

Master's thesis



**Iceland as an Oil State:**  
Identifying and Analyzing the Risks and Opportunities  
Presented by the Dreki Area

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*Iceland as an Oil State: Identifying and Analyzing the Risks and Opportunities Presented by the Dreki Area*

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## **Declaration**

I hereby confirm that I am the sole author of this thesis and it is a product of my own academic research.

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# **Abstract**

Exploration of oil and gas reserves on Iceland's continental shelf is currently underway, particularly concentrated in the northeast's Dreki area. This study systematically analyzes ecological, economic and legislative baselines in order to present managers with a nuanced understanding of the risks and opportunities associated with developing the area. This study uses document analysis and stakeholder interviews to integrate original ethnographic data with existing secondary literature. Respondents identify what they view as the most important and divisive questions concerning exploiting the Dreki area's resources. Discussions of the area reveal broader concerns regarding Iceland's future as a producer of non-renewable energy, perceived regional inequities within the nation, and the impact of the international community on decision-making within Iceland.



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# List of Acronyms

CBD – Convention on Biodiversity

CLCS – Commission on the Limits of the Continental Shelf

DPEA – Durban Plan for Enhanced Action

EEZ – Exclusive Economic Zone

EIA – Environmental Impact Assessment

IMO – International Maritime Organization

MARPOL – International Convention for the Prevention of Pollution of Ships

NEA – National Energy Authority

NGO – Non-Governmental Organization

OSPAR – The Convention for the Protection of the marine Environment of the North-East Atlantic

PAME – Protection of the Arctic Marine Environment (working group of the Arctic Council)

SEA – Strategic Environmental Assessment

UNCLOS – United Nations Convention on the Law of the Sea

UNFCCC – United Nations Framework Convention on Climate Change



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# 1 Introduction

Iceland's Dreki (Dragon) area is a region to the northeast of the island, in which oil and gas are believed to abound (Carstens, 2011). Licenses have already been granted for the first commercial explorations of the area (Orkustofnun, 2013). But there is a dispute over whether to exploit oil and gas reserves in the Dreki area, and there are unanswered questions on a number of points; these are simultaneously environmental, political and ethical. This entangled set of concerns includes political and theoretical ones, and represents tangible impacts on rural communities. These also influence the Icelandic economy and natural environment. Nevertheless two of Icelandic municipalities closest to the area—Vopnafjörður and Langesbyggð—have already put up a website tailored toward oil companies that touts the many services they have to offer (Dreki Area Amenities, 2013), while environmentalists have published work warning against the prudence of ever tapping this oil (Elísson, 2012).

The issues in the Dreki area can be divided along five axes. They are (1) environmental, concerned with the very specific and tangible impacts of the project on biota in the region. On another level they are cultural, in that they represent (2) a conflict between traditional and progressive commercial uses of the same space—a long established fishery and a relatively new use of offshore petroleum deposits. In another sense the dispute is structured around where decision making happens (3) between long-term conservation efforts and the more immediate benefits of economic expansion. It is also (4) a question of international and domestic governance in an era of increasingly trans-national sovereignties. The existence and influence of trans-national institutions like the Inuit Circumpolar Council and the Arctic Council questions the primacy of the nation-state in making decisions that have direct and immediate regional implications as well as indirect and delayed global consequences (Fraser, 2009). Conflicted global priorities regarding fossil fuel consumption complicate the ability of a single state to make unilateral decisions regarding fossil fuels. Finally, (5) outcomes in the Dreki area will serve to further establish the trajectory of Iceland's future.

Harsh environmental conditions in the Arctic present special challenges that push the limits of what reserves may be tapped both technologically and economically. Existing deepwater wells, especially in the Gulf of Mexico, have demonstrated that it is possible to recover deep offshore hydrocarbons in a profitable way (Kaiser, 2011), but these activities are considerably more costly and dangerous than their terrestrial counterparts. Both marine and terrestrial ecosystems throughout the Arctic are particularly susceptible to disturbance from hydrocarbon production; with the cold environment providing limited growing seasons and extremely slow recovery times for any disturbed ecosystem, resilience is low (Powell, 1991). The effect of a major spill anywhere on Iceland's continental shelf could have catastrophic impacts on fisheries, conventional ways of life, and the marine ecosystem.

In the Dreki area and many other areas of the Arctic, baseline data are incomplete. The absence of adequate scientific knowledge renders highly effective management difficult (Tompkins & Adger, 2004). Surveys of the benthic environment in the Dreki area are ongoing, and new discoveries from very recent studies suggest that more work will continue to improve knowledge of what organisms might be affected by exploiting the area's oil reserves (Fossum, et al., 2012). On this level, the dispute over the Dreki area is the question of whether the cost or risk to the natural environment of a particular commercial activity is acceptable in the face of the potential benefits.

The clash between new industry and the long-standing capelin and herring fisheries in the Dreki area serves to highlight the contrast between traditional commercial uses and expanding new opportunities. The forage fish that are harvested in the region comprise an appreciable portion of the fishing industry in the area—and with fishing remaining the largest industry in Iceland as a whole, impacts on fisheries are of significant concern (Matthíasson, 2003). Adding hydrocarbon production could also add economic diversity, but it does so in a way that poses environmental threats as well as challenges to traditional uses of marine resources.

Fishing is an integral part of the Icelandic national identity. Fisheries serve not only to connect the terrestrial population to marine resources, but also form an intergenerational bond that connects present generations to a thousand years of maritime history. The vitality of that connection imbues the present fishing industry with a cultural importance



that supplements the economic benefits it provides in ways that cannot be quantified in fiscal terms (Pálsson, 1994). Yet recent decades have seen a shift away from careers in fishing for a younger generation that sees those occupations as limiting and less desirable than others (Karlsdóttir, 2008). Both fisheries and petroleum extraction represent partnerships between government and non-governmental actors, working to utilize the natural resources that Iceland possesses for the benefit of the general population. But these activities differ substantially in the cultural product they also offer. Although oil and gas may add more to the national treasury than fisheries, they cannot take the place of traditional uses of the sea. Benediktsson & Karlsdóttir (2011) argue that despite a move away from fishing in the younger generation, reforming and improving the management of fisheries in Iceland will continue to be a priority for policymakers. In this sense the Dreki area dispute is concerned with deciding how tradition and innovation will be balanced, but from a position in which nearly 19% of labor in fishing in 2005 was made up of migrant work (Karlsdóttir, 2008, p. 108).

As a non-renewable resource, oil and gas reserves differ fundamentally from renewable resources, and their use must be managed differently. As of 2010, 87% of world stocks were fully exploited or overexploited (FAO, 2012, p. 11). Careful management can affect the restoration of depleted fish stocks, but hydrocarbons do not follow this model; given their finite nature it is necessary to manage the rate at which they are extracted and the extent to which they should be left untouched for future users. This is an issue both of intergenerational equity and economic prudence (Hotelling, 1931; Solow, 1974).

Concepts of political ecology have been firmly embedded in Icelandic consciousness of environmental issues. Pálsson and others have explored this notion in depth with regard to the fishing industry, highlighting the robust but shifting cultural and political significance of Icelandic fisheries (Karlsdóttir, 2004; Skaptadóttir, 2000; Durrenberger & Pálsson, 1996; Pálsson, 1994). Concern over the consequences of drilling in the Dreki area is real, but to the extent that it is a call to action it is a political idea. Public concern with regional economic equity as a cause of environmental conflict supports Peet and Watts' (1996) counterintuitive assertion that "...impoverishment is no more a cause of environmental deterioration than its obverse, namely affluence/capital" (p. 7). The specific impacts that a spill or no spill would have on flora and fauna in the marine environment

appear as secondary issues, following only at some distance the more central questions of political efficacy, domestic governance and national prioritization. The central issue is not whether it is possible to manage this project well, but whether it can be done sustainably and in agreement with the international conventions that pertain to the use and production of oil and gas. Public response is washed in the rhetoric of ecosystem integrity, but finds its rigor in its identity as a political priority that stands in contrast to dominant push of economic expansion and capital gains.

The Dreki area's political contentiousness is locally rooted in a demographic issue and more broadly situated in international precedent. Rural communities in Iceland are dwarfed by the much larger population of Reykjavik and the surrounding municipalities that together comprise the capital region. Reykjavik and nearby towns are home to the overwhelming majority of Iceland's government and non-governmental institutions, commercial stakeholders and economic activity. As a result, the power of rural Icelanders to decide for themselves how to develop resources has frequently been questioned in those communities (Auth, 2012), and has been contentious in a number of megaprojects in rural Iceland and elsewhere in the north (Jóhannesson, Robaey, & de Roo, 2011).

Within Iceland as a whole, the project represents a broader conflict over the responsibility of the nation within the international community. The push to develop these reserves stands in contrast to the rhetoric of several international conventions and protocols to which Iceland is party. The United Nations Framework Convention on Climate Change (UNFCCC) and its subsequent iterations call for dramatic reductions in greenhouse gas emissions. Iceland, an Annex 1 party to that convention, shares the agreed-upon responsibility to take precautionary measures, even where the science is not fully established, to limit their production of greenhouse gasses.

## **1.1 Research Question and Purpose of this Thesis**

### **1.1.1 Purpose**

Iceland's recent move toward offshore hydrocarbon production is controversial, and raises questions along the lines outlined here. The overall purpose of this thesis is to identify and analyze the opportunities, concerns, and risks associated with developing the Dreki area. First it identifies the complex set of issues surrounding the

Dreki area in a systematic way that will facilitate good management and future scholarship. Previous work on the geology of the region has already been done, and economic studies of the proposed activities are ongoing. I include environmental baselines and descriptions of policy and legislation in greater depth to clarify and compliment the human questions being addressed.

Secondly, this project aims to highlight the process and importance of integrating environmental and ethnographic data for effective resource management. Other literature—the Dreki area’s Strategic Environmental Assessment (SEA) in particular—have already cataloged the environmental risks and rewards associated with development. The uniqueness of this thesis consists in its focus on human impacts and perceptions of the area, and the incorporation of ethnographic data obtained directly and through stakeholder interviews.

Thirdly, this project is intended to add to the English-language literature on offshore oil and gas production in Iceland. The body of existing literature on petroleum opportunities in Iceland is almost exclusively aimed at commercial interests. Little has been published on the Dreki area thus far; this thesis aims to contribute to a literature on effective management of the area by articulating the opportunities and risks in a comprehensive and anthropocentric way.

### **1.1.2 Research Questions**

In order to fulfill the stated purpose of this thesis, the project addresses two key research questions:

- (1) What are the environmental, social and economic opportunities and risks presented by Iceland’s new oil industry?
- (2) What are the most significant opinions of the project’s stakeholders, both in favor of and opposed to development?

## **1.2 Structure**

This thesis seeks to systematically present data to inform effective management of the Dreki area, and to do so in a way that integrates the opinions of a diverse group of

stakeholders. Chapter 2 discusses how this study utilizes definitions and examines the fluidity that those definitions take on in being applied; the chapter also discusses methodology and limitations of the study. Chapter 3 describes the environmental conditions in the area, looking both at the specifics of the Dreki area itself and general conditions of the Arctic. Chapter 4 traces the recent history of geological explorations in the area, aiming to present a clear view of what is known about the regions oil reserves. The probable extent of the reserves provides a general indication of how the economics of the region are likely to unfold. Chapter 5 examines the policy framework surrounding the Dreki area, including forms of governance that are local, national and international. Chapter 6 analyzes major themes in interviewee's discussions, considering each in light of the information presented in previous chapters. Finally, chapter 7 aims to pull fill in additional discussion and conclusions that are not covered in individual chapter conclusions.

## **2 Methodology**

This study precisely defines the location and extent of the Dreki area as a geographic zone in chapter 3. This study uses the term to refer to the area dubbed 'Dreki zone' by Orkustofnun (National Energy Authority), but is also occasionally used describing the slightly larger area in which fishing and oceanographic processes take place that have a direct impact on the area. Oil and gas reserves that are described as being in the Dreki area refer only to those reserves that would be covered under the licensing blocks offered. Activities such as fishing and physical processes like currents moving in and around the area are referred to as 'in the Dreki area,' in reference to their direct impact on the specific area, whether or not they occur entirely within the license area.

