norsk Hydro have unsurpassed experience developing offshore resources and are leaders in the relevant technologies. Both companies have been successful in utilising new technologies in severe climates, while remaining sensitive to environmental concerns. Through the Snøhvit and Ormen Lange projects, Statoil and Norsk Hydro have developed the skills and technology necessary to successfully drill in the Arctic.<sup>19</sup> Despite the differences in climate and geological conditions between the Norwegian and potential Russian projects, the Norwegians have the potential to adjust their operations for hydrocarbon ventures in the Arctic.

In addition to the Norwegian firms, the Anglo-American supermajors are well positioned to benefit from Arctic energy development. Exxon, BP and Shell each have experience operating high-technology projects in extreme northern conditions. Among these firms, Exxon arguably holds the best position. Exxon has proven itself a competent operator of the Sakhalin-1 oil and gas project in the Russian Far East. Despite strong upstream inflationary pressures, the Exxon-led project at Sakhalin-1 has proceeded more or less on time and at a relatively reasonable cost. Furthermore, Exxon has developed a strong working relationship with Rosneft, one of the two Russian state-owned firms with exclusive offshore development rights in the Arctic. Exxon also enjoys a strong presence in Alaska and northern Canada through its gas projects at Prudhoe Bay, Point Tompson and the Mackenzie Delta and its oil operations at Cold Lake and the Kearl tar-sands. No one can predict just how difficult Arctic exploration and production will be, but Exxon's strong financial position, technical know-how and extensive experience operating in sub-Arctic conditions make it a strong candidate to take on future projects farther north.

Like Exxon, Shell and BP have experience managing complex projects in challenging cold-weather conditions. Shell is a major player in the Athabasca oil sands project in northern Alberta and, until recently, the Anglo-Dutch major managed Sakhalin-2, the largest integrated oil and gas project in the world. BP has been a prominent player in Alaska for decades and it has invested heavily in Western Siberia and Sakhalin. Despite their considerable familiarity with complicated sub-Arctic projects, each company has experienced difficulties political and technical difficulties with their northernmost ventures in recent years. Shell's reputation in Russia is still tarnished by the cost overruns and environmental violations that occurred during its tenure as operator of Sakhalin-2. BP's environmental infractions in Alaska have been the subject of U.S. criminal investigations and TNK-BP recently lost a showdown with the Kremlin over the development rights to the Kovykta gas field in Eastern Siberia. Over the past year, Shell and BP have attempted to reinforce their positions in Russia by announcing major partnerships with Rosneft. Shell is also fighting in U.S. federal court to drill exploratory wells in Alaska's Beaufort Sea. Despite their recent political difficulties, Shell and BP have the potential to implement Arctic hydrocarbon projects over the long-term.

### ***Challenges to Arctic Development***

At present, Russia's offshore operations only add up to 0.5 percent of the total domestic oil production.<sup>20</sup> By 2020, Russia's strategy on continental shelf development seeks to increase the offshore share in domestic oil and gas output to 20 percent. The Arctic will play a key role in this process. The main question here is whether Russia is capable of active development of the Arctic with its severe polar climate and vulnerable habitats in the foreseeable future. In this respect, the key obstacles include the lack of relevant experience and technologies, virtual absence of all essential industrial equipment and vital infrastructure in the Arctic regions, a problematic regulatory regime and the fiscal environment.

#### Geological data

The lack of geological data in the Russian section of the Arctic is a serious problem. Most of the current hydrocarbon resources in the Russian part of the Arctic, such as the Shtokman and Prirazlomnoye fields, were discovered by Soviet geologists in the late 1970s and the 1980s. After the collapse of the USSR in 1991, the Russian federal government ceased state funding of geological expeditions. As a result, in early 2007, the Russian part of the Arctic contained only 58 wells, whereas the Norwegians had already drilled about 1,500 wells in their section.<sup>21</sup>

Today, Russia's strategy on continental shelf development seeks to boost geological work in the Arctic through a combination of public and commercial financing with the bulk of financing coming from corporate entities. Recently, the Russian government planned to introduce a number of measures to encourage offshore exploration by allowing the finders of new hydrocarbon reserves to claim exploration rights without an auction. These plans, however, may have been shelved due to Moscow's intention to assign exclusive offshore exploration rights to the Kremlin-controlled companies, Gazprom and Rosneft.

