



# OFFSHORE HYDROCARBON

## Contents

- Introduction
- Hydrocarbon Exploitation in the Arctic Region
- Potential Environmental and Social Consequences in the Marine Arctic
- Legal and Policy Framework, Transboundary Environmental Impact Assessment
- Perspectives on the Way Forward

## Introduction

Offshore hydrocarbon activity in the Arctic marine area is on the rise. There are numerous reasons for this. The Arctic region is rich with natural resources, in particular oil and gas deposits. Due to global warming, sea ice in the Arctic is melting rapidly and thereby the Arctic waters are increasingly open for resource exploration and exploitation. Global demand for oil and gas is also increasing despite policy efforts to switch to more climate-friendly energy sources. This demand further increases the pressures to exploit the Arctic's hydrocarbon deposits. Furthermore, the progress in technology, ship design and the drilling gear and logistics have reduced the accessibility problems related to Arctic offshore hydrocarbon exploration and exploitation.

It is estimated that the Arctic sea bed may hold almost one-fourth of the world's undiscovered oil and gas deposits.

**Table 1: Hydrocarbon activities in the Arctic**

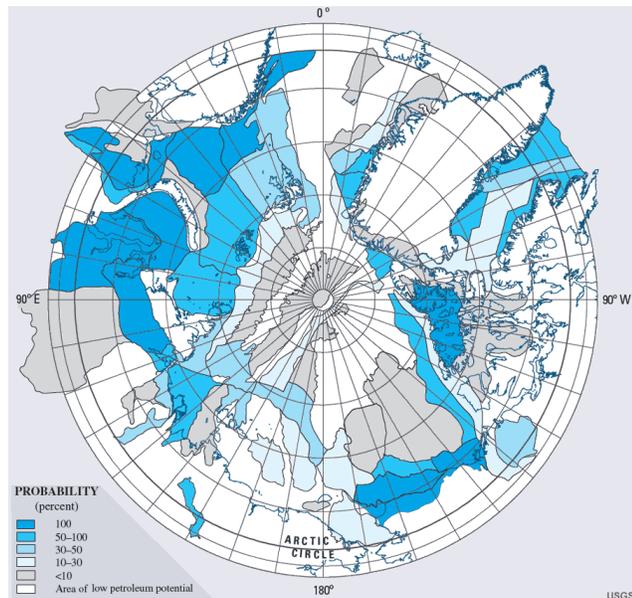
| Country              | Areas and Reserves   |
|----------------------|--|
| <b>United States</b> | <ul style="list-style-type: none"> <li>• Most of the activities occur onshore in the Prudhoe Bay.</li> <li>• Near shore fields include:               <ul style="list-style-type: none"> <li>• Endicott oil field – 582 million barrels of recoverable oil.</li> <li>• Point Macintyre field – 400 million barrels of recoverable oil.</li> <li>• Northstar field – 176 million barrels of recoverable oil.</li> <li>• Oooguruk oilfield -- 90-million-barrel of recoverable oil</li> </ul> </li> </ul>  |
| <b>Russia</b>        | <ul style="list-style-type: none"> <li>• Mostly onshore in Western Siberia – 60 billion barrels of oil reserves.</li> <li>• Russian Arctic Shelves – 80% of Russia's potential oil and gas reserves.</li> <li>• Significant gas reserve – approximately 1,700 trillion cubic feet.</li> <li>• Prirazlomnoe oil field – 83.2 million tonnes of recoverable oil.</li> <li>• Kolokolmor and Pomor area – 300 million tonnes of recoverable oil.</li> </ul>  |
| <b>Canada</b>        | <ul style="list-style-type: none"> <li>• Drake Point onshore – 17.5 trillions cubic feet of gas.</li> <li>• Bent Horn onshore Melville Island – production started in 1985 with a shipment of 100,000 barrels of oil.</li> <li>• Terra Nova oil field contains 300-400 million barrels of recoverable oil.</li> <li>• White Rose oil field contains 250 million barrels of recoverable oil.</li> <li>• Hebardnia oil field contains 615 million barrels of recoverable oil.</li> <li>• Beaufort Sea/Mackenzie Delta – onshore and offshore.</li> <li>• Exploration continues.</li> </ul> |
| <b>Norway</b>        | <ul style="list-style-type: none"> <li>• Overall proven oil reserve is 10.2 billion barrels.</li> <li>• Significant gas reserves.</li> <li>• Barents sea area: attracts oil and gas activities.</li> </ul>   |
| <b>Greenland</b>     | <ul style="list-style-type: none"> <li>• Exploration activities are moving forward.</li> <li>• Nuussuaq peninsula – traces of hydrocarbons were found.</li> <li>• There remains petroleum prospective area between western Greenland and the east coast of Canada.</li> </ul>  |



## Hydrocarbon Exploration in the Arctic Region

Most of the oil and gas reserves in the Arctic are located in Russia, including oil in the Pechora Basin, gas in the Lower Ob Basin, and other potential oil and gas fields along the Siberian coast.