This thesis presents potential oil extraction in the Dreki area as being in 'dispute,' presenting 'issues,' and being a debate, although this adversarial vocabulary is largely absent from existing literature in the area. The use of this terminology here is done with reference to the descriptions of the area provided by interviewees; respondents' descriptions of the dialogue surrounding the area were not all in agreement, and the majority readily offered adversarial descriptions of the interaction between industry and environmental precaution. 'Issues' as used throughout this thesis is intended to refer to the

features of this activity on which better or worse management could be affected. It is used to denote topics that policy addresses, and not to suggest that the results of oil production in the Dreki area are necessarily negative.

## **2.1 Scoping**

One of the initial challenges of defining a concrete set of management directives for a project like this one is limiting its scope. In regards to the Dreki area, attempts to pin down exactly who are the stakeholders and which parties are not stakeholders reveals the largely hypothetical and nebulous nature of that list. The timeframe, scope, environmental impacts and economic ramifications of the project all serve to add or subtract from the list of affected parties. Throughout this thesis an attempt is made to include as many potential and actual stakeholders as possible, while acknowledging that not all are going to be tangibly impacted by drilling in the area.

In any future scenario for the area, the issue appears different at the varied spatial scales. As is described above, there are concerns to be addressed at an extremely local level; these include direct impacts on benthic organisms and migratory birds, among others. On the far other end of the spatial spectrum, whether or not Iceland *should* prioritize oil production is a question of national commitments and global direction. This study makes a significant effort to highlight the interrelations between dialogues happening at different spatial scales, seeking to fully integrate disparate types of data and levels of governance.

## **2.2 Data**

There are several sets of data used throughout this study, interwoven through each of the chapters. The first is the existing English language literature on the Dreki area. There is somewhat more available in Icelandic, particularly media pieces that cover the area or comparable projects at Kárahnjúkar, but a considerable portion of what has been published by the involved government and industry parties has been produced in or translated into English. These sorts of documents include feasibility studies (SAGEX, AS, 2006), the project's Strategic Environmental Assessment (Ministry of Industry, Energy and Tourism, 2007) and other technical documentation on the area. Second is the body of regional and global agreements that have ramifications for oil exploration and production, and that

Iceland has agreed to. Third is the ethnographic data gathered spending approximately one year living in a small Icelandic community, and the data obtained by conducting semi-structured interviews with a diverse set of stakeholders.

### **2.2.1 Interviews**

In addition to the ethnographic data obtained living in Iceland, seven semi-structured interviews were conducted that focused specifically on management of potential oil production from the Dreki area. These interviews were intended to supplement the more general perspectives of Icelanders on the environment and their nation's interaction with it by concentrating on the Dreki area itself. Further, the perspectives of the respondents serve to compliment the information presented here and broaden the scope of this thesis beyond the ecological and policy data presented in chapters 3-5. Respondents were selected based on their knowledge of and interaction with the Dreki area, northeast Iceland, and their willingness to participate in interviews on the debate surrounding it (Table 1). While not all interviewees requested that their identities be kept confidential, several asked to be kept secret. Though the number of those surveyed is small, their roles cover a wide range of stakeholder uses, and the comprehensiveness of their concerns and interests in the Dreki area is confirmed by the breadth of topics they raised.

The respondents interviewed collectively represent the perspectives of residents of both Reykjavik and rural communities in Iceland, as well as professionals working in the oil industry, fisheries science, media, environmental NGOs, and academic settings (Table 1). Interviews were conducted via telephone between October 2012 and March 2013. On average, conversations spanned between a thirty and forty-five minutes, allowing time for 6-10 direct questions and time for open discussion. At the request of several respondents, the identity of interviewees has been kept confidential.

Semi-structured interviews were selected in order to allow respondents the opportunity to highlight the issues that they feel are important, with minimal prompting on the part of the interviewer. The questions that were asked called for the interviewee to describe their impressions of the Dreki area's social impacts, the environmental risks, the economic benefits and the motivation behind exploring in the Dreki area. These differed with each respondent in order to retain adequate flexibility to highlight the specific issues they saw as most important to the conversation. Despite variation between interviews, all

respondents were questioned about who they view as the main beneficiaries from Dreki area oil would be, whether environmental concerns were adequately answered, how public the debate had been, whether the fishing industry is in conflict with oil and gas, and how being an oil state alters Iceland's energy future.

*Table 1: Anonymized Interviewees*

| Alias        | Location       | Gender | Stakeholder Status  |
|--------------|----------------|--------|---|
| Respondent A | Reykjavík Area | M      | Energy Industry Representative.                                 |
| Respondent B | Reykjavík Area | M      | Employed by an Environmentally-focused NGO.                     |
| Respondent C | Akureyri       | F      | Researcher studying rural communities throughout the northeast. |
| Respondent D | Ísafjörður     | M      | Researcher concerned with marine transport around Iceland.      |
| Respondent E | Egilsstaðir    | M      | Journalist  |
| Respondent F | Egilsstaðir    | M      | Politician and Lawyer   |
| Respondent G | Akureyri       | M      | Fisheries Biologist   |

## 2.3 Limitations

The language barrier presented my limited understanding of Icelandic represents the most significant limitation in this study. Although as mentioned above, a significant portion of the relevant documents and policies are available in English, there is a level of comprehensiveness that was not possible outside of the original language. The language gap also limited the pool from which interviewees could be drawn, although fortunately there are an abundant number of knowledgeable individuals engaged with the latest developments in the Dreki willing to be interviewed in English.

The relatively small number of respondents is another limitation in this study. The size of the group of interviewees is a function of the limited timeframe within which this study had to be conducted, my own inability to conduct interviews in Icelandic and the overall small number of people with specific knowledge of the Dreki area. These factors

are partially mitigated by the significant diversity of the respondents that were contacted. Despite their being few in number, the individuals polled represent a broad cross section of interests and backgrounds.

Finally the lack of existing literature with similar objectives to this thesis is a limitation in the sense that it renders the task of clearly defining how this thesis fills an existing knowledge gap more difficult. Provocative work that questions the wisdom of extracting Dreki oil is limited—although the question has been publically raised this year (Elísson, 2012)—and private party assessments of the environmental stakes are similarly absent. This lack of precedent is a limitation only insofar as it limits the possibility of situating this thesis within an existing body of literature.



## **3 Environmental Context**

The environmental conditions of the Dreki area are uniquely challenging both because of its location in the Arctic, and the depth of its potential reservoir. Understanding the physical conditions of the Dreki area highlights in part the ecosystems that are threatened by petroleum activities, and the baseline cultural and aesthetic conditions which frame human impacts that the project may have.

### **3.1 Conditions in the Arctic: Resilience, Sensitivity and Change**

Arctic ecosystems are highly interconnected, particularly susceptible to disturbance and slow to recover (Overpeck, et al., 1997). Temperature extremes and limited exposure to daylight limit growing seasons, and render both terrestrial and marine ecosystems more sensitive than their warmer counterparts. These biomes are home to numerous species endemic to the Arctic region however, and provide transient habitat to migratory stocks as well. Polar bears, abundant seabirds, several species of whales rely on the integrity of the Arctic environment. In addition, commercially significant stocks of pelagic, benthic and forage fish exist throughout the Arctic, and are particularly plentiful along the Jan Mayen ridge (Fossum, et al., 2012).

Despite being remote in terms of human settlements, the ecosystems services provided by Arctic regions have meaningful impacts on global environmental conditions. Boreal forests in the land areas surrounding the Arctic Ocean are a huge-scale carbon sink, and in addition to being habitat for Arctic fauna are crucial habitat for a variety of Arctic mammals (Lloyd & Fastie, 2002). Both abundant native fauna and reliable sea-ice conditions are fundamental to the preservation of indigenous ways of life in the Arctic (Inuit Circumpolar Council, 2008).

In spite of the known importance and sensitivity of the Arctic, the region remains less well-understood than many other ecosystems (Hinzman & al., 2005). Evidence of climate change around the north highlights the need for increased understanding of baseline conditions (McCarty, 2001), and demonstrates that the effects of hastening climate change are even more pronounced in high latitudes than in many others (Lloyd & Fastie, 2002; Inuit Circumpolar Council, 2008).

Change is occurring in the Arctic, some of which is either directly or indirectly driven by global climate change. Increased understanding of the influence of climate change on the complexity of arctic systems is essential for the adaptation of human social, economic, and cultural systems to the changes taking place in the Arctic. (Hinzman & al., 2005, p. 287)

Natural variability does contribute to the large-scale shifts that are taking place in the region, anthropogenic pressure is accelerating those changes, but recent decades have seen dramatic changes throughout the Arctic (Overpeck, et al., 1997). Whether the primary driver of ecological shifts is anthropogenic or otherwise is immaterial however, in light of the real consequences of those shifts. These consequences pose real threats to the inhabitants of the Arctic, both indigenous and non-indigenous (Øseth, 2011).

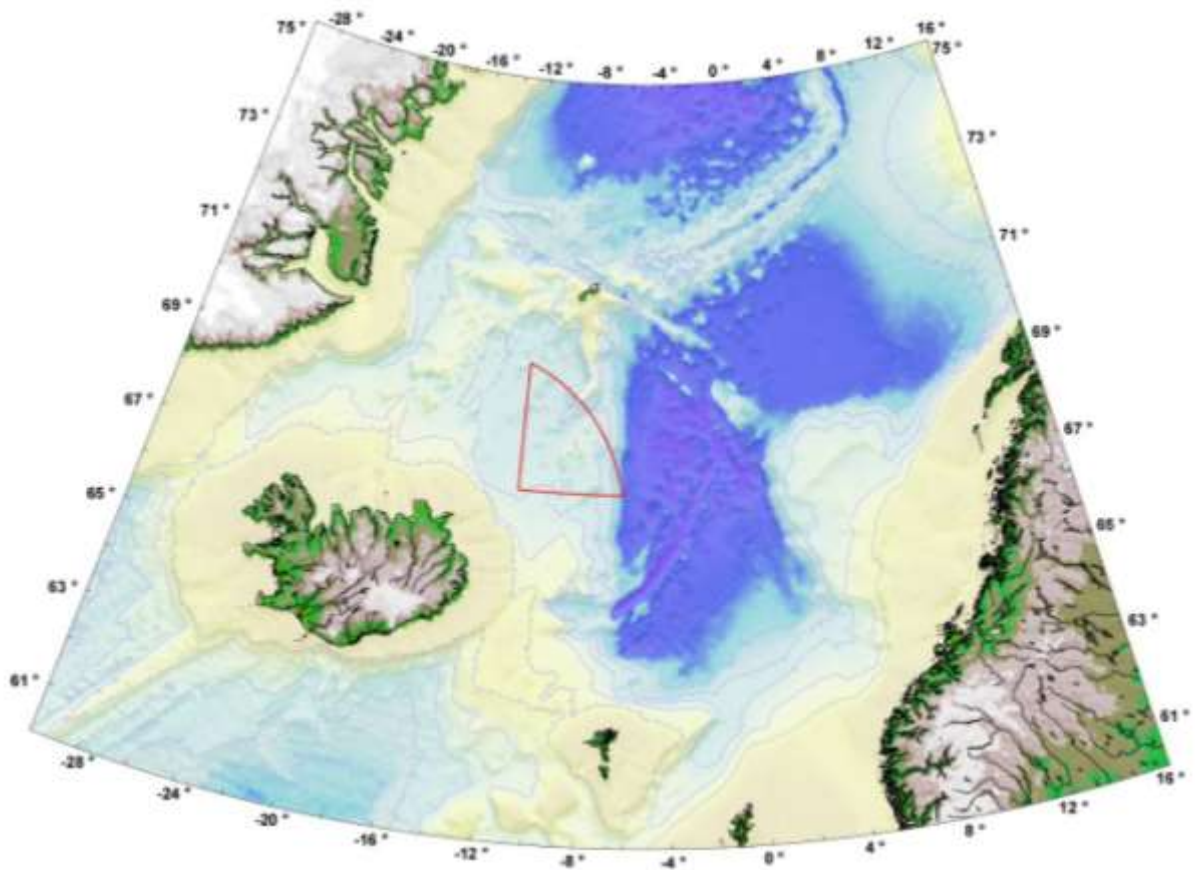
Planning for the conservation of a particular species or communities should take into account the fact that climate change is ongoing. The assumption that conditions in the historic range of a species are still present will increasingly be challenged. (McCarty, 2001, p. 327)

Against the backdrop of the issues facing the Arctic as a whole—both those wrought by recent shifts in climate and those inherent to the delicately balanced polar region—the specific environment of the Dreki area presents a more or less undisturbed study. While not entirely untouched, the region has so far been largely left in its pristine condition. Much of what is the case with regard to the Arctic as a whole—ecological sensitivity, fully integrated ecosystems and *inter alia* hastening climate change—are critical issues in the smaller context of the Jan Mayen Ridge and the Dreki area itself.