Nevertheless, international oil companies are likely to get involved in joint exploration ventures with Russian partners. In July 2007 Rosneft's president Sergei Bogdanchikov stressed that his company is likely to honour the 'memorandum of understanding' reached with BP in 2006 on joint exploration of the Arctic.<sup>22</sup> Although so far the memorandum has not resulted in any concrete mechanisms for BP's involvement in Rosneft's ventures, the supermajor could get up to 49 percent in the joint partnership.

#### Technology and infrastructure

When the time comes to develop the technology and vital infrastructure for its Arctic hydrocarbon ventures, Russia will have two choices: either to do most of the required work on its own, or to invite foreign partners on board. Domestic development of new technologies could considerably increase costs and reduce the competitiveness of Russian Arctic projects, but in the long run could boost socio-economic development in the adjacent regions. The military industrial complex, which is involved, for example, in the modernisation of platforms for the Russian oil and gas industry, could also benefit.

By 2020, according to Rosneft's estimates, Russia's offshore projects that are already in existence will require 49 platforms.<sup>23</sup> At the moment, it is unclear whether Moscow is capable of developing these on its own, especially if one takes into account, that currently Gazprom is using Norwegian-built drilling equipment on its Shtokman field.

#### Investments and taxation.

The cost of developing both offshore and onshore hydrocarbon reserves in the Russian Arctic is particularly high. Tapping the oil and gas reserves of the greater Barents region alone will



require total capital investments of about \$65 billion—\$5 billion for geological surveys, \$50 billion for exploration and development, and \$10 billion for vital infrastructure, such as export pipelines and port facilities.<sup>24</sup> However, it is important to remember that these figures are just initial estimates. The price of implementing Russian Arctic projects could well skyrocket as happened with Sakhalin-2 and the Norwegian Snøhvit project.

According to the Russian Ministry of Natural Resources the high costs of Arctic exploration and expenditures on prospecting will be compensated by massive volumes of hydrocarbons. Some experts value the Russian Arctic resource potential as high as \$7 trillion.<sup>25</sup> However, these estimates are made under current oil and gas price conditions. In this respect, the future of the Arctic shelf development will be determined by the dynamics of world oil prices in the next twenty years. However, future prices will also be driven by Russia's role in the development of its continental shelf.<sup>26</sup>

In the next decade, rather than opting to finance the offshore exploration and production on its own, Moscow may decide, or will be compelled by circumstances, to invite foreign investment. In this case, Russia will need to send the right signals to foreign capital by displaying transparency in its regulatory regime and policies. At the moment, the Yukos affair and the Kremlin's growing interference (often of an informal nature) in the oil and gas sector only fuel foreign investors' anxiety. Russia has not ratified the Washington Convention of 1965 which establishes international legal mechanisms for foreign investors to resolve investment disputes. The Russian government has not, so far, offered adequate tax and other incentives to foreign companies to guarantee foreign investors stable taxes for the duration of the specific project.

### Environment

Environmental issues will pose significant challenges for companies seeking to pursue large-scale Arctic oil and gas development. The Arctic includes unique habitats of indigenous Northern cultures, landscapes, fauna and flora, and marine life. Recent environment concerns over Sakhalin-2, the North Slope of Alaska and the Alaskan National Wildlife Refuge have prompted a response by local and international environment groups highlighting the potential problems companies are likely to face with their Arctic offshore projects. In order to proceed with their Arctic hydrocarbon ventures, companies will need to facilitate a full-scale international cooperation with local indigenous communities, environment organisations, government agencies, and academic institutions dealing with environment research, climate change, oceanography, marine biology, to mention just a few. Addressing environmental issues will almost certainly add to the costs of Arctic hydrocarbon development.

### ***The Arctic Midstream: The Northern Sea Route and the Northwest Passage***

The melting polar ice cap will not only make it possible to extract hydrocarbon resources from the Arctic seabed, it will also open strategic shipping lanes connecting the polar region to major energy markets. The opening of the Northern Sea Route and the Northwest Passage has the potential to transform global shipping patterns.

