Model Arctic Council

Background Guide

Protection of Arctic Marine and Environment Working Group

The Effects of Oil and Gas Activities on the Arctic Marine Environment

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INTRODUCTION[1]

The Arctic is an enormous area, sprawling over one sixth of the earths' landmass; more than 30 million km^2 and twenty-four time zones. It has a population of about four million, including over thirty different indigenous peoples and dozens of languages. The Arctic is a region of vast natural resources and a very clean environment compared with most areas of the world.[2]

The Arctic's social, political, and economic landscapes are diverse and complex. The vast networks of stakeholders and dynamic relationships display the interconnectedness between international relations and local and indigenous communities and concerns. The story of the Arctic is a case study of the opportunities and challenges within an increasingly globalized world.

The purpose of this background paper is to explore arctic oil and gas activities within the context the Model Arctic Council and the Model Protection of the Arctic Marine Environment Working Group (or Model PAME). It will provide an overview of the challenges that stakeholders face; will act as catalyst to critical thought; and, will provide general and specific guidance for future research.

THE PROTECTION OF ARCTIC MARINE ENVIRONMENT WORKING GROUP

The Ottawa Declaration of 1996 formally established the Arctic Council as a high level intergovernmental forum to provide a means for promoting cooperation, coordination and interaction among the Arctic States, with the involvement of the Arctic Indigenous communities and other Arctic inhabitants on common Arctic issues, in particular issues of sustainable development and environmental protection in the Arctic.[3]

Member States of the Arctic Council are Canada, Denmark (including Greenland and the Faroe Islands), Finland, Iceland, Norway, Russian Federation, Sweden, and the United States of America.

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[1] The content of this paper is the responsibility of the author(s) and does not necessarily represent the views of the PAME Working Group as a whole, or its member countries. It was developed to support the Model Arctic Council (October, 2010, in Whitehorse, Yukon, Canada)

[2] A portion of this section is adapted from the Arctic Council's website. See www.arctic-council.org.

[3] A portion of this section is adapted from the Arctic Council's website. See www.arctic-council.org.

In addition to the Member States, the Arctic Council has the category of Permanent Participants. The category of Permanent Participation is created to provide for active participation of, and full consultation with, the Arctic Indigenous representatives within the Arctic Council. This principle applies to all meetings and activities of the Arctic Council.

Protection of the Arctic Marine Environment Working Group[4]

The Protection of the Arctic Marine Environment Working Group (PAME) is one of six Arctic Council working groups. PAME was first established under the 1991 Arctic Environmental Protection Strategy and was continued by the 1996 Ottawa Charter that established the Arctic Council.

PAME is the focal point of the Arctic Council's activities related to the protection and sustainable use of the Arctic marine environment. It has a specific mandate to constantly review relevant legal and policy details, and make recommendations for improvements that would support the Arctic Council's Arctic Marine Strategic Plan (2004).[5] It is the Arctic Council body that addresses policy and nonemergency pollution prevention related to the protection of the Arctic marine and coastal environment from land and sea-based activities.

PAME carries out activities as set out in work plans.[6] These activities led by PAME include circumpolar and regional action programmes and guidelines aimed at protection of the Arctic marine environment from both land and sea-based activities. PAME's 2009-2011 work plan lists its three objectives:

1. Improve knowledge and respond to emerging knowledge of the Arctic marine background;
2. Determine the adequacy of applicable international/regional commitments and promote their implementation and compliance; and
3. Facilitate partnerships, programmes and technical cooperation and support communication and outreach both within and outside the Arctic Council.

[4] A portion on this section is adapted from PAME's website. See www.pame.is.
[5] The strategic plan can be found at http://www.pame.is/pame-work-plan-2009-2011
[6] Arctic Council, *PAME Work Plan*, 2009-2011.