## **3.2 The Dreki Area**

The Dreki area is located to the northeast of Iceland. It is the area north of 67°N and west of 11.5°W, bounded by the extremity of Iceland's Exclusive Economic Zone (EEZ). The region is comprised of approximately 42,700km<sup>2</sup> of Open Ocean, and contains no exposed land. At its nearest, the area is nearly 95 miles from the coastline, where the nearest Icelandic town is Þorshöfn, in Langanes.

The area is located squarely within the Iceland Sea, just inside the Arctic Circle, and in addition to very probably concealing commercially significant oil and gas reserves it is a region of oceanographic significance (Spectrum, 2012). Not far the limits of wintertime sea-ice, the Dreki area covers an area in which colder masses of polar water mix with the North Atlantic. Abundant zooplankton give rise to ample schools of forage fish, and their pelagic and Cetacean predators abound (Astthorsson, Gislason, & Jonsson, 2007). Sea birds of numerous species pass through the area (Joiris, 2011), while a complex system of ocean currents continually supply nutrients to the biota in the area while integrating it into the adjacent ecosystems (Stefánsson & Ólafsson, 1991).



*Figure 1: Location of the Dreki Area relative to Iceland, Norway, Jan Mayen and Greenland. (Orkustofnun, 2012).*

### 3.3 Physical Environment

Baseline environmental conditions in the Dreki area have been studied, and have been incorporated into the area's SEA and early feasibility studies. Average temperatures are below 10°C and visibility is a concern in summer, but there is a low probability of pack ice and wave heights that are lower than comparable Norwegian fields (Ministry of Industry, Energy and Tourism, 2007). Average wind speeds are also moderate enough to not present significant impediments to petroleum activities in the area; ongoing projects in the Barents Sea have demonstrated the technological feasibility of accommodating similar meteorological conditions (SAGEX, AS, 2006). Though the bathymetry of the Dreki area is varied to a considerable degree, the depths of presumed deposits range from

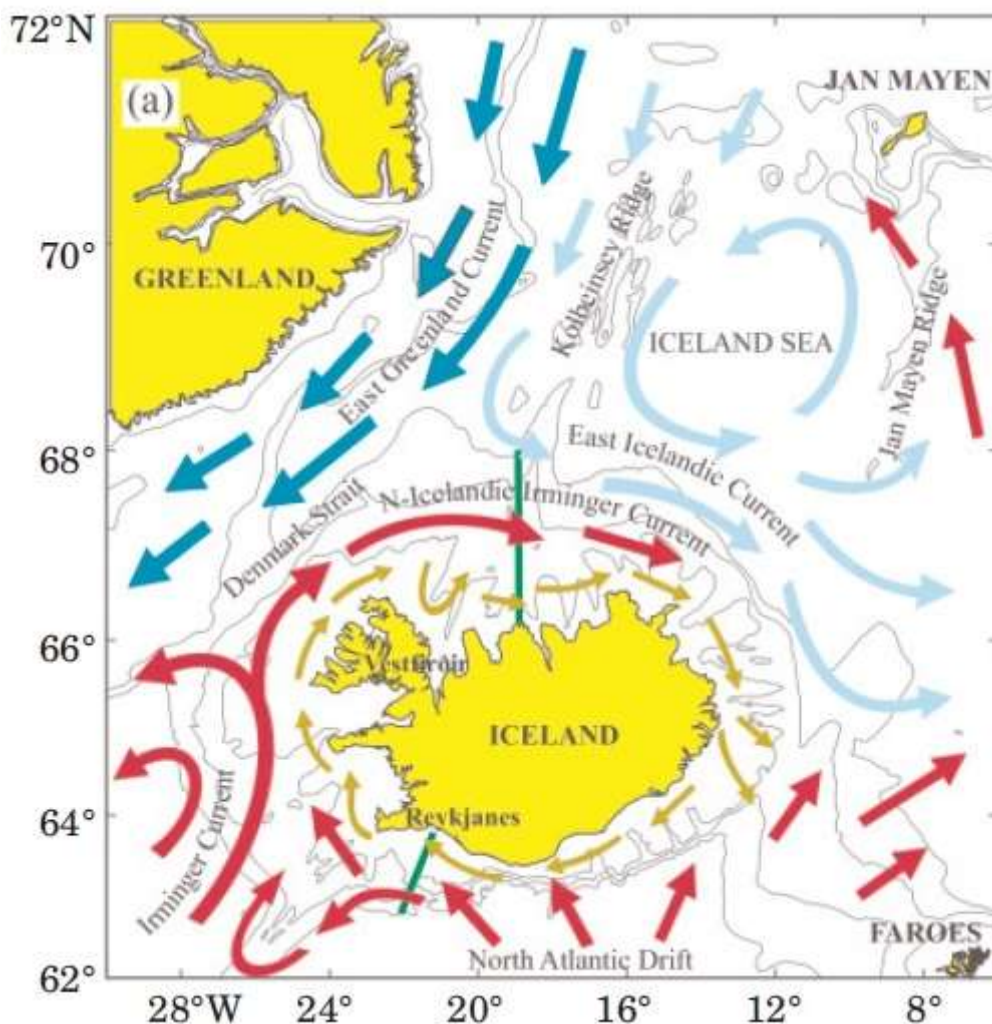


Figure 2: The East Icelandic Current splits from the East Greenland Current and passes through the Dreki area (Vilhjálmsson, 2002).

approximately 1000 to 1500 meters. Extractions at this depth are not common, but have also been proven possible in other contexts (SAGEX, AS, 2006).

Currents that move through this region serve the important function of blending colder, more saline waters moving out of the Arctic Ocean with the North Atlantic. The Dreki area sits in the center of the East Icelandic Current, which facilitates this blending and integrates the area with surrounding ecosystems. In addition to being at the intersection of blending masses of water, the Dreki area is situated just beyond the range of the more shallow North Icelandic-Irminger current which flows clockwise around the island (Rudels, Fahrback, Meincke, Budéus, & Ericksson, 2002).

### **3.4 Fish Stocks**

Being at the intersection of colder Arctic waters and the relatively warmer North Atlantic, the Jan Mayen Ridge is an unusually productive region for its latitude. Zooplankton production is high in the Dreki area, and gives rise to significant populations of forage fish which in turn feed populations of demersal and benthic species (Ministry of Industry, Energy and Tourism, 2007; Fossum, et al., 2012).

The most commercially significant of the stocks found in the Dreki area are capelin (*Mallotus villosus*), which spawn off the southern coast of Iceland and migrate to waters along the Jan Mayen ridge to feed on the abundant zooplankton found there. The distinct spawning stock that inhabits areas of the Iceland Sea is commercially exploited by Iceland, Greenland and Norway (Vilhjálmsón & Carscadden, 2002). Iceland's total average catch for 1963-2011 was 537,383 tonnes, with individual years varying widely from landings as low as 1,077 tonnes and as high as 1,319,191 tonnes (1963 and 1997, respectively) (Statistics Iceland, 2012). Variations of this kind are in part due to capelin's high susceptibility to environmental changes, as shifts in temperature and salinity have dramatic effects on populations of adult capelin (Vilhjálmsón, 2002).

The proliferation of pelagic fish in the region provides nutrients for stocks of higher-order species, including cod and Greenland halibut (Vilhjálmsón & Carscadden, 2002). These stocks have been observed throughout the Jan Mayan ridge in recent studies (Fossum, et al., 2012), but owing to its distance from known fishing grounds and the depth,

little information exist on their abundance in the Dreki area (Ministry of Industry, Energy and Tourism, 2007).

The presence of schools of capelin attracts migratory species as well; minke (*Balaenoptera acutrostrata*), humpback (*Megaptera novaeangliae*), and fin whales (*Balaenoptera physalus*) all migrate through the area (Vilhjálmsson, 2002; Sigurjónsson & Víkingsson, 1997). These species migrate through the region in the summer season, and depend on the concentrated schools of forage fish found in the region (Vilhjálmsson, 2002; Cecchetti, 2006). Numerous species of seabirds are likely to move through the area as well, also utilizing abundant stocks of forage fish.

### **3.5 Chapter Conclusion**

Despite there being a large body of data on the geology and oceanography of the region, existing literature has not fully articulated environmental baselines. The absence of current data on demersal fish renders decision making with regard to these species inferential, and an incomplete picture of how migratory species interact with the Dreki area makes understanding the risks they may face difficult. In the context of accelerating changes in climate that will alter the distribution and abundance of native species, data collected over a period of time are preferable to an isolated survey of conditions at present. The studies that have been conducted thus far indicate a real interest in obtaining the best possible environmental data before extractive activities proceed, but have not obtained a robust enough dataset to confidently describe the effects of such activities.

The potential ramifications for a spill in the region are serious, noting that weather conditions could make clean-up extremely hazardous. With commercial fisheries not currently using the area however, and with traditional or subsistence fisheries located at a significant remove from where drilling would take place, the threat to fish stocks is essentially only an ecological one. While that threat remains serious, it seems unlikely that human activities in adjacent communities would be significantly affected by accidents and spills in the Dreki area.

Understanding the incompleteness of the data on environmental effects in the area requires authorities and managers to exercise the precautionary principle in establishing and operating drilling projects in Iceland's waters. Here as elsewhere in the Arctic,

protecting human interests and rural communities will depend on managing for adaptive capacity, both with regard to the effects of climate change and shifting economies (Tompkins & Adger, 2004).

## **4 Geology and Commercial Potential**

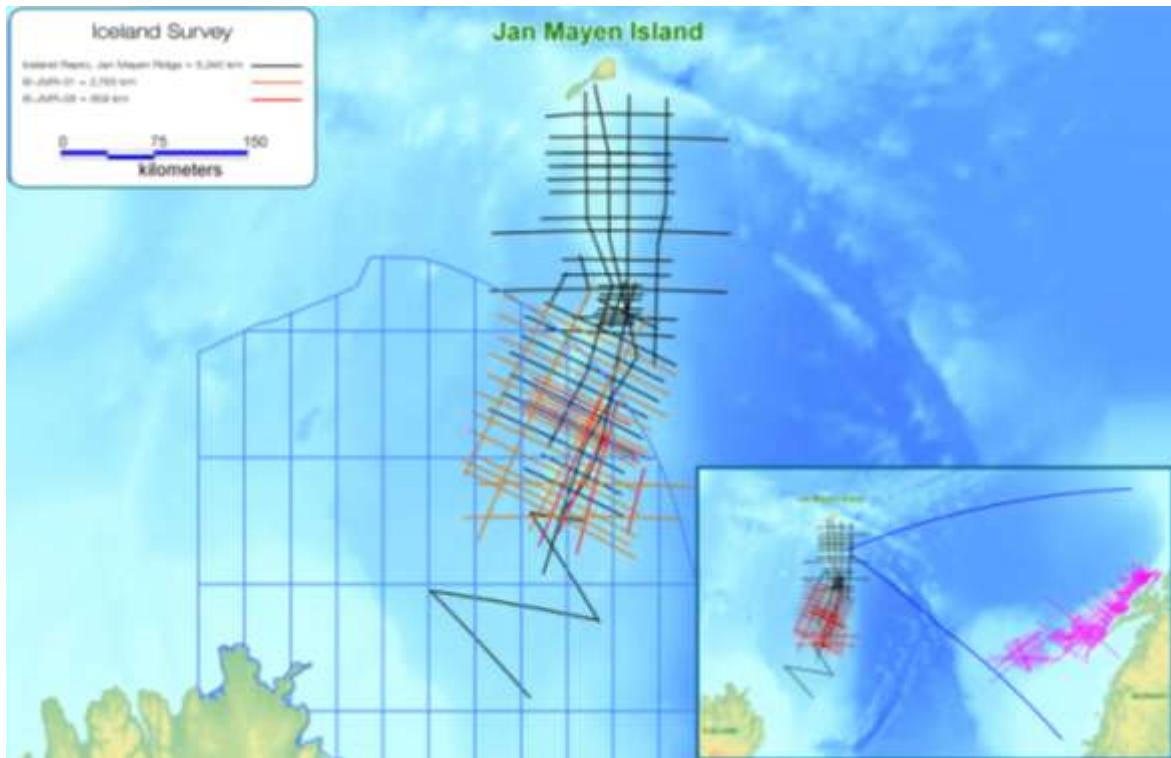
The geology of the Jan Mayen ridge has been extensively studied, and the Dreki area in particular has been surveyed extensively in recent decades. The seismic work that has been done and comparisons from geologically similar sites within the region suggest that there are commercially viable reservoirs in the area, but drilling has not yet begun. This chapter summarizes the current state of exploration and exploitation, the roles of the state and commercial parties, and the significance of domestic oil and gas production within the context of Icelandic energy consumption overall.