The Northern Sea Route (NSR), also described as the Northeast Passage, is a shipping passage stretching from the North Atlantic, along the Siberian coast, to the Russian Far East and the Pacific Ocean.

In comparison with traditional southern sea routes via the Suez or Panama Canals, the NSR offers a considerable reduction (about 40 percent) in the travelling distance between Europe and the west coast of North America, Northeast Asia and the Far East.<sup>27</sup> For example,

the traditional southern route (via the Suez Canal) between Hamburg and Yokohama is 11,430 miles; the Northern Sea Route reduces this distance to only 6,900 miles. In a similar manner, the distance between an important Arctic sea port, Murmansk, and the Canadian east coast is only half the distance from Abu Dhabi on the Persian Gulf to the port of Galveston in Texas.<sup>28</sup>

*Map Three. The Northern Sea Route and the traditional Southern Route.*



Northern Sea Route  
Southern Route

Source: International Northern Sea Route Programme, <http://www.fni.no/insrop/>

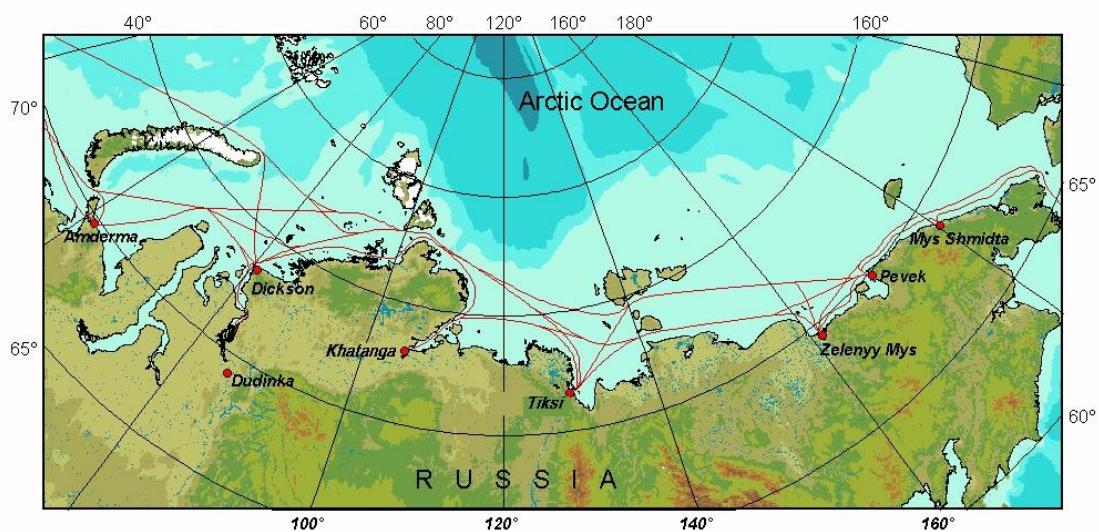
At present, the Northern Sea Route is accessible only during the summer. However, within the next 20–30 years, global warming is projected to make the route fully operational all year round.

Apart from the melting ice, other factors make the Northern Sea Route an attractive option for commercial shipping: political instability in the Middle East, congestion in the Suez and Panama Canals, and piracy in strategic waterways in South East Asia.<sup>29</sup> Russia has opened the NSR to foreign vessels, but a few key issues must be resolved in order to make the NSR a competitive and attractive transport route for commercial goods and hydrocarbons. At present, the NSR lacks the surface infrastructure, navigation support systems, environmental safeguards, and transparent tax and tariff system required of a world-class

waterway. Large capacity vessels with icebreaking capabilities will still be necessary in the NSR for the foreseeable future.<sup>30</sup>

Until the ice melts, Russia will require several Arctic class tankers, such as EC-10 and EC-15 to facilitate effective and environmentally stable transportation of hydrocarbons through the NSR.<sup>31</sup> The first of these vessels, the Mikhail Ulyanov, is scheduled to start serving the west Arctic Prirazlomnoye field in 2009.<sup>32</sup> Russian companies Sovkomflot and Primorsk Shipping Corporation between them already have a dozen Ice Class 1A tankers that are technically close to the Arctic class.