There are numerous activities that PAME is involved in. One important tool developed by PAME is the Arctic Council's *Arctic Offshore Oil and Gas Guidelines*. The most recent publication is the 2009 version.[7]

OIL AND GAS ACTIVITIES AND THE ARCTIC ENVIRONMENT AND SOCIETY[8]

A number of factors, alongside the significance of our changing climate, are driving a rapid increase in the exploration and development of arctic energy reserves. These include continued turbulence in the Middle East; the rise of international terrorism; a corresponding focus in the United States and European Union on energy security, including the security of supply lines; and a government in Russia that is focused on increasing and building its energy reserves. Add high oil and natural gas prices, and reserves in the remote north become more attractive exploit. In short, the current geographic and political climate is creating conditions that are making it more attractive to pursue resources in the Arctic.

Impacts to marine Arctic areas from human activity mainly affect coastal areas. Effects in these areas are mainly due to pollution and contaminants carried by wind and sea currents, and rivers, but also include pollution carried in sea ice.

Some coastal areas of the Arctic may be contaminated in various ways including by direct runoff from cities, villages, industry or mining, through river discharges, dumping and from nuclear tests. Hot spots where pollution occurs more frequently have been identified by the Arctic Council and other sources and are listed below. Persistent organic pollutants (POPs)[9] and mercury represent the greatest contaminant related threat to the Arctic environment; however,

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[7] Additional guidance and information resources that have relevance to the Arctic Offshore Oil and Gas Guidelines, have been provided by the Arctic Council since 2002, including the *Human Health in the Arctic Report* (2003), the *Arctic Marine Strategic Plan* (2004), the *Transfer of Refined Oil and Oil Products in the Arctic (TROOP) Guidelines* (2004), the *Arctic Shoreline Clean-up Assessment Technique (SCAT) Manual* (2004), the *Arctic Guide for Emergency Prevention, Preparedness and Response* (2008), the *Arctic Climate Impact Assessment* (2004), the assessment, *Oil and Gas Activities in the Arctic—Effects and Potential Effects* (OGA, 2009).

[8] A portion of this section is adapted from World Wildlife Fund's website, including the subsection 'Regions of Concern.' See www.panda.org or more information about WWF's International Arctic Programme. The subsections related to impacts are adapted from Arctic Council, Protection of the Arctic Marine Environment Working Group, *Arctic Offshore Oil & Gas Guidelines*, 2009.

[9] Persistent Organic Pollutants (POPs) is a term which covers over a dozen different chemical substances that persist in the environment, accumulate through the food chain, and cause damage to animals and humans. Most POPs were used as pesticides, in the industrial processes or in the production of a range of goods such as solvents or pharmaceuticals. Though there are a few natural sources of POPs, most POPs are created by humans in industrial processes, either intentionally or as byproducts.

global restrictions and bans on their production and use have had a positive impact, with levels of POPs continuing to decline in recent years.

On the other hand, new chemicals are being measured at increasing concentrations in the Arctic marine environment. Levels of mercury in the marine environment from long range transport appear to be increasing, particularly in the North American Arctic. At higher tropic levels, both POPs and mercury are found at levels that pose a potential risk to wildlife.

Currently, the vast majority of the Arctic marine environment that is away from local natural or human sources is largely unspoiled with regard to oil and gas. Physical disturbance due to exploration activities has declined over the last twenty years as a result of improvements in technology and use of best practices.

Climate change presents numerous challenges to arctic marine environments and ecosystems. Climate change will also influence contaminant pathways and processes resulting in changes to current levels in the marine environment. Increased offshore activities may disturb marine life with their presence, noise, and discharges. These are all serious concerns that will impact oil and gas activities in the near- and long-term.

Oil and Gas Activities

There are many facets to the petroleum industry. It is an industry that touches almost every aspect of our lives. Oil and gas activities, in particular, provide jobs, energy and wealth to many national economies and their populations; this, of course, includes the countries of the Arctic. Here are a few examples of what oil and gas activities include:

- Seismic exploration
- Rig emplacement
- Exploration drilling
- Facility installation
- Transportation
- Pipeline installation
- Production drilling
- Oil and gas production
- Removal of installations

With such diverse operations, oil and gas activities, like most industries, will leave some sort of footprint. In certain examples, such impacts can have a negative effect on the natural and human environments.