### **4.1 Geology and the Current State of Exploration**

In contrast to the incomplete picture of ecological baselines in the Dreki area, the region's geology has been extensively documented. From as early as 1975, studies from international teams have conducted single and multi-beam seismic surveys, describing the geology of the Jan Mayen Ridge (Sundvor, Gidskehaug, Myhre, & Eldholm, 1979; Sørnes & Navrestad, 1975). These surveys have varied in scope, but most have included what is now known as the Dreki area. Interest in the area has been international, with institutions from France, the United States, Russia, Germany and others joining Iceland and Norway in exploring the region's hydrocarbon potential (Gunnarsson, Sand, & Gudlaugsson, 1989).

More recent joint Icelandic Norwegian surveys in 1985 and 1988 have more comprehensively and specifically focused on the Jan Mayen Agreement area and the Icelandic remainder of the Dreki Area. These have been conducted with reference to the Jan Mayen Agreement, which stipulates that the burden of exploration be shared by the two states. Commercial surveys have been conducted as well, providing new datasets from both 2001 and 2008 (IS-JMR-01 and IS-JMR-08, respectively) and reprocessing of the earlier datasets as well (Oil & Gas Financial Journal, 2011). This work is ongoing, additional Norwegian studies are underway that are expected to be completed in 2013 (Carstens, 2011).



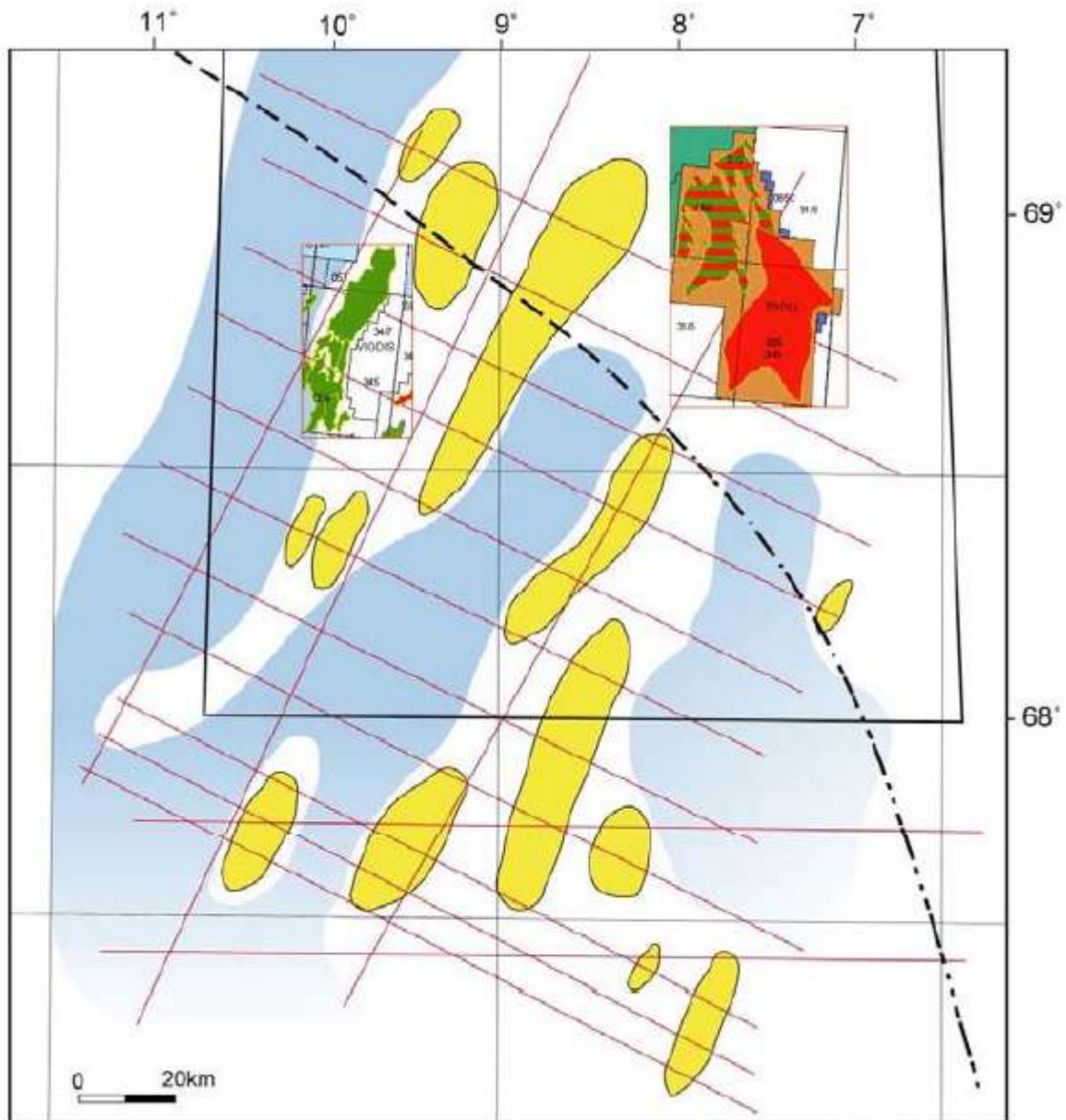


*Figure 3: Several seismic studies have been conducted on the areas now being licensed for exploration, visible here where blue grids indicate licensing blocks and intersecting paths indicate areas surveyed for their hydrocarbon potential (Spectrum, 2012).*

In addition to the seismic studies that have been conducted, one recent study analyzed satellite imagery for the region to investigate the possibility of natural seeps in the region (Jónsdóttir & Valdimarsson, 2009). The occasional presence of fishing vessels targeting herring in the region makes distinguishing natural and man-made oil slicks difficult. These difficulties are compounded by weather patterns that frequently obscure the region in the fall and winter off-seasons. The results of this study did not conclusively identify any natural seeps in the region, but do not preclude the possibility of there being reservoirs below the seabed. A more recent study of surface slicks has produced more promising results however, further supporting the premise that the adverse weather conditions have significantly affected the results of earlier studies (Fugro NPA, 2012)

## 4.2 Extent of the Resource

The consensus of seismic and other studies that have been conducted on the region suggests that there are commercially viable reserves in the area, and that it is possible these



*Figure 4: Geologically suggested probable reserves in the Dreki area are comparable to the Norwegian Snorre and Troll fields (highlighted in green and red respectively) (SAGEX, AS, 2006).*

are significant relative to comparable regions near the north of Norway and in the North Sea (SAGEX, AS, 2006). Further work has speculated on a varied set of scenarios in

which different actual discoveries are made, but from geological standpoint it seems likely that less conservative estimates will more closely approximate what actual discoveries will entail (Jónsdóttir & Valdimarsson, 2009).

That there is a strong economic incentive for pursuing extractive activities in the Dreki area is now more certain than even five years ago when a report by the Norwegian consultancy Sagem, AS report demonstrated positive net present values for any situation in which recoverable deposits are discovered (SAGEX, AS, 2006). In that report, then industry-standard estimates of twenty to thirty-five dollars per barrel were used, coupled with estimated exploration costs approaching \$130 million and a 12% discount rate were used to demonstrate that these reserves could be profitably exploited. Under the various scenarios considered at that time, at a per-barrel price of \$35, internal rates of return ranged from \$230-2800 million (SAGEX, AS, 2006). The report notes that other discount rates would alter those figures, but that 12% is what is most typically used in the industry.

The initial license offerings from the NEA met with limited interest from commercial parties, but in January 2013 the Authority granted two licenses for exploration and production (Orkustofnun, 2013).

### **4.3 Government and Non-Governmental Partners**

The governments of Iceland and Norway, license holders and other commercial users of the area all have significant commercial interests at stake in the area. Each of these parties stands to win or lose with petroleum activities continuing, but the risks they take on differ considerably. It is the stakeholders with the least to gain however, that face the gravest risks. The communities that depend on robust fish stocks and ecological integrity in the region would be the most immediately effected by pollution in the area, but have the least direct access to the profits gained from these extractions.

The Icelandic government stands to gain significant tax revenue from drilling in the Dreki area. In addition to an 18% corporate tax, per-barrel levies on produced hydrocarbons could represent a significant revenue stream for the national treasury. With the burden of investing in exploration and production costs remains the responsibility of licensees however, transferring a significant portion of the fiscal risk away from the government and onto those private commercial parties. Going even further, in the event of

an incident that resulted in significant environmental damage, the Hydrocarbons Act (13/2001) requires licensees to bear the cost of clean-up. It is unsurprising then, that the strongest interest in pushing ahead with production from the area has come from the Icelandic state. The early seismic work produced jointly by the NEA and the Norwegian Petroleum Directorate laid the groundwork for further commercial studies and generated early interest in the potential value of Dreki area reserves (Sundvor, Gidskehaug, Myhre, & Eldholm, 1979; Sørnes & Navrestad, 1975).

Norway's direct commercial involvement in the area is limited to 25% stake in licenses by the provisions in the Jan Mayen Agreement, but includes significant resources and experience in offshore drilling in comparable environmental conditions. Norway has extensive extractions of its own throughout the North and Norwegian Seas, which have generated significant income for the nation and been seen as an example to be followed by other Nordic states (Larsen, 2006).

The NEA does not publish information on license on applicants, but it does stipulate that in order to satisfy the requirement that an entity be registered in Iceland, it is sufficient to establish an office in Iceland. This allows for corporations from anywhere to stake a claim on the Dreki area and only be required to establish a branch office in Reykjavik. Licensees have by far the most to gain from petroleum production; even with the costs of exploration, Iceland's corporate tax and other fees, there are billions of dollars to be made.

The other commercial parties involved in the area, those who depend on the region's intact ecosystem, are the most threatened of the parties involved. These interests are primarily fishermen who targets stocks of herring and capelin in stocks near the Dreki area (Matthíasson, 2003). The area has not traditionally attracted a huge number of vessels; the fisheries that do utilize the area represent a small segment of Icelandic fisheries as a whole (Statistics Iceland, 2012).

## **4.4 Chapter Conclusion**

It remains important to consider what the role of new petroleum production would be within the broader context of energy consumption in Iceland. The nation is rightly known for being at the cutting edge of sustainable energy use, using significantly more

energy from geothermal and hydroelectric sources than all others combined.

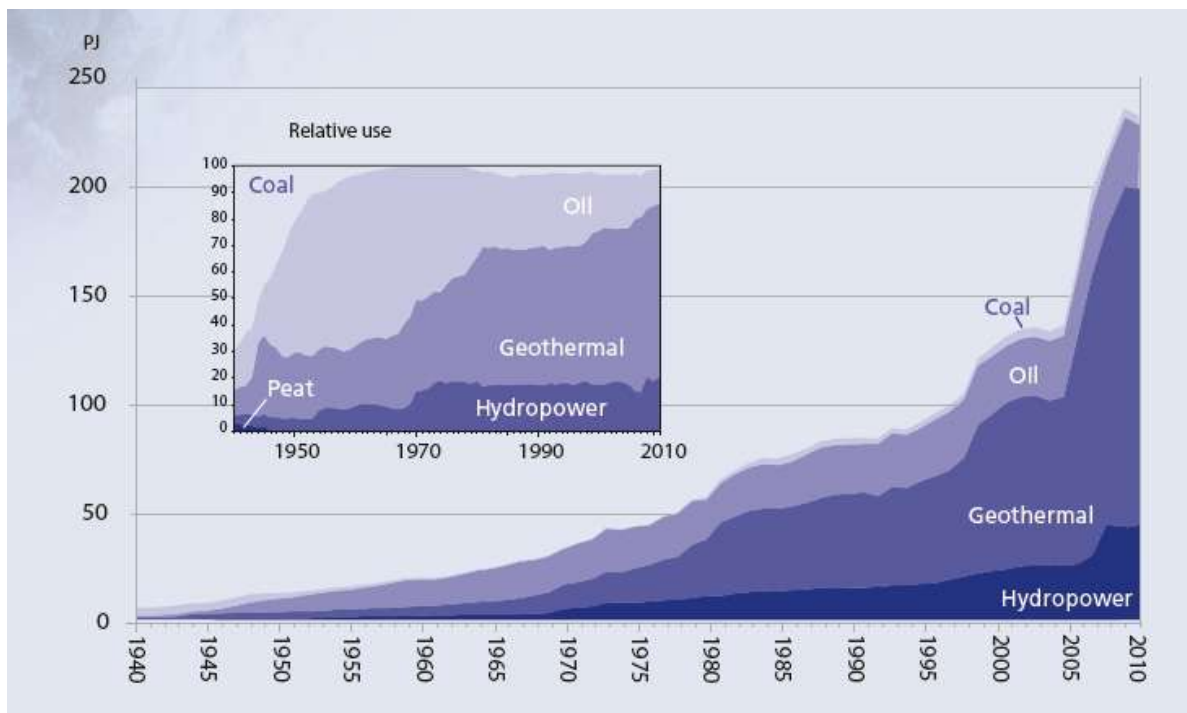


Figure 5: Primary Energy Use in Iceland 1940-2010 (Orkustofnun, 2011).

