

Arctic oil and Gas Assessment

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1. Project / publication	Arctic oil and Gas Assessment The assessment is documented in two different products: <ul style="list-style-type: none">• Arctic Council (2007): <i>Arctic oil and Gas 2007</i>. Oslo: AMAP. ISBN 978-82-7971-048-6, 57 pages.• Arctic Council (2010): <i>Oil and Gas Activities in the Arctic – Effects and Potential Effects. Volume 1 + 2</i>. ISBN-13 978-82-7971-061-5 and ISBN-13 978-82-7971-062-2. Oslo: AMAP. Scientific reports (429 + 283 pages) that have been subject to both scientific and national review from government agencies. Volume 3 of the scientific report is chapter 6, "Status and vulnerability of Arctic ecosystems". This has not been printed and is only available electronically. The chapter alone is several hundred pages. Electronic access: http://www.amap.no/oga/ The review here is limited to how future developments are treated and does not attempt to treat the whole reporting comprehensively.
2. Initiator	The project was prepared in response to the Arctic Council ministerial meeting in 2004.
3. Objective	The assessment is an update and expansion of the work on petroleum hydrocarbons in the 1997 AMAP assessment on pollution in the Arctic. The 2004 Arctic Climate Impact Assessment conclusion that Arctic conditions may be more favourable for resource extraction also gave impetus to the work. The objective was to present a holistic assessment of the environmental, social, economic and human health impacts of current oil and gas activities, and to evaluate the likely course of development of Arctic oil and gas activities and their potential impacts in the near future.
4. Geographical delimitation	The area is a modified version of the "AMAP area" used in several other assessments. See chapter 1.2.2 in the scientific report. Within this area, petroleum developments are patchy according to resource occurrence, regulations and phases of development. Data and studies from specific sub-regions or local areas are therefore common.
5. Time horizon	Arctic oil and gas activities are followed from their early roots through the first industrial activities in the 1900's until today. Some perspectives of developments the next decade up to 2020 are also provided.
6. Thematic focus	The intention was to present a holistic view on the development and impacts of Arctic oil and gas activities (ref. question 3). The report makes several delimitations of this scope: <ul style="list-style-type: none">• The focus is on development and extraction of petroleum hydrocarbons, not on other hydrocarbon uses.• Environmental effects from pollution or physical impacts or disturbances are included; other impacts are not• Global effects on greenhouse gas emissions and related warming are

	<p>not a part of the study. So are other widespread environmental problems like ocean acidification and eutrophication.</p> <ul style="list-style-type: none"> • Impacts are as far as possible attributed to petroleum activities, limiting the analysis of interactions with other processes influencing nature and society • Human health effects include only non-occupational exposures
<p>7. Images of the future</p>	<p>The project only has a brief outlook on future petroleum activities in the Arctic.</p> <p>In the overview report, the final chapter is called “Oil and gas activities in the future”. Two pages specifically addressing future developments start with referring the Arctic resource potential and continues: ”With rising global demand, oil and gas activity in the region is expected to increase”. Russia, Canada and Alaska are highlighted as central areas. Major pipeline developments are anticipated without discussion, including West Siberia/Timan Pechora to a western port, the Mackenzie Valley gas pipeline and an Alaskan pipeline from the North Slope. Offshore areas in Greenland, Iceland, Faro Islands, Arctic Russia, and Alaska are mentioned as being of particular interest farther into the future. This is followed by a general description of what determines ecosystem vulnerability and management actions that can reduce risks and negative impacts.</p> <p>Neither in the overview report nor in the scientific reports there is much emphasis on future activities. Details supporting the outlook referred above can be found on page 2-255 to 2-258 in the scientific report.</p> <p>Chapter 3 on social and economic effects comprises of case studies demonstrating that effects can be both positive and negative and that institutions make a difference. A final section looks into the future, describing some broad expectations, but without trying to make predictions or future scenarios (section 3.3.4).</p>
<p>8. Key driving forces</p>	<p>From the summary report, the interactions of the following factors are mentioned as central for whether and when oil and gas developments will take place in the Arctic (p 32-33):</p> <ul style="list-style-type: none"> • Rising global demand for oil and gas, including from emerging economies • Price of oil (throughout the report treated as the most determining factor for Arctic activity) • Energy security • Resource potential for various areas • The geologic nature of deposits • Long-term trends in oil and gas prices • The regulatory framework and management regimes • Infrastructure capacity • Operating costs in the Arctic, that are typically high <p>Depletion of existing oil and gas reserves may in a longer time perspective (>25 years) lead to greater interest in unconventional Arctic hydrocarbons like heavy oil, coalbed methane and methane hydrats.</p> <p>In section 2.2.2.4 of the scientific report, some additional factors can be found:</p> <ul style="list-style-type: none"> • Large discoveries that can bear the costs of large scale infrastructure developments • Depletion of resources and transport capacity as an incentive to find additional resources • Incentives from host governments • Socio-economic drivers such as public acceptance and political support