*Map Four. Russia and the Northern Sea Route.*



Source: Taken from the International Northern Sea Route Programme (INSPOR) (<http://www.fni.no/inspor/>).

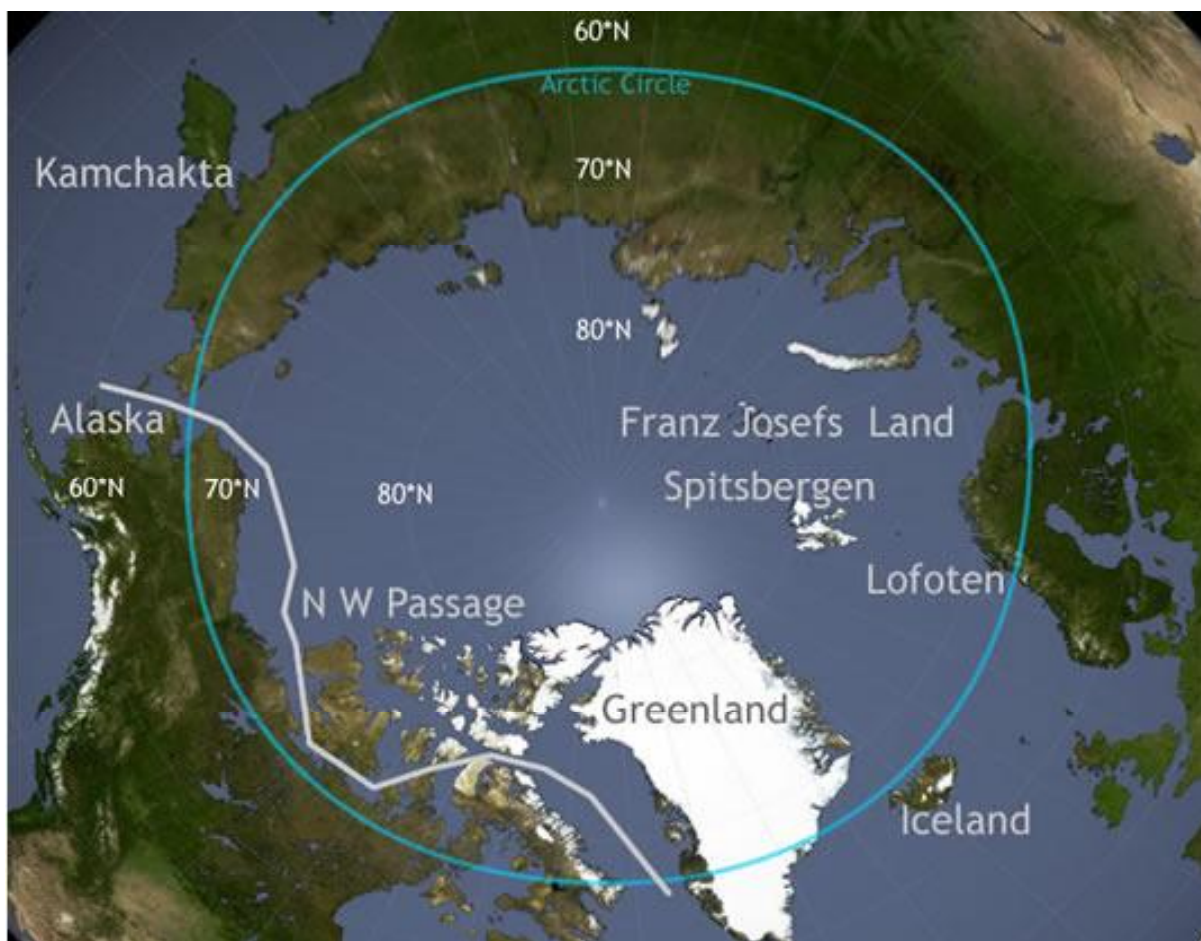
According to the 2006 Ice Class Tanker Sector Report and the 2007 Ice Class Shipping Report, Arctic offshore developments may have already boosted the building of new Ice Class 1A/1AC tankers, of which as many as 167 have already been ordered.<sup>33</sup> The full opening of the NSR is likely to stimulate the development of hydrocarbon reserves in the Arctic, Siberia and the Russian Far East by providing an efficient export route to world markets.