The petroleum products that would be produced in the Dreki area would be primarily for export. With the exception of the fleet, Icelandic consumption of fossil fuels is limited largely to non-commercial use, and is not likely to be significantly altered by the presence or absence of domestic energy production. The public good that the industry can provide is essentially a positive general impact on the national economy and a reduced dependence on foreign currency. That impact is not insignificant, but it is one that is substantially removed the communities bearing the ecological risk of drilling in the Jan Mayen Ridge.

## **5 Policy and Governance**

In contrast to the significant body of geologic data on the subsea conditions in the Dreki Area of the Jan Mayen ridge, little discussion has considered the policy and legislative framework surrounding this proposed project. In this chapter I provide an overview of the most significant domestic and international instruments of governance that guide offshore hydrocarbon extraction in Icelandic context. Their critique is done with the intention of shedding light on the effectiveness of existing policy on this and similar projects elsewhere in the Arctic, and considering the responsibility of new extractive activities.

### **5.1 International Governance**

The forms of international governance that cover proposed actions in the Dreki area as well as Iceland's petroleum activities in general range in scope from global treaties to narrow bilateral agreements. Though these instruments each are directed at a particular goal or aim of the parties concerned, collectively they represent the legislative framework within which any particular nation is free to design its own legislation. The United Nations treaties are theoretically more forceful than regional agreements and Arctic Council guidelines, but these softer institutions are more able to concentrate their expertise and knowledge on specifically Arctic issues; they are not as binding as international conventions, but their message is far more neatly tailored to their situation.

#### **5.1.1 United Nations Convention on the Law of the Sea**

The United Nations Convention on the Law of the Sea (UNCLOS), to which Iceland has been party to since its 1982 entry into force, lays the foundation for later instruments of governance on a global scale. Among many other definitions and provisions, the Convention defines 'pollution of the marine environment' at the outset, emphasizing the protection of marine and human life that could be damaged either directly or indirectly by maritime activities. These and other provisions require, in unspecific terms, that states protect the marine environment and consider conservation priorities in developing offshore resources both living and non-living.

The Convention also establishes a legal framework within which property rights over offshore resources are articulated, which paved the way for the development of those resources. Iceland's own conflicts with the United Kingdom over the extent of its jurisdiction over its North Atlantic fisheries—the 'Cod Wars' of the 1950s-1970s—further highlighted the need for an internationally agreed upon limit of territorial waters that would outline legal provisions for exploiting subsea resources in addition to those within the water column.

Under UNCLOS, each coastal state is permitted nearly total economic control over the resources occurring on its continental shelf. This offshore area, called the state's Exclusive Economic Zone (EEZ), normally extends a limit of 200 nautical miles from the coastline. It is of some significance for Iceland's situation, that article 76 adds that "...the continental shelf of a coastal State comprises the seabed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin" (UNCLOS art. 76(1)). This allows for, pending approval by the Commission on the Limits of the Continental Shelf (CLCS), an extension of a state's EEZ to 350 nautical miles from the coastline. Among the Arctic states, Iceland, Norway, and the Russian Federation have all made their cases that extended portions of the seafloor constitute 'natural prolongations' of their sovereign territory. To date, a total of sixty-one states have submitted claims to extend their EEZ beyond the base 200nm limit, eighteen of which have been accepted (CLCS, 2012). Both the exclusivity of a given state's EEZ and the limit of its jurisdiction are points on which the UNCLOS has been criticized.

Article 82 of the Convention requires that profits from resource extractions in the global commons be shared through the International Seabed Authority. "The coastal State," the Convention reads, "shall make payments or contributions in kind in respect of the exploitation of the non-living resources of the continental shelf beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured" (UNCLOS, art. 82.2).

In addition to being the first party to formally submit an extended claim under article 76 of the Convention (CLCS, 2012); the Russian Federation has also taken symbolic measures to assert its control over significant portions of the Arctic. In 2007 a pair of

Russian submarines successfully planted their flag on the seabed at the North Pole, seeking both to assert Russia's place as an Arctic power and to enhance the scientific basis of their CLCS bid (Chivers, 2007). While flag planting in itself has no legal impact on whether the Russian Federation's control over its claimed 'natural prolongation' to the North Pole, it indicates the increasingly contested space being formed by a potentially soon ice-free Arctic. Iceland has also submitted a claim to the CLCS over portions of seabed to the east and the southwest of the island, seeking to expand its EEZ into currently unclaimed waters in the North Atlantic (CLCS, 2012).

While UNCLOS provides groundwork through which property rights can be articulated, the convention faces challenges from powerful nation-states in the Arctic. The United States' has remained a major opponent of the treaty, and is one of the only states that have failed to ratify the Convention. US critics cite concerns over requirements for technology sharing, perceived threats to national sovereignty, and an overall increase in costs to the industry (Lerner, 2008). The effect of the US rejection of the convention and Russia's supplanting its legal claims with submarine theatrics is an erosion of the power of the treaty. The convention is a meaningful groundwork that incorporates conservation goals into its provisions, while being primarily focused on territorial claims and economic distribution.

With Iceland's proposed hydrocarbon extractions occurring within its base 200nm EEZ, the rent sharing provisions in article 82 of the convention do not restrict development. The articles requiring the precautionary approach, the conservation of migratory species and those restricting pollution of the marine environment do apply however. While these stipulations are unspecific and questionably enforceable, they provide a globally agreed-upon conceptual basis on which further international instruments and features own Iceland's domestic policy framework are based.

### **5.1.2 United Nations Convention on Biodiversity**

Where UNCLOS creates an initial legal framework within which foundational elements of the responsible use of marine resources are agreed upon, the United Nations Convention on Biodiversity (CBD) goes further by articulating that responsibility more fully. Adopted in 1992, the CBD legally defines a key set of terms and provides the



building blocks of the conceptual vocabulary necessary to create policy instruments adequate to the challenges of marine resource management.

The treaty asserts the ‘intrinsic’ value of biological diversity and of its component attributes, and it reinforces the gravity of aesthetic, economic, and other types of values. CBD expresses the value of ecosystem integrity for the sake of future generations, the intrinsic value of biodiversity and the value of traditional uses of marine resources, and these are presented as values that are worth the cost of following the precautionary principle. The convention thereby provides a basis in international law to challenge encroachments on those recognized values.

The treaty recognizes the deep connection between traditional ways of life and a robust ecosystem, and that equitably sharing the benefits afforded by the use of ecosystem services and the exploitation of resources is the desirable goal of effective management regimes. CBD defines ‘sustainable use’ in a way that encapsulates the notion of intergenerational equity.

...the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations. (CBD Art. 2)

Party states are required to identify and catalog activities that are likely to have significant impacts on the environment (CBD, art. 7), and article 14 requires states to mitigate potential adverse consequences through establishing assessment procedures, impact assessments and strategic environmental assessments.

### **5.1.3 United Nations Framework Convention on Climate Change**

The United Nations Framework Convention on Climate Change (UNFCCC) lays the groundwork for the broader system of international and domestic policy instruments as they apply to offshore drilling, specifically in the context of climate change. Adopted following the first Earth Summit in Rio in 1992, the Framework Convention establishes a global priority for reducing greenhouse gas emissions, sets targets toward achieving that end, and theoretically binds the parties to doing so. In itself it is a limited instrument that allows for the parties to contract together to set and reach lower emissions standards, but

subsequent iterations of UNFCCC—most notably the Kyoto Protocol and the Durban Plan for Enhanced Action (DPEA)—have set more tangible and more aggressive goals for atmospheric greenhouse gas reductions.

The treaty most significantly legally codifies the notion that the parties, according to the varying capacities of each, will work together to reduce greenhouse gas emissions. This is to be done in a way that does not challenge each party state’s sovereignty or ‘right to sustainable development’. Fundamental to the treaty’s principle of reasonable and cost-effective emissions reductions is the notion of acting on the precautionary principle. “Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures...” (UNFCCC, art. 3.1). This conceptual vocabulary underpins the process of mainstreaming that national parties are bound to undertake individually.

The Kyoto Protocol was a further commitment entered into by 192 of the 195 parties to the UNFCCC, which set specific emissions goals, and the subsequent DPEA not only continues the commitment of the Kyoto protocol seamlessly beyond 2012, but establishes the need for longer term, universal emissions targets to be decided on by 2020.

#### **5.1.4 International Convention for the Prevention of Pollution from Ships**

Adopted by the International Maritime Organization (IMO) in 1973 to combat marine pollution, the International Convention for the Prevention of Pollution of Ships (MARPOL), builds on and expands the provisions of the earlier 1954 convention on pollution by oil. MARPOL addresses a wide range of pollutants, and with its subsequent protocols added in 1973 and 1997 it regulates marine pollution from terrestrial sources as well. Iceland has been a member of the IMO since 1960, and is bound to the provisions of the MARPOL and other agreements facilitated by that body.

MARPOL provides detailed regulation on how pollutants are to be dealt with, both at sea and in coastal areas. The agreement aims to completely eliminate intentional pollution of the marine environment, and closely regulate conditions that might permit accident discharges of harmful substances. These provisions apply to most aspects of extractive activities that would take place in the Dreki area, including discharges from ships servicing drilling equipment, transportation infrastructure and onshore processing facilities.

## **5.2 Regional Governance**

### **5.2.1 The Convention for the Protection of the Marine Environment of the North-East Atlantic**

Formed to supersede the provisions of the earlier Paris and Oslo Commissions, the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) works to facilitate regional cooperation on marine conservation. Party states to the convention include Iceland and Norway, along with a number of other European nations and the EU. The agreement came into force in 1998, and while it does impinge on the jurisdiction of its contracting parties, OSPAR does work to ensure adherence to four principles aimed at ensuring the best possible governance for the marine environment.

These guidelines or principles represent a groundwork that couches specific issues in the context of good management practice, and collectively aim to ensure the ongoing integrity of the marine ecosystem, benefit to coastal communities and the sustainable use of marine resources. OSPAR aims to manage resources under the aegis of (1) the ecosystem approach, holding that the best outcomes for whole biotic communities are won by managing whole ecosystems as opposed to individual species or issue. Consequently, contracting parties agree to apply (2) the precautionary and (3) the polluter pays principles. These commitments require a further (4) obligation to apply best available techniques and best environmental practices. So while OSPAR is neither strictly binding nor prescriptive of specific requirements, it does add to the framework of what regional priorities Iceland has agreed to be bound to. The agreement adds to the conceptual vocabulary that frames an individual project like that of the Dreki area in the larger context of what constitutes good management of the marine environment more generally.

### **5.2.2 Copenhagen Agreement**

In addition to the more directly legislative instruments that are in place, Iceland is party to a regional multi-lateral agreement on controlling pollution and dealing with emergency situations. Drafted in 1971 and revised in 1993, the Copenhagen outlines programs for sharing information and resources that might aid in reducing oil-related pollution in cooperation with Denmark, Finland, Norway and Sweden (Copenhagen Agreement, 1993). This agreement is made in reference to article 194 of UNCLOS, which notes that “States shall take, individually *or jointly as appropriate*, all measures consistent

with this Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source” (UNCLOS, art 194.1).

This agreement does not put forth any substantial new policy directives or conceptual vocabulary, but it reinforces the party states’ commitment to having effective and collaborative programs in place to deal with pollution of the marine environment. Within the Copenhagen Agreement, technology sharing, resource collaboration and emergency response provisions work together to form a comprehensive network of protections that is designed to minimize the impact of pollution events at every scale.