	<ul style="list-style-type: none"> • The need for the industry to keep a resource base • The need for national companies to participate as instruments for national policies guided by other interests than prices <p>A list of restricting factors are also discussed here, including permitting issues, long distances, transportation limitations, harsh operation conditions, technological limitations, seasonality, environmental mitigation, total costs, delays and indigenous land-claims.</p> <p>From the discussion of historic developments, it is possible to learn more about driving forces than what has been referred above (see summary in section 2.10). Examples include the drive for common international standards through international finance institutions and large multinational companies, limitations on processing capacity, EIA as a part of the regulatory regime, interplay between environmental regulations and adaptation of technologies to Arctic conditions, blowouts etc.</p>
9. Uncertainties/wildcards	Uncertainty about future developments is generally recognized as high. But without elaborate discussions about the future, no "wildcards" are presented.
10. Accomplishment and collaboration	<p>The Arctic ministers requested AMAP to lead the assessment, but to include other working groups as well. EPPR and PAME participated. An Assessment Steering Group was established, consisting of representatives for each working group and the Lead authors of each chapter in the scientific report. This group was responsible for the completion of the assessment, reporting directly to AMAP and indirectly to other working groups.</p> <p>There is no documentation of participatory processes; the assessment seems to be completely expert-based.</p>
11. Method	The study seems to be qualitative, based on other publications that also may use quantitative approaches.
12. Sources of information	Data mostly cover the time period up to 2004/05. The report seems to assemble much statistics from the countries.
13. Strengths	<p>For studying future developments of the petroleum activities in the Arctic, the report first of all can contribute with a thorough description of the historic developments in all the Arctic countries. This includes their major legal and regulatory systems, oil spill preparedness and response, and monitoring/research activities.</p> <p>Chapter 5 gives a thorough review of petroleum hydrocarbons and their toxicological effects.</p>
14. Weaknesses	<p>Given the mandate about future developments, the study is surprisingly weak in its approach to follow up on this. At a general level in the introduction to the last chapter in the overview report, uncertainties about the future are recognized as high. But when concrete future developments are described, it is mostly done as projections and without discussions about other possible outcomes.</p> <p>Unqualified projections are for example given about the amounts of petroleum products to be shipped out from NW Russia, and future developments of Russian fields in the Barents Sea. Plans for developing transportation by both pipelines and tankers are presented, but without discussing possible shifts in the balance between these modes. Official plans for developments are quoted. But history has taught us that they constantly are delayed or changed. Extraction of oil from shale in Canada and the accident in the Gulf of Mexico are examples of events with wide implications on Arctic petroleum activities that have occurred after the report was written.</p>

<p>15. Attention and significance</p>	<p>My impression is that the study has received little attention after it was published. It should at least be fair to say so compared to the influence of two other Arctic Council assessments reviewed in this project, ACIA and AMSA. One reason can be that the overview report does not have the same quality as the corresponding reports from those assessments, and the almost 3 year delay before the scientific report was distributed. This delay means that the assessment is based on data that are mostly 5-6 years old and easily can be disregarded as outdated. Factors external to an assessment may also contribute to its influence, though it is hard to find such explanations in this case.</p> <p>When addressing future prospects on Arctic oil and gas activities, it is common to use the 2009 resource estimates from US Geological Survey combined with other sources more updated on recent developments.</p>
<p>16. Relevance for the Fram Centre</p>	<p>The assessment is useful as a source of information on Arctic petroleum activities in general.</p>