**Figure 1: Estimates of Undiscovered Oil and Gas North of the Arctic Circle.**



Note: colour coding shows the assessed probability of the presence of at least one undiscovered oil and/or gas field with recoverable resources greater than 50 million barrels of oil equivalent. Source: reproduced from USGS Arctic Oil and Gas Report (2008), Estimates of Undiscovered Oil and Gas North of the Arctic Circle, at: <http://geology.com/usgs/arctic-oil-and-gas-report.shtml>

## Potential Environmental and Social Consequences in the Marine Arctic

Environmental threats are increasing. Offshore oil and gas activities are likely to pose a challenge to the overall Arctic marine area. The Arctic marine environment is especially vulnerable to oil spills due to slow recovery of the cold and highly seasonal ecosystems as well as the difficult conditions for cleaning operations. Spills occurring or spreading under sea ice can not be cleaned up effectively.

With the increase of oil and gas activities in the region, the likelihood of an oil spill steadily increases. A large oil spill, which can spread over

hundreds of kilometres, could be a major environmental threat to the Arctic marine area. In addition to spills, hydrocarbon activities have other impacts on marine environment, such as noise generated by seismic explorations that disturb many marine species and can force species to temporarily move away from their habitat or harm them if they are unable to move away.

The impact of large oil spills can be long lasting and substantial. Spills impact a number of marine species, mainly fish stocks in the embryonic stage and feathered and fur bearing animals. They are affected by oil spills which result in problems in inhalation and ingestion of oil; oil spills can also create long term contamination that may affect populations and ecosystems for decades.

The expanding hydrocarbon activities also cause increasing disruptions for traditional livelihoods and indigenous cultures (e.g. indigenous peoples may be forced to abandon their traditional lands). Offshore oil and gas activities can also threaten the human health as petroleum hydrocarbons are toxic. Hydrocarbon activities, on the other hand, can significantly contribute to improving the local economies (e.g. by creating employment opportunities thereby connecting locals to the global market economy).

## Legal and Policy Framework, Transboundary Environmental Impact Assessment

Offshore oil and gas activities are covered in part by general legal principles found, for instance, in the LOS Convention. There are only a limited number of treaties that address prevention of pollution from offshore installations, and/or identify detailed measures for responding to the emergencies caused by these activities.

It should be noted that there is only one convention that is specifically tailored to the Arctic - the 1983 Agreement between Denmark and Canada for Cooperation Relating to the Marine Environment - which is bilateral, not multilateral. The applicable conventions and their relevance with offshore oil and gas activities are summarised in Table 2 below.

The main transboundary environmental impact assessment (TEIA) Convention is the Espoo

Convention on Environmental Impact Assessment in a Transboundary Context.<sup>1</sup>

**Table 2: The applicable conventions and their relevance with offshore hydrocarbon activities**

| Applicable Conventions  | Arctic state parties and covering area  | Relevance with Offshore Hydrocarbon Activities   |
|---|---|--|
| <b>United Nations Law of the Sea Convention (1982)</b>  | -Parties: all except the US (the US is bound by the customary law principles, most of which have been incorporated in the Convention).<br><br>-Covers: the whole marine Arctic except the part belonging to the US. | The Convention provides rules regarding continental shelf, outer continental shelf, exclusive economic zone etc. The provisions are relevant in the context of exploration and exploitation of oil and gas activities. The Convention also provides generally applicable rules governing marine environmental pollution that may come out from the oil and gas activities. |
| <b>Bilateral Agreement between Denmark and Canada for Cooperation Relating to the Marine Environment (1983)</b>         | -Parties: Canada and Denmark<br><br>- Covers: The Arctic marine areas between Canada and Greenland (Denmark).   | The Agreement provides provisions to ensure appropriate measures in the engagement of installations for exploration and exploitation of natural resources of the seabed and subsoil in the respective areas of the countries so that risk of pollution is minimized.   |
| <b>The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) Convention (1992)</b> | -Parties: Denmark, Finland, Iceland, Sweden and Norway.<br><br>-Covers: The Atlantic and Arctic ocean and their dependent sea lying north of 36 north latitude and between 42 west longitude and 51 east longitude. | The Convention deals with, among the others, offshore activities carried out in the maritime area for the purpose of exploration, appraisal or exploitation of liquid and gaseous hydrocarbons, and other offshore sources such as installations and pipelines that can cause pollution.   |

<sup>1</sup> The convention was signed by all the Arctic States. Russia, the US and Iceland are not parties yet but are expected to join.

|  |  |  |
|--|--|--|
| <b>International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC) (1990)</b>   | -Parties: All except Russian Federation<br><br>-Covers: the whole of the Arctic area except Russia's part.                 | The Convention requires national or cooperative measures to deal with pollution incidents and oil pollution emergency plan.  |
| <b>The Agreement between Denmark, Finland, Iceland, Norway and Sweden Concerning Cooperation in Measures to deal with Pollution of the Sea by Oil or other Harmful Substances (1993)</b> | -Parties: Denmark, Finland, Iceland, Norway and Sweden<br><br>-Covers: The Arctic waters of Greenland, Iceland and Norway. | The Agreement specifies measures of monitoring and dealing with events such as oil spills occurring within the waters under the jurisdiction of the parties in the territorial sea, EEZ and continental shelf. |