### **5.2.3 Arctic Council: Protection of the Arctic Marine Environment Working Group ‘Guidelines’**

While not formally binding to the same degree that treaties like UNCLOS and UNFCCC are, the Arctic Offshore Oil and Gas Guidelines produced by the Arctic Council’s Working Group on the Protection of the Marine Environment (PAME) represent an important indicator of the shared commitments of the Arctic States. Although a full AC member, Iceland is bound to these guidelines only in so far as it seeks to cooperate with regional standards for petroleum policy. Produced in early 2009, the *Guidelines* present a comprehensive set of recommendations for how oil and gas developments in the Arctic should proceed. These proposals detail strategies for minimizing environmental impacts, mitigating adverse effects on traditional ways of life and emergency preparedness. What is particularly valuable in the PAME Guidelines is the holistic approach that they present. Where other international instruments focus more narrowly on conservation aims or defining the rights of sovereign states, these policy guidelines contain detailed recommendations across a broad spectrum of relevant issues.

The rights of indigenous peoples factor significantly into PAME’s work on Arctic hydrocarbon extraction. These are rights that are both political and cultural, with economic progress and the preservation of cultural forms being considered simultaneously. “In planning and executing offshore oil and gas operations, necessary measures should be taken, in consultation with neighboring indigenous communities, to recognize and accommodate the cultural heritage, values, practices, rights and resource use of indigenous residents” (PAME, 2009 p. 11). This echoes the types of language used in the larger-scale international agreements, but goes further by linking the notion of indigenous rights as

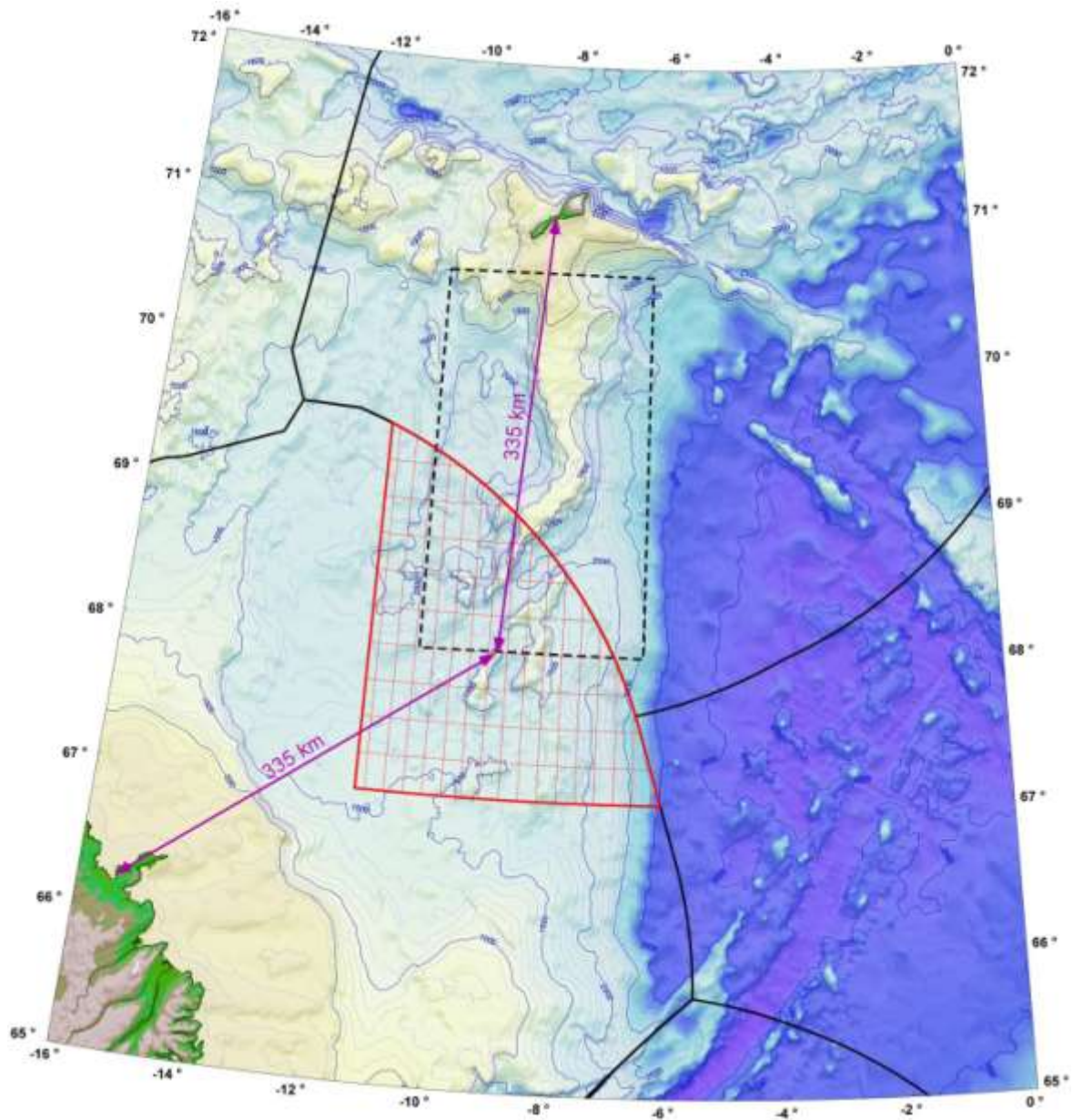
human rights with that of preserving cultural heritage and (elsewhere in the Guidelines) aesthetic values (PAME, 2009 p. 18).

Protection of marine ecosystems is also a significant thread running through these guidelines, with PAME suggestions going further than what is stipulated in other forms of governance. The guidelines cite the AC has having found that “...a significant threat from offshore oil and gas activities was the risk and potential impact of oil spills in an area of vulnerability to crucial habitats or threatened species” (PAME, 2009 p. 11). These calls for caution and consultation do come with an acknowledgement of the significant beneficial impacts that these developments may have. “Oil and gas activities may have pronounced positive effects on a nation’s employment and economy” (PAME, 2009 p. 9); it is noted as well however, that these positive effects are manifested differently at local and nation-wide scales. Where they do occur, adverse effects are typically most pronounced in the local communities near oil and gas activities whereas economic benefits are more widely dispersed (PAME, 2009 p.9).

These guidelines are too new have been mainstreamed into Icelandic law, and while not binding in a legal sense, they represent the collective effort of the Arctic States to create policy guidelines that institutionalize the highest aspirations of good governance. They address social, economic and cultural values, but do so in a way that acknowledges the real importance of each. The protections for indigenous peoples are not directly applicable to the Dreki Area, but Iceland’s recognition of those rights and the adverse effects that its development could have on distant populations is a vital part of maintaining notional integrity through its policy framework.

#### **5.2.4 Iceland-Norway Conciliation Commission (Jan Mayen Agreement)**

In addition to the global and regional agreements to which Iceland belongs, a bilateral agreement with Norway addresses resources on the Jan Mayen Ridge specifically. Jan Mayen is located approximately 290 nautical miles from Iceland, and—pursuant to article 121 of UNLCOS—is a legitimately island affording Norway the right to claim the sea surrounding it for its exclusive economic zone. As it is situating it too close to Iceland’s shore for both states to claim their full 200 miles of EEZ however, a commission hearing representatives from each nation was convened in 1981 to determine how the boundary should be set.



*Figure 6: Bathymetry of the Dreki Area (Orkustofnun, 2007). Distances from Iceland and Jan Mayen are indicated in purple. The red shaded area is the portion covered by the NEA's Strategic Environmental Assessment; the black dashed box indicates zone covered by the Jan Mayen agreement.*

The commission's recommendations award Iceland a full 200 nautical mile EEZ along the Jan Mayen Ridge, but create a special zone overlapping parts of both countries EEZs. Within the Icelandic portion of that zone, the Norwegian state is guaranteed a 25% interest in any ventures in the area; similarly, Iceland is given the opportunity to acquire 25% of any activities with the Norwegian portion of that zone.

## **5.3 Domestic Governance**

Aspects of Iceland's domestic system of governance echo the larger commitments of the international agreements to which the nation belongs, while emphasizing maximum production. The significant pieces of legislation concerning petroleum activities address the most important issues, but do not present significant detail with regard to environmental protections, nor equitable distribution of the economic benefits of these activities.

### **5.3.1 Act on Prospecting, Exploration and Production of Hydrocarbons 13/2001 (Amended 49/2007)**

The scope of this act covers the petroleum activities in the area extending out from 115m to the limit of Iceland's EEZ, and addresses the full temporal range of activities connected to the ultimate production of hydrocarbons, including initial prospecting, extraction, storage and treatment. It is the primary piece of legislation addressing offshore petroleum activities. The act addresses ownership of resources on the continental shelf, licensing regulations, environmental concerns through EIA and SEA requirements and addresses the responsibilities of commercial parties if unexpected environmental damages should occur.

Ownership of any concerned resources remains with the Icelandic state, except where a license has been given; in that case the licensee only obtains ownership of hydrocarbons produced by the licensee. Reserves that remain under the seabed, even those within deposits that are actively being exploited, continue to belong to the state. Article 4 of the Act, the Minister of industry remains the authority enforcing the provisions of this act (49/2007, art. 4). He may grant the National Energy Agency authority to grant licenses, and this is what has generally been the case in practice (Ministry of Industry, Energy and Tourism, 2007).

The specific contents, limitations, responsibilities and rights given in a particular situation are listed in the text of the license itself, with those contents being defined in article 11 of this act. Significantly, article 13 demands that any prospecting, exploration or production activity be conducted in accordance with 'good international practice for similar situations.' Entitled 'Duty of Caution,' it requires that an activity should not be

undertaken in such a way as to “needlessly hinder communication, fisheries or other activities” (49/2007, Art. 13).

Environmental protections as built into the text of this act echo aspects of what are called for by CBD and UNFCCC, but do so in a way that keeps economic interests in the foreground. The granting of licenses, it stipulates, “must take into account environmental measures, national economic interests and exploitation already started in the vicinity” (13/2001). These environmental considerations are not articulated in any greater detail here. Subsequent articles provide the National Energy Authority the power to withdraw licenses if a licensee cannot fulfill the fiscal and technical obligations listed in them, but it does not provide conditions for withdrawing a license for environmental reasons.

In the case of an oil spill or other form of unexpected pollution event, the licensee must pay damages to the Icelandic state. These include penalties for environmental damage, and the notes that this is the case even where it is not necessarily proven that the licensee was culpable. The gravity of this provision is limited however, where it is added that if damages are the result of a natural disaster the licensee is no longer liable. Catastrophic weather events, damage from icebergs or unusually extensive pack-ice are the sorts of occurrences that would be labeled natural disasters, but that are also not unlikely in a given season.

### **5.3.2 Regulation on Prospecting, Exploration, and the Production of Hydrocarbons 884/2011**

The regulation that implements the commitments articulated in the Hydrocarbons Act more thoroughly articulates what is required of licensees, and adds a layer of motivational checks that are absent from the earlier legislation. In the very beginning of article 18, the purposes of how license applications are evaluated hint at the question of ‘how to’ versus ‘whether to.’

The National Energy Authority may only base the conditions for the granting and use of exploration and production licenses with the necessity in mind to ensure that hydrocarbon activities within the licensed area are carried out in the best manner. (884/2011 art. 18)



The essence of this stipulation seems to be simply that where more than one party has applied for a given license area, the party most capable of conducting its exploration and production in accordance with *industry best practices* should be given preference.

That these practices are not necessarily *best management* practices, but rather those suited toward economic benefit and extraction is evident in the later clause regarding efficiency of extractions. Article 22 continues by noting that “The extraction of hydrocarbons shall be carried out in a manner providing the highest level of hydrocarbon production possible from each hydrocarbon reservoir” (884/2011 Art. 22). This point is reiterated elsewhere in nearly identical language; “The production conditions shall be attuned to attaining maximum extraction results” (884/2011 Art. 35).

### **5.3.3 Act on Taxation of Hydrocarbon Production 109/2011**

This taxation act covers corporate income from all hydrocarbon activities both directly and indirectly concerned with production. Its jurisdiction includes anywhere where Iceland is entitled to foreign hydrocarbon reserves, as is the case in the Dreki Area. The revenue generated under this act benefits the state treasury, dispersing the economic benefit of petroleum activities throughout the nation.

A per barrel levy price is determined by a committee of three individuals appointed by the Ministry of Industry, Energy, and Tourism. The price is determined each month at 5% of the value of the hydrocarbons produced, with the total value taken from current international rates. A part of this taxation revenue goes to fund a ‘Hydrocarbon Research Fund,’ funding research to “...strengthen the development of research and scientific knowledge of hydrocarbon resources on Iceland’s continental shelf” (39/2009).