The thinning of the Arctic ice over the past three decades has opened the region to increased oil and gas exploration. This is not surprising since the U.S. Geological Survey has estimated the undiscovered potential of the Arctic to be 90 billion barrels of oil and 1,669 trillion cubic feet of

natural gas. In North America, oil companies are investing billions in exploration while Russia and Norway are operating or developing new facilities such as the large Snøhvit liquefied natural gas plant (Norway) or Gazprom's Shtokman gas and Prirazlomnoye oil fields and Lukoil's Varandey transhipment terminal in the Barents Sea (Norway and Russia).

As oil exploration and development continues and as new icebreaking oil and natural gas tankers are built it seems certain that the risk of oil spills in the Arctic will increase – either from an accident on an offshore rig or aboard a tanker traveling trough Arctic waters.

Impacts on the Natural Environment

The Arctic Council Oil and Gas Assessment (2008) found that a significant threat from offshore oil and gas activities could have an impact on vulnerable areas crucial to habitats or threatened species. Oil spills are particularly dangerous to the Arctic environment. Spilled oil kills birds, fish and sea mammals and contaminates the food chain. Because of the low temperatures and the slow rate of decomposition, oil spilled in the Arctic breaks down at an incredibly slow rate. Plant life in the North is also more seriously affected since the cold temperatures allow it to grow back only over long periods. Spills in the Arctic would thus be more damaging and much longer lasting than an identical spill anywhere else in the world.

The impacts of such an event are still not fully known. Little is known about the effects of oil spills on species that are unique to the Arctic or how well the environment could recover. Cleaning up such an event in the North would also be very difficult and there is still no effective way to do so. Most response techniques call for rapid action – a difficult option in a region so far from most infrastructure. Twenty years of data on responses to spills in the Aleutians has shown that cleanup attempts to even small spills have been difficult or impossible.

The SS Manhattan was the first oil tanker to transit the Northwest Passage in a 1969 test.

Offshore oil and gas activities may involve considerable inputs of gases into the air. These emissions contribute greenhouse gases to the atmosphere and increase the amount of pollutants emitted to the Arctic; thus potentially affecting the climate and possibly causing acidification on nearby land. Although not widely practiced in the Arctic, discharges of drill cuttings[10] with

[10] Drill cuttings refers to any material (typically called solids) removed from a borehole while drilling petroleum wells.

associated oil and chemicals and discharge of produced water may have acute effects on sea floor flora and fauna, and reduce both their abundance and diversity in the immediate vicinity of the drill cutting installations.

Good and transparent governance, comprehensive but responsive regulatory regimes, and the use of international standards and practices coupled with evolving advances in technology and best practices have lessened the effects of oil and gas activities over time, including those in the offshore. But risks may arise as conditions change or new areas are explored and developed. Evidence shows that accidents will happen and best practices will not always be followed.

The accelerating loss of polar sea ice has drawn the attention of nations and industry for the possibility of increased oil and gas and shipping activities in their arctic waters. Therefore, all stakeholders share a concern about future oil and gas development in this changing and fragile environment and in dealing with the impacts and stresses both from direct environmental risk and those posed by climate change.

Impacts on the Human Environment

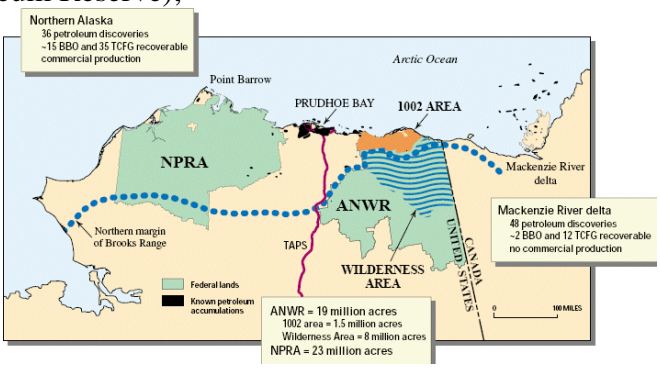
Oil and gas activities may have significant positive effects on a nation's employment and economy. They also have socio-economic effects, both negative and positive, on local communities and indigenous people. The Arctic Council Oil and Gas Assessment (2008) also found that social effects of oil and gas activities, including those offshore, are often most felt at the local level, while the economic effects are often shared more widely; therefore local populations feel the negative effects of oil and gas activities more intensely than others. The scale of industry activities has increased alongside the value oil and gas. The impacts have been both positive and negative. It seems that the socio-economic impacts are greater during the initial stages of oil and gas activities (ex. exploration, construction, etc.). Expansion of oil and gas activities across the Arctic has increased the overlap and potential conflict between the industry and traditional land use and ways of life of indigenous people. Oil and gas activity create a constant potential for interfering with traditional marine subsistence hunting and fishing activities.