The Northwest Passage (NP) runs through the Canadian Archipelago and connects the Atlantic and Pacific Oceans. Due to dense ice, commercial ships are unable to traverse the passage without the assistance of icebreakers. However, over the next 20 to 30 years, the Arctic ice pack will melt at such a rate that ships will be able to sail the waterway without assistance. By the end of the century, the NP is expected to be open 120 days a year. In ice-free conditions, the passage could reduce the trip from London to Tokyo by 5,000 kilometres (3,000 miles) compared with the Suez Canal route, or 8,000 kilometres (5,000 miles) compared with the Panama Canal route. The Canadian government claims sovereignty over its archipelagic waters, but the U.S.A. and the E.U. consider the NP to be international waters.

In order for Arctic hydrocarbon development to become economically practicable on a large scale, transportation costs must be minimized. For instance, to deliver resources from Timan–Pechora basin and the Barents Sea to Europe, it might be necessary to use

icebreakers to open a shipping route for ice-resistant supertankers to travel from the Pechora Sea port of Varandey to the European seaboard. If such a shipping lane were established, it could facilitate the development of offshore fields in the Barents, White, Pechora and Kara Seas and reduce the pressure on Russia's ageing overland pipeline system.<sup>34</sup>

*Map Five. The Northwest Passage*



Source: [http://www.pelagic.co.uk/newsinfo/chronpressrels/050728\\_nwp\\_indexpage.htm](http://www.pelagic.co.uk/newsinfo/chronpressrels/050728_nwp_indexpage.htm)

### **Conclusion**

The international reaction to Russia's recent polar expedition has highlighted the Arctic's potential as a future hydrocarbon resource base for global energy markets. Simultaneously, it unveiled once again the realities of global warming which is speeding up the melting of the polar ice cap and so opening up Arctic mineral treasures for exploration. Faced with a depletion of their own oil and gas resources, polar nations will seek a share in northern

The contents of this paper are the author's sole responsibility. They do not necessarily represent the views of the Oxford Institute for Energy Studies or any of its Members.

offshore hydrocarbon reserves long before 2025–2030, when the Arctic thaw will be at its peak. In this respect the Kremlin is better positioned than the rest. It was the first to state its claim and most of the resources are located in its territorial waters. Russia also appears to be the only polar nation to have a centrally directed development strategy in relation to the Arctic. What Russia lacks is the essential technology for hydrocarbon exploration. This factor may play a crucial role in defining a future international system of Arctic hydrocarbon production. Under the current state of its technological evolution, Russia is unlikely to adopt a mercantilist system of oil and gas exploration in the Arctic, and is bound to seek cooperation with other polar nations in joint hydrocarbon production.

## *APPENDIX.*

### *Timeline of Arctic Exploration and Development*

- 1903–05 – Norwegian explorer Roald Amundsen is the first to successfully navigate the Northwest Passage.
- 1909 – American explorers Robert Peary and Matthew Henson are the first to reach the North Pole.
- 1909 – Canada claims legal rights to the territory from its Arctic Sea shore to the North Pole.
- 1910–1915 – The Imperial Russian Navy explores and maps the Northern Sea Route in the hope of opening the passage for commercial shipping.
- 1924 – The U.S.A. claims that the North Pole is an underwater continuation of Alaska.
- 1926 – The U.S.S.R. claims the territory from the Kola Peninsula, across the North Pole to the Bering Strait. The other circumpolar states do not dispute this Soviet declaration.
- 1954 – The Soviet Arctic Institute discovers mountain ranges below the surface of the Arctic Ocean.
- 1958 – The U.S. submarine Nautilus sails underneath the Arctic ice cap and crosses the North Pole.
- 1958 – The U.S. submarine Skate becomes the first vessel to surface at the North Pole.
- 1963 – Significant iron ore deposits found on Baffin Island.
- 1968 – U.S. companies discover oil at Prudhoe Bay on Alaska’s Arctic coast.
- 1969 – The U.S. tanker Manhattan and an icebreaker sail through the Northwest Passage. Canadian nationalists protest against the voyage.
- 1970 – Canada passes the Arctic Waters Pollution Act and extends its Arctic territorial claims from 3 to 12 miles from its coastline, effectively claiming sovereignty over several key straits in the Northwest Passage.
- 1977 – The Alaska Pipeline is completed and oil fields at Prudhoe Bay begin large-scale production.
- 1982 – The U.N. passes the Convention on the Law of the Sea (UNCLOS).
- 1985 – The U.S. Coast Guard icebreaker Polar Sea sails through the Northwest Passage. Canada responds by reasserting its sovereignty over the Arctic Archipelago.
- 1988 – The U.S. and Canada sign the Arctic Cooperation agreement stating that U.S. icebreakers require permission from the Canadian government before traversing the Northwest Passage.
- 1994 – UNCLOS comes into effect.
- 1996 – Norway ratifies the UNCLOS.
- 1997 – Russia ratifies the UNCLOS.
- 2000 – Russia lays claim to the Lomonosov and Mendeleev Ridges, increasing its continental shelf claim to 1.2 million square kilometers.
- 2003 – Canada ratifies the UNCLOS.