### **5.3.4 Environmental Impact Assessment Act (106/2000 as Amended 74/2005)**

The Icelandic acts on Environmental Impact Assessment (106/2000 Amended 74/2005) and Strategic Environmental Assessment (105/2006) regulate those assessments that must be done on any project. The act lists two sets of activities that either *must* undergo an EIA (Annex 1), or *may* require an EIA (Annex 2). Under that rubric, annex 1 includes “Extraction of more than 500 tonnes/day of petroleum and more than 500,000 m<sup>3</sup>/day of natural gas” (106/2000), which will almost certainly include Dreki area

extractions. The EIA act mentions the necessity of involving stakeholders, and does so in way that suggests the importance of integrating stakeholder perspectives with ecological data. In addition to the required collection of data environmental, the act mandates periods of public consultation in which anyone may comment on the proposed activity.

### **5.3.5 Nature Conservation Act 44/1999**

The Nature Conservation Act does not specifically target petroleum activities, but it does establish national policy on protecting the environment. The act's objectives encourage protection and preservation of the environment, both terrestrial and marine; "The purpose of this Act is to direct the interaction of man with his environment so that it harm neither the biosphere nor the geosphere, nor pollute the air, sea or water" (44/1999 Art. 1). The scope of the powers extends to the limit of Iceland's EEZ, although mineral extractions from at least 60 fathoms are under the jurisdiction of the Act on Icelandic National Ownership of Seabed Resources No. 73/1990.

The act grants the Minister of the Environment the power designate national parks, nature reserves and conservation areas, which can be sites at sea as well. Where a site is deemed to be important from a "...scientific, natural, historic or other cultural perspective" (44/1999 Art. 54), it may be subject restrictions designed by the Nature Conservation Agency. These restrictions exist to varying degrees, according to the reasons for designating a site initially.

## **5.4 Chapter Conclusion**

While Iceland belongs to other international conventions and there are other pieces of legislation concerning protections for the marine environment, those described here are the most directly pertinent to the Dreki area. Collectively, they form the background system of governance under which specific developments can be pursued, and sets the priorities for what is then required in specific instances. Though in itself the policy framework provides little insight into the consequences of not-yet-realized extractive processes, it does provide a reference point against which to compare similar situations elsewhere in the region where production has already begun.

Under this regime of governance, the members of the coastal communities adjoining the area have little power over whether the project would continue. The ownership of

resources themselves remains with the state, and the decisions concerning how licenses are conducted at the ministerial level. The investments in infrastructure that would facilitate vessels and equipment getting to offshore reservoirs would serve to benefit those communities, yet tax revenue of Dreki area oil bypasses the municipalities. Whether the opinions of the residents of these rural communities have been adequately considered and whether the current legislative system affords them a meaningful role in decision making remain important questions as commercial parties move forward with plans to begin production.

## **6 Attitudes and Perspectives: Results from Stakeholder Interviews**

The themes that repeatedly surface with regard to the Dreki area touch a contentious sort of dialogue among eastern municipalities, a sometimes adversarial relationship between environmentalists and rural citizenry; there are thoughtful perspectives on each side of the basic question, ‘would drilling this oil benefit the average Icelander.’ Perspectives differ on the effectiveness of the ministries involved, the degree of environmental risk being taken on, and the impact of media—respondents felt that hypothetical industry programs have no reason to be the subject of national discourse on one end, to those who argue that Iceland’s energy future is one of the central questions facing the nation today. This chapter begins with a stakeholder analysis, intended to frame the discussions in a context larger than the interviewees themselves. Next, threads picked up by interviewees are described and compared. The statements discussed here do not comprise a comprehensive catalog of the topics raised, but capture the breadth and dynamism of this conversation. They are broadly divided into three conceptual areas; social concerns, governance and cooperation, and the management of dissenting opinions.

### **6.1 Stakeholder Analysis**

Identifying stakeholders in the area presents a number of complexities; production is not underway to date, rendering it difficult to concretely define the affected individuals or groups. Stakeholders were identified by considering both who has expressed the most significant interest or motive to pursue oil production, while also considering who would be impacted by it. Attempting to encapsulate both motives and effects, interviewees were selected based both on their role in the Dreki area and for their knowledge of environmental policy and attitudes in Iceland as a whole. The scope of this project did not allow for multiple representatives from every stakeholder group to be interviewed, but the identity and key interests of stakeholders as expressed by those who were interviewed are described in Table 2.

Table 2: Stakeholder Analysis (adapted from (DFID, 2002))

| Stakeholder Status:   | Interests related to exploration in the Dreki Area:   |
|---|---|
| <i>Key:</i><br><br>License Holders<br><br>NEA   | <ul style="list-style-type: none"> <li>• Profitable production of oil and/or gas if found in significant quantities</li> <li>• Responsible use of national resources</li> <li>• Ensuring exploration, production, and processing are done in compliance with regulations</li> <li>• Increased tax revenue for national treasury</li> </ul>                    |
| <i>Primary:</i><br><br>Local Municipalities<br><br>Industry Workers                                       | <ul style="list-style-type: none"> <li>• Increased tax revenues and economic diversification</li> <li>• Equitable distribution of resource rents, at present and for future generations</li> <li>• Safe and secure long-term employment opportunities</li> </ul>  |
| <i>Secondary:</i><br><br>Fishermen<br><br>Environmentalists<br><br>Rural economies (secondary industries) | <ul style="list-style-type: none"> <li>• Continued viability of fish stocks</li> <li>• Preservation of the marine environment</li> <li>• Prioritization of renewable energies over non-renewable</li> <li>• Capitalizing on increased wealth in small communities</li> <li>• Contributing to a diverse economy where oil services will be located.</li> </ul> |

## 6.2 Social Concerns

### 6.2.1 The entire country will benefit from this project.

One of the assertions in this dispute is over who stands to benefit, or who stands to benefit *most* from oil production in the Dreki area. On the conservationist side, respondents have argued that the only significant beneficiaries will be the companies producing in the region and that the local communities will not reap substantial benefits. On the other hand, speaking as a member of the industry, Respondent A is unequivocal in his belief that this is a project that will benefit every Icelander. He argued that “...every community will be the beneficiary of this, both in terms of opportunities and as taxes for

the whole country.” The Act on Taxation of Hydrocarbon Production (109/2011) does establish a levy system that would benefit the national treasury and through that fund government programs.

In the early stages of prospecting or exploration, the national-scale economic benefits are unlikely. Services related to the exploration phase, Respondent F pointed out, “would not be a game changer for any area at this stage.” They would be a “nice addition,” he continues, but was careful to note that the impacts of exploration and full-scale production will be vastly different. Much depends on the extent of the resource to potentially be extracted, and if there are no economically viable reserves to be accessed the effects of prospecting will be minimal and not significantly alter the future of any area in particular.

Taking a balanced perspective that draws from each extreme presents its own challenges. Were the project to cause a significant influx of money and new labor into the region, existing social structures are threatened. This is the cautious stance taken by one respondent:

It is likely that if everything is done properly and nothing happens, the benefits could go to the communities that would be involved and the region that would be involved in the form of economic benefits, improved infrastructure and services. At the same time I think there is a lot of issues that have a negative side as well. It is common in megaprojects all over the world—I assume, but also in the Arctic—that sometimes the benefits that people expect tend not to be as much as they expect. (Respondent C)

As the existing framework for the assessment of projects like this one does include provisions that involve stakeholders, there is good reason to believe that economic benefits would reach the residents of small coastal communities. Gylfason (2001) argues however, that the trend among resource rich nations is one of slower economic growth, and that those states that have managed to invest in education and infrastructure have usually done so by creating or maintaining significant economic diversity (p. 848). In order to see long term improvements in per-capita income distributed equitably throughout the population, resource rents must be managed in way that promotes sustainable and diverse economic futures. The overwhelming majority of respondents pointed to Norway as an example of

resource extraction done in a socially responsible way, and saw the cooperation between Iceland and Norway on the Dreki area as ensuring that the same will be true for Iceland.

### **6.2.2 Conflict between existing fisheries and a new oil industry**

Fisheries in Iceland are both a significant industry and a vital piece of national identity. Their preservation is at once a practical and cultural project, but is one that is not likely to be threatened by the development of a new oil industry functioning properly. Potential conflicts include one between preservation of tradition and industrial progress, damage to stocks from a drilling accident, and a clash between the preservation of a resource for future generations and immediate utilization.

Several respondents highlighted a theme of conflict between traditional values that go hand-in-hand with traditional uses of marine resources and economic priorities that are served by the petroleum developments is one that surfaces repeatedly in regards to the Dreki area. Respondents in the northeast however, did not raise this as a significant issue. Respondent E pointed out that officials in Vopnafjörður have been interested in pursuing whatever oil deposits may be available for “a very long time.”

If exploration and eventual production proceed without major incidents involving pollution of the marine environment, Respondent G argued that there is direct impact on the fisheries. While herring and capelin are occasionally harvested in the Dreki area, they are highly migratory stocks that are targeted across a large area around the coast of Iceland. Were there demersal stocks in the area they may be more threatened, but as Respondent G added, “there are no resident stocks there that are being fished; the only fisheries there are the highly migratory species.”

In contrast, a spill could have serious ramifications for an individual species or fish stock. “I also think that were something to happen—and now I’m specifically talking about some sort of accident or an oil spill—it would obviously be quite disastrous for these communities” (Respondent C). Speaking from a biologist’s perspective, Respondent G agreed that a spill “probably would stay for a very long time, and would drift to Iceland or Norway, these areas and cause damage.” The potential for expert seamanship to be translated from the fishing industry to petroleum is an opportunity that could become compulsory if stocks disappear and the only remaining viable economic path is through that adaptation. Yet the modern face of fishing in Iceland requires oil and the infrastructure that it enables in order to profitably export its products.

Whether oil extraction would serve short-term economic goals at the expense of lasting preservation of the marine environment. In another's words "...you shouldn't sacrifice a thousand years of history and landscape for a short term development that doesn't pay off for anyone" (Respondent D), modernization of Iceland and its other industries requires a degree of change that renders complete preservation an unlikely and potentially undesirable course of action. Traditional uses are already in transition, but the concern with appropriately balancing use and conservation remains an urgent point.

One topic on which most respondents agreed upon was the ready transferability of skilled seamen from fishing to the industry. "I think the communities with expertise of seamanship, of fisheries can easily translate their expertise into oil and gas related opportunities," argues respondent A, referencing the huge success that this type of transition has had for the Faroe Islands. The opportunity to transfer skills to a new industry is a notion that may take place with or without any actual discoveries being made, and according to Respondent C, may serve to provide an avenue through which Iceland's maritime heritage can be constructively adapted to meet modern demands. With the likelihood of a direct conflict between pelagic fisheries and oil exploration being considered low however, the need for transitioning workers from one industry to another appears distant.

### **6.2.3 Iceland's clean energy future**

On the whole, Icelanders see their nation as being or having the opportunity to be exemplary in their use of clean and renewable energy. The island leads the world in utilizing geothermal power, and the pristine areas of its environment are a source of significant national pride. Not all however, are in agreement with the notion that Iceland's desire to produce clean energy and lead the world in sustainable development mandates not being a producer of any oil or gas. Because there is a strong and stable framework in place to regulate the industry, and because Norway provides a neighboring example of environmental safeguards. An individual within the industry argued that in Iceland "the risks are minimal in relation to other countries. In my mind it is only a good thing that we would do it the Norwegian way, so to speak" (Respondent A)<sup>1</sup>.

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<sup>1</sup> The Norwegian way—as articulated by Norwegian Foreign Minister Espen Barth Eide—prioritizes clear oversight but acknowledging the inevitability of tapping the Arctic's



Some of those surveyed commented to the effect that developing an oil industry in Iceland is contrary to the course the nation has been on. “Iceland prides itself on being a country with clean energy, and this is in strong conflict with that notion,” argues Respondent B. Moving into hydrocarbon production represents a “step back for Iceland” (Respondent C).

We’re in a position to be quite aggressive in trying to move further towards alternative energy options...as far as I’m concerned, extraction of oil, any kind of services to oil industry, anything about the oil industry, it can never be sustainable because oil is not a sustainable source of energy. (Respondent C)

A majority of those interviewed however, saw the Dreki area oil as a good opportunity that will benefit the country in the long run. While acknowledging that the risks and rewards are not yet fully articulated, Respondent E argued: “I think there is a great demand that if there is oil, it will be exploited and it will benefit the whole country.” He went on to note that this is the overwhelming consensus particularly among northeastern Icelanders, but that in the nation as a whole the consensus would agree that any steps that can be taken to improve the economy should be taken.