At the same time, in many Arctic countries, indigenous people are becoming active participants in oil and gas activities as decision makers, business owners, and employees. In addition to direct effect of oil and gas activities on indigenous communities, more consideration is being given to indirect impacts from oil and gas activities. These could include impacts on human health from changes in diet resulting in an increased risk of diabetes, obesity, hypertension, and cardio vascular disease, or social strain and potential for increased access to drugs and alcohol from contact with outsiders leading to higher risk of social pathologies.

Regions of Concern

According the World Wildlife Fund (WWF), petroleum development and transport pose particular threat to four of the Arctic's 11 ecoregions. They include:

- the Alaskan North Slope Coastal Plain ecoregion (Arctic National Wildlife Refuge and National Petroleum Reserve);



Map 1. Northern Alaska.

- the Barents/Kara Sea ecoregion;

Map 2. Barents and Kara Seas.

- the Canadian Low Arctic Tundra and Canadian Boreal Forests ecoregions (the Mackenzie River Valley and Delta); and,

Map 3. Boreal Forest's International Boundaries.

- Oil and gas development is a major threat in subarctic Sakhalin, which lies in the Russian Far East ecoregion.

Map 4. Eastern Russia.

Oil and gas development is also very likely to be a medium-term threat in other arctic ecoregions. These include the Taimyr Siberian Coastal Tundra ecoregion, the Fenno-Scandian Mountains ecoregion, the East Siberian Taiga ecoregion, the Chukota Coastal Tundra ecoregion and the Bering/Beaufort Seas ecoregion (including the Canadian Beaufort Sea).

The potential impacts listed, as well as the fragility of certain regions within the Arctic geography, will need to be considered by all stakeholders as the future develops.

Case Study: The Canadian Low Arctic Tundra

The Canadian Low Arctic Tundra is located on top of the Canadian Shield, a vast and ancient expanse of crystalline rock that stretches for thousands of miles. The ecoregion is crisscrossed with numerous streams and lakes. Sparse, varied vegetation grows for just two to four months during the warmest time of year. Vast herds of migratory caribou live entirely in this ecoregion. Packs of arctic wolves follow and prey on the herds as they move from their wintering grounds to their summer calving grounds. Wolves and caribou have interacted like this for thousands of years, making the Canadian Low Arctic Tundra one of the few places in the world where you can still see large mammal predator/prey populations that are so closely linked.

General threats to arctic regions apply, such as atmospheric fallout resulting in heavy metal and pesticide pollution. There is a risk of site-specific oil and chemical spills, and tailing effluent escapes. Mining is a rapidly growing industrial threat in parts of this ecoregion, especially with respect to diamonds and copper. Associated road building is in the planning stages and may be a significant threat for some species and habitats. Ecotourism will need to be carefully managed in order that nesting bird colonies, caribou calving grounds and other sensitive wildlife species are not disturbed. With increased access, over-hunting of caribou is a possibility and commercial harvesting of both caribou and muskoxen needs to be carefully monitored and controlled. In addition, carnivore deaths resulting from human defense and nuisance kills (especially for wolverine (Gulo gulo) and grizzly bears) may further impact predator-prey dynamics.

This sensitive landscape is impacted not only by oil and gas activities but by human activity in general. It is only through the application of sustainable development approaches that resource extraction will be reconciled with the maintenance and preservation of this example of pristine Canadian wilderness.