- 2004 – Denmark ratifies the UNCLOS. Copenhagen declares the Lomonosov Ridge is a continuation of Greenland but does not submit its claims to the U.N.
- 2005 – A U.S. nuclear submarine allegedly passed through Canadian Arctic waters without permission from Ottawa.
- 2006 – Norway files an application with the UN claiming 250,000 square kilometers of continental shelf in the Norwegian and Barents Seas.
- May–August 2007 – Russian scientists gather evidence to support their claims that the Lomonosov and Mendeleev Ridges are extensions of the Russian continental shelf. The U.S.A., Canada and Denmark respond with Arctic expeditions.

<sup>1</sup> See Robert Skinner and Robert Arnott, *The Oil Supply and Demand Context for Security of Oil Supply to the EU from the GCC Countries*, prepared for EUROGULF: An EU-CCG Dialogue for Energy Stability and Sustainability, April 2005, Kuwait City, <http://www.oxfordenergy.org/pdfs/WPM29.pdf>; Robert Skinner, *World Energy Trends: Recent Developments and their Implications for Arab Countries*, 2006, the 8th Arab Energy Conference, Amman, Jordan (<http://www.oxfordenergy.org/pdfs/SP19.pdf>).

<sup>2</sup> John Westwood, Owen Williams, Michael Smith, *Offshore Prospects—A Long Term View*, SUT-Society for Underwater Technology, London, 20 April 2005 ([http://events.sut.org.uk/past\\_events/2005/0504201/050420.pdf](http://events.sut.org.uk/past_events/2005/0504201/050420.pdf)).

<sup>3</sup> See *Impacts of a Warming Arctic - Arctic Climate Impact Assessment*, An international project of the Arctic Council and the International Arctic Science Committee (IASC), to evaluate and synthesize knowledge on climate variability, climate change, and increased ultraviolet radiation and their consequences. The results of the assessment were released at the ACIA International Scientific Symposium held in Reykjavik, Iceland in November 2004. Available online at <http://www.acia.uaf.edu/>.

<sup>4</sup> Sergei Donskoi (Director of the Economic and Finance Department, Russian Ministry of Natural Resources), “Medlit nel’zya speshit”, *Neft i kapital*, No. 6 (126), June 2006, p. 138.

<sup>5</sup> Martin Clark, ‘Arctic: A tough nut to crack’, *Petroleum Economist*, February 2007, p. 32.

<sup>6</sup> Ibid.

<sup>7</sup> Ibid.; Kristin Rønning and Geirr Haarr, *Exploring the Basins of the Arctic*, Statoil ASA, 2005 ([http://www.cge.uevora.pt/aspo2005/abscom/Abstract\\_Lisbon\\_Ronning.pdf](http://www.cge.uevora.pt/aspo2005/abscom/Abstract_Lisbon_Ronning.pdf)).

<sup>8</sup> Shamil Idiatullin, ‘Udar nizhe polyusa’, *Kommersant Vlast*, No. 31 (735), 13 August 2007 (<http://www.kommersant.ru/doc.aspx?DocsID=794555>); *World Energy Outlook*, International Energy Agency, 2006, p. 66.