The Espoo Convention applies to several offshore hydrocarbon activities but it is only obligatory if such activity is likely to cause adverse transboundary impacts to the environment under the jurisdiction of another contracting state.<sup>2</sup> The Espoo Convention establishes a legal basis for a TEIA between the states that are party to it. There are also other bilateral, multilateral and universal treaties that provide for TEIA procedures between the Arctic states (e.g. 1983 Agreement Between Denmark and Canada for Cooperation Relating to the Marine Environment and Article 206 of the LOS Convention).

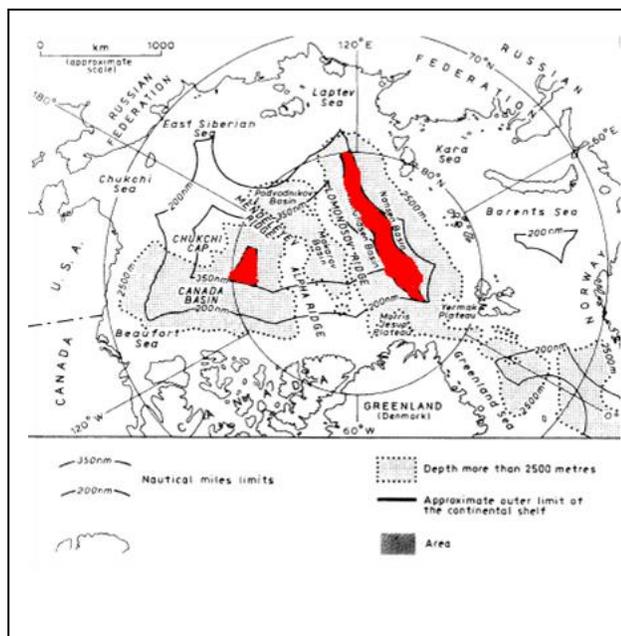
There is also work among the Arctic states to develop guidance on how to conduct EIAs and transboundary EIAs in the Arctic. In 1997, the Arctic states agreed the Guidelines for Environmental Impact Assessment in the Arctic. Furthermore, the Arctic Council has significantly contributed through the Protection of Arctic Marine Environment (PAME) working group, which has provided Arctic Offshore Oil and Gas Guidelines. However, the guidelines are not legally binding, and there is as

<sup>2</sup> The parties to the Convention also developed a special protocol on SEA which was largely inspired by the SEA directive of the EC. The Protocol has little potential as it is not signed by four of the Arctic states and has not entered into force yet.

yet no overall evaluation on how it influences offshore oil and gas operation in the region.

Natural resources in the sea bed are subject to the exclusive control of the coastal state up to the length of the continental shelf according to the LOS Convention<sup>3</sup>. Where the continental margin exceeds 200 nautical miles from the baseline, the coastal states are required to submit a claim to the UN Commission on the Limits of the Continental Shelf. The Arctic waters are shallow which entitles the Arctic states to make vast claims. Currently, all Arctic states, except the US which is not a party to the Convention, are engaged in submitting their claims for extended continental shelf. If the claims are successful, a vast area of the sea bed will be under national jurisdiction. Coastal shelf limits are presented in Figure 2.

**Figure 2: The continental shelf in the Arctic Ocean**  
(Source: *The Law of the Sea and Polar Maritime Delimitation and Jurisdiction*, edited by A.G Oude Elferink and D.R. Rothwell, pp. 150.



### Perspectives on the way forward

Offshore hydrocarbon activities are likely to increase in the Arctic region. There is some non-binding guidance (e.g. the Arctic Offshore Oil and Gas Guidelines, which is updated and revised regularly) but its actual effectiveness is unclear. The

<sup>3</sup> The United Nations Convention on the Law of the Sea, ratified by 155 states.

lack of legally binding mechanisms to regulate these activities could endanger sustainable exploitation of the region's resources and threatens the region's vulnerable environment, ecosystems and human communities.

### Topics for discussion

- Possible effects and measures: both negative and positive consequences of oil and gas activity on overall Arctic marine area and their mitigation and adaptation measures.
- Scope: legal mechanisms, transboundary impact assessments, policy guidelines, and their effectiveness.
- Transatlantic contribution: possible need for Arctic-specific legal guidance on how to perform hydrocarbon activities in a safe manner.

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**ARCTIC TRANSFORM**  
**Transatlantic Policy Options for Supporting Adaptations in the Marine Arctic**

For additional information about the project, please refer to the project website:

<http://www.arctic-transform.org>

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<sup>4</sup> This policy brief is abridged from the full Arctic Transform background paper on offshore hydrocarbon.