ARCTIC STAKEHOLDERS

With a complex network of local, regional and international institutions and stakeholders, Arctic governance will continue to be challenging. The layers of stakeholders have created an environment where longer-term approaches really help with the health and viability of a prosperous Arctic. The Arctic Council has played a leadership role within this context but there are also many other stakeholders that come together to form the Arctic community. Groups and organizations that are active in building the Arctic's future include:

- Indigenous and local communities (Arctic Athabaskan Council, Inuit Circumpolar Commission, etc.)
- Intergovernmental organizations (ex. Arctic Council, United Nations, etc.)

- Governments (ex. Russia, Norway, United States of America, etc.)
- Industry and multinational corporations (ex. ConocoPhilips, Gazprom, etc.)
- Industry lobbyists (ex. Arctic Power, etc.)
- Nongovernmental organizations (ex. World Wildlife Fund, Pembina Institute, etc.)
- Academia (ex. University of Alaska Coastal Marine Institute, etc.)

The Arctic Council and PAME contribute to good governance within this complex stakeholder network. The strategies and practical tools that are supplied by the Arctic Council provide a common standard and predictability within the complexity that defines the landscape.

THE CURRENT DISCOURSE AND QUESTIONS TO CONSIDER

Within the arctic stakeholder network there has been a growth of rule-based (ex. guide lines, laws, policies, etc.) as opposed to power-based (ex. economies, militaries, etc.) interactions among countries and other stakeholders. The permanence of this 'trend' however is debatable.

The international significance of the Arctic has remained latent under millennia of ice. Today, as our planet warms and arctic ice recedes (and in certain areas completely disappears), a whole new landscape is emerging. Within this geographical transformation, the issue has taken on a new look and feel. Here are a few recent media headlines regarding the future of the Arctic:

- *Obama sets sights on Arctic oil and gas exploration* (Canwest News Service, Mar. 31, 2010)
- *Who will win the race to develop the Arctic?* (Energy and Capital, June 17, 2009)
- *Gazprom counts on Arctic bonanza* (Upstream Online, Jan. 22, 2009)
- *Russia warns of war within a decade over Arctic oil and gas riches* (The Times, May 14, 2009)

In the coming decade, the Arctic Council, PAME, and all the Arctic stakeholders will face new challenges as the most powerful countries in the world come head-to-head over strategic resource issues. Increased activities will further emphasize the necessity of good governance. From land disputes to oil and gas rights, international organizations will be one of the forums where the changing Arctic discourse will be witnessed. The Arctic Council and PAME will be active participants in this evolution.

There are numerous questions that flow naturally out of a review of arctic oil and gas activities and the role of international organization. Here are a few examples to consider:

Q. What relationship will technology have in future arctic oil and gas activities?

Q. How will outside forces including Oil and Gas companies influence the work of the Arctic Council, PAME, and international organization?

Q. How can the Arctic Council balance the need to protect the Arctic marine environment with the growing need for oil and gas in people's daily lives?

Q. Are the economic advantages of developing the North worth the negative effects of oil and gas activities on the natural Arctic environment?

Q. Could economic development be conducted with acceptable levels of pollution?

Q. Who should be responsible for determining who can drill for oil in Arctic areas?

Q. Should the Arctic Council play a larger role in influencing the agendas and regulations of independent states or is that best left to individual governments?

Q. What political or environmental changes threaten to increase pollution in the Arctic?

Q. How could the Arctic Council expand or strengthen its influence over state policy regarding oil and gas activities?

Q. How do you balance the social, economic and environmental effects of oil and gas activities in the Arctic?

SUGGESTED READING AND LINKS

Arctic Council, *Arctic Marine Strategic Plan, 2004*
http://www.pame.is/arctic-marine-strategic-plan

Arctic Council, *PAME Work Plan, 2009-2011*
http://www.pame.is/pame-work-plan-2009-2011

Arctic Council, *Arctic Offshore Oil and Gas Guidelines*, *2009*
http://arctic-council.org/article/2009/6/updated_oil_and_gas_guidelines

World Wildlife Fund: Oil and Gas in the Arctic
http://www.panda.org/what_we_do/where_we_work/arctic/what_we_do/oil_gas/

Pembina Institute: Arctic Energy Solutions
http://arctic.pembina.org/oil-gas