<sup>9</sup> Olga Loskutova, ‘Etot trudnodostupnyi arkticheskii shelf’, *Maritime Market – Morskaya Birzha*, No. 19, 2007 ([http://www.maritimemarket.ru/arctic\\_shelf19.html](http://www.maritimemarket.ru/arctic_shelf19.html)).

<sup>10</sup> Martin Clark, op. cit.

<sup>11</sup> Aleksandr Timonin, “Na podstupakh k Yamalu”, *Neft’ i kapital*, August 2005.

<sup>12</sup> Ilya Klebanov, “A Region of Strategic Importance,” *Oil of Russia*, no. 1 (2007).

<sup>13</sup> “Russia-Former Soviet Union”, *Energy Files*, <http://www.energyfiles.com/eurfsu/russia.html>

<sup>14</sup> Martin Clark, op. cit.

<sup>15</sup> Clark, 32.

<sup>16</sup> Shamil Idiatullin., op. cit.

<sup>17</sup> Jonathan P. Stern, *The Future of Russian Gas and Gazprom*, Oxford: OUP, 2005, p. 32.

<sup>18</sup> *BP Statistical Review of World Energy 2007*, pp 6, 8.

<sup>19</sup> See <http://www.statoil.com/statoilcom/snohvit/svg02699.nsf?OpenDatabase&lang=en>

<http://www.hydro.com/ormenlange/en/>

<sup>20</sup> Sergei Donskoi, op. cit.

<sup>21</sup> ‘15 arkticheskikh mestorozhdenii ne privlekayut investorov iz-za ekstremal’nykh prirodnykh uslovii’, *Neft’ Rossii*, 25 February 2007.

<sup>22</sup> Sergei Bogdanchikov, ‘Platsdarm dlya Arktiki’, *Neft’ i capital*, No. 7, July 2007.

<sup>23</sup> Sergei Bogdanchikov, op.cit.

<sup>24</sup> Ilya Klebanov, ‘A Region of Strategic Importance’, *Oil of Russia*, no.1, 2007.

<sup>25</sup> Vladimir Emel’yanenko, ‘Ledianaya likhoradka’, *Profil*, No. 29 (537), 13 August 2007.

<sup>26</sup> ‘Neft’ iz Arktiki’, *RIA Novosti*, 13 May 2005.

<sup>27</sup> Ocean Policy Research Foundation (<http://www.sof.or.jp/international/nsr/index.html.en>).

<sup>28</sup> Erich Wiedemann, ‘Global Warming: Profiteering from the Arctic Thaw’, *Spiegel Online*, 10 March 2006 (<http://www.spiegel.de/international/0,1518,405320,00.html>).

<sup>29</sup> On piracy problems in SE Asia, see Catherine Zara Raymond, ‘Piracy in Southeast Asia: New Trends, Issues and Responses’, *Harvard Asia Quarterly*, Volume IX, No. 4. Fall 2005 (<http://www.asiaquarterly.com/content/view/30/>).

<sup>30</sup> See ‘Issues to be Resolved for NSR Operation’, *The Northern Sea Route: The shortest sea route linking East Asia and Europe*, The Ship and Ocean Foundation, 2001, pp. 147-161 ([http://www.sof.or.jp/international/nsr/pdf/rp\\_ar0103e.pdf](http://www.sof.or.jp/international/nsr/pdf/rp_ar0103e.pdf)).

<sup>31</sup> Maria Saplinova, ‘Gotova li Rossiya k dobyche nefi na shel’fe?’, *Bellona*, 30 July 2005.

<sup>32</sup> ‘V Sankt-Peterburge zalozhen novyi arkticheskii tanker’, *Regnum*, 08 June 2007.

<sup>33</sup> *Ice Class Tanker Sector Report 2006*, Clarkson Research Services, 2006; *Ice Class Shipping 2007 - With Focus on Ice Class Tankers*, Clarkson Research Services, 2007.

<sup>34</sup> [http://www.oilonline.com/news/features/aog/20070611.Arctic\\_e.23780.asp](http://www.oilonline.com/news/features/aog/20070611.Arctic_e.23780.asp).