Several respondents suggested that this consensus may have been different prior to the banking collapse in 2008. “Maybe in the year two thousand seven and before, it would have been a more popular opinion not to drill,” argues Respondent F, “Simply because the largest urban areas, Reykjavik and the surrounding areas; people there would have been seeing the economy blooming.” These days however, the opinion that it is better to leave the oil untapped is being voiced by environmentalists and academics but in a limited context, and has not been substantially discussed in the media. “It’s a very isolated view that we should not drill for oil in the North, because of the risks or obligations toward reducing global warming and such. That’s not very popular” (Respondent F).

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resources; The exploitation of Arctic resources will happen. It has always been our key policy to make sure that the rules are clear, both on who owns what and on how to exploit resources. The Arctic is not special in legal terms; it is just an ocean. The area is of course ecologically vulnerable. But it is possible to have responsible drilling. (Eide, 2012)

## **6.3 Governance and Municipal Cooperation**

### **6.3.1 Competition among governments**

Competition between governments takes on two distinct dimensions. The first is a relatively new contest between municipalities in the northeast to determine where services supporting Dreki area oil will be located. The second is an established quarrel between rural communities and detached regulators in Reykjavik.

Municipalities throughout the northeast have been engaged in a contest to see where the new oil industry will be based. In the long term the benefits of production are seen as likely to have a positive impact on the country as a whole, and within the region to disperse more widely than just wherever companies choose to base themselves. More immediately—and if the Dreki area does not ultimately enter the production phase—there will be winners and losers.

With a disproportionately large percentage of Iceland's population concentrated in the capital region, there is an ongoing tension between the authority of the national government and local governments. This tension takes on a variety of dimensions and is particularly divisive around fisheries management and megaprojects (Jóhannesson, Robaey, & de Roo, 2011; Auth, 2012).

At least for the local politicians and even some of the MPs it is a question of pitting the northeast communities against those in Reykjavik who sit in coffee houses and drink café lattes. There is a conflict there and I believe that in Iceland at least there is a tradition of pitting the countryside against the metropolitan. (Respondent B)

For the Dreki area, the potential disagreement is over whether environmental groups or even ministries in Reykjavik should be able to dictate whether or not these coastal communities can access the perceived economic opportunities that resources represent. Knowing that this disconnect exists inspires in some the opinion that opposition from coastal communities is as much about finding something to fight over as it is real environmental concern; "Some people are against it, they want to preserve everything everywhere, don't want to have roads, so these kinds of people are against it. I respect that but I don't understand it" (Respondent A).

### **6.3.2 The Openness and Effectiveness of Governance**

A perceived lack of effective communication between the different ministers, industry partners and local residents compounds the difficulties created by a distrust of centralized decision making in the capital. “I have always observed in Iceland that communication between industry and politics and even between ministries like—ministry of industry, ministry of environment—that they don’t really like talking a lot with each other, and usually when they do it ends in a conflict” (Respondent D). The process of implementing the statutory consultation required between the ministries of environment and industry, as well as consultation of the public throughout the process of environmental impact assessment has not proven open and effective.

## **6.4 Managing Dissenting Opinions**

Finding effective mechanisms for integrating the input of dissenting opinions into the design of a project’s management is at once one of the most difficult aspects and the greatest opportunity for stakeholders to affect best outcomes for themselves and the ecosystem. Drilling has not yet begun in the Dreki area, neither for exploration nor production, affording stakeholders from all sides a unique opportunity to synthesize compete interests in as harmonious a way possible.

### **6.4.1 “The Risks are minimal as compared to other comparable projects,” and “there are always a few who oppose any project.”**

A common contention is that in Iceland, as opposed to developing states elsewhere in the world, the policy and governance structures exist to do this type of development in safe and holistically effective way. While this is true to the extent that Iceland borrows much from Norway’s effective policies, the unique challenges presented by the Arctic ensures each new development presents its own set of threats and opportunities. It is possible to safely govern the Dreki area for the best possible mitigation of environmental impacts, but there remain issues to be addressed in doing so.

A recent report published by Lloyd’s and Chatham House catalogs the ongoing and fluid risks that threaten investments in the Arctic (Emmerson & Lahn, 2012), and serves to confirm the position of one respondent in regards to the overall state of Arctic policy:

All Arctic states are aware that there is so much missing in the area for this to be a very good idea at the moment. In their policy papers, they all state two things,

among others of course; one is that they want to ensure sustainable development and protection of the environment in the Arctic, which is very fragile. Two though, they also intend to do whatever they can to get the resources that are available there and to use the shipping lanes as soon as it becomes possible, which is probably going to happen sooner than people think. There is a really big contradiction there.  
(Respondent C)

Finally, there are a number of parties who make the case that opposition to oil exploration does not indicate genuine concern for ecosystem integrity, but that there are simply always a segment of the population ready to oppose whatever project is suggested. Here as is the case elsewhere, there is a balance to be struck between dismissive handling of real concerns and limiting the degree to which consensus can be hindered by outlying issues.

## 7 Discussion

The summary picture of the Dreki area and what it means for its diverse set of stakeholders is one of uncertainty and opportunity. Uncertainties concerning aspects of the project abound, not the least of which is whether there is in fact a significant quantity of oil or gas to be extracted. The potential impacts of a spill, several respondents agreed, are not well-known. But whether the project continues to production or ends after exploration, it will be an economic boost to the region. If the most optimistic projections of how profitable the area may be are true, the long-term impacts on the Icelandic economy may be much more significant. Several remaining points that have not been previously addressed in chapter conclusions are discussed here.

### 7.1 Environmental Concerns

This project's review of the environmental conditions in the Dreki area, including the region's geology and use for fishing finds that there are some areas of data that are not fully articulated, but the fishing industry is not acutely threatened by production in the Dreki area. The species that are commonly observed in the area are highly migratory, and the Dreki area makes up a small portion of their total range. Fisheries are not concentrated in the area, although some portion of Iceland's capelin catch does take place there. There is a potential for currents to broaden the negative impact of an oil spill, but under normal conditions the area is not more sensitive than comparable regions elsewhere in the Arctic.

Yet the opinion of several interviewees that there has not yet been significant debate on the environmental risks and merits of the project suggests that what questioning has occurred has been first about 'how to,' with the question of 'whether to' trailing behind. While it has been asked *whether* the oil should be extracted (Elísson, 2012), the vast majority of information made available in the media and by the NEA have emphasized answers to *how* the oil may be tapped. This is an area in which future debate may yield helpful dialogue regarding the long-term priorities of the nation vis-à-vis hydrocarbon production in an era of accelerating climate change.

Assessing the completeness of the legislative and policy framework surrounding the area addresses not only the immediately tangible environmental, health and safety concerns, but also the economic impacts at present and into the future. The tax structure

that is currently in place fails to consider intergenerational equity, and the wisdom of extracting a non-renewable resource at one time over all others. Recalling Hotelling's rule, it bears consideration that the significant cost of Arctic petroleum developments may not justify their immediate actualization. This is particularly true in the Icelandic context where resource extraction is not being considered a vehicle through which indigenous communities may be empowered, nor a situation in which there are absolutely no other economic opportunities for residents of rural communities.

## **7.2 Opinions of Stakeholders**

Throughout the interviews conducted, respondents continually expressed a sense of inevitability. With the national economy being seen as in need of new enterprises, the desire of most Icelanders to regain their affluence from prior to the banking collapse, and the frequently-cited example of Norway's oil wealth, both proponents and protestors agree that exploration in the Dreki area has long been inevitable. Municipalities closest to the area have been intrigued at the possibility of oil wealth for many years already; and as several respondents noted, any industry that holds the promise of job creation in the short or long term is appealing.

While the opinions of those surveyed were split on the net benefit of Dreki area oil, their comments indicated that those in opposition to any kind of extraction are the clear minority. This was the case both for urban and rural Icelanders, with those in the northeast seeming to more consistently support the projected development. Those opposed to drilling most prominently cited inadequate knowledge of environmental baselines in the area, and the long-term climate change related implications of fossil fuel extraction and consumption. To a lesser extent, inadequate emergency preparedness was also cited as a concern. Key points that were raised in favor of the project include most significantly a potentially large boon to the national economy, benefits in the form of jobs and secondary industries in some of the towns of the northeast, and to a small degree the independence from foreign imports that the project might impart to Iceland.

Several of those surveyed argued that not enough is known about the environment in the Dreki area, and specifically that whatever impacts a major spill would have are not readily known. Studies in the area have revealed that benthic life is comparable to other regions with similar conditions (Fossum, et al., 2012). The location and abundance of the

capelin and herring catch in the area are well known, and are not seen as significantly threatened by Dreki oil. The species that are known to sometimes exist in the area are highly migratory, and have large ranges of which the Dreki area is one small part. The extent to which a spill would drift, or spread would depend significantly on the type and extent of that spill, but information on these effects has not been made available.

The capacity of emergency services needs to be vastly expanded in the event of exploration progressing into production<sup>2</sup>. Collaborative work with Norwegian partners through the Jan Mayen agreement as well with other states through the regional agreement on pollution response, and the Arctic Council should all contribute toward a more comprehensive pollution preparedness regime if production occurs.

## **7.3 Future Research**

Comparative studies that examine the social impacts of oil and gas development in coastal areas—especially those developments that have been underway for significant periods of time—represent an area in which further research may provide greater insight into what the likely social effects of Dreki area oil will be. Norway's success with offshore oil and gas was cited often as a model that Iceland should seek to follow. Comparing the social changes in rural communities and the nation as a whole throughout the development of their oil industry may provide insights into what Iceland may expect.

A detailed study of the likely impacts of a spill and mitigation measures that may limit environmental damage from such an event would allay the concerns of many who are resistant to production in the Dreki area. The failure to prioritize sustainable development over non-renewable resource extraction will continue to be an issue for some. Having a clear understanding of what is risked environmentally and an effective plan to minimize that risk however, would improve the project's perception for some of those who oppose it.

## **7.4 Conclusions**

This study has sought to clarify and catalog the diverse set of environmental, social and economic opportunities and risks presented by Iceland's new oil industry. The environmental risks presented by a challenging environment in the Arctic present unique

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<sup>2</sup> This is primarily the opinion of respondents D and F, but as also expressed in (SAGEX, AS, 2006).

technical challenges in a sensitive area where recovery times are long and baseline data are incomplete. Commercially significant fisheries are not concentrated in the area however, and much of the marine life that appears in the area migrates across a wide area. The social impacts are still being determined at this early stage, but some conflict has already been documented among individual opinions and between municipalities. The public benefit following increased tax revenue and decreased unemployment are highlighted as the most significant social opportunities, with fiscal inequities and a loss of traditional values and place attachments as the chief social risks. The economic opportunities are highly dependent on the amount and type of hydrocarbons that are found, but are seen as being of national significance by everyone interviewed for this study. Potentially false hope in what may still not become a major Icelandic oil industry stands opposite a newly energized economy.

This study also set out to determine the most significant opinions in favor of and opposed to the Dreki area's development. Chapter six expanded on three major themes in social benefits, governance and the management of disagreement. While all respondents agreed that the fiscal benefits touted by industry representatives *would* reach the Icelandic public, inequities were suggested with respect to the concentration of environmental risk in the Northeast. Existing fisheries are not immediately threatened by the development, but a number of interview respondents suggested that an oil industry is in conflict with Iceland's national prioritization of renewable energies. Economic benefits are pitted against environmental and social priorities by the project's opponents, while increased opportunity and widely dispersed revenues are suggested by its proponents. Respondents suggested that public perception of environmentalists has improved in recent years, but that with regard to the Dreki area, little substantial debate—including public discussion of both costs *and* benefits and deciding 'whether to' before 'how to'—has taken place thus far.

A great deal hangs on whether the initial exploratory wells expected in the near future confirm or deny the vastness of this resource. The policy and research is in place to see Iceland become as responsible an oil nation as any. The gaps and loopholes also exist to see the potential for genuine winners and losers to emerge from a bold new oil adventure. The majority of Icelanders agree with seeing how far the Dreki area can take them, and while a few dissenters have voiced thoughtful concerns, the process is well underway to see the resource tapped. Remote environmental concerns have had a



diminishing currency in the Dreki area debate, overshadowed by present and felt need for new income into the economy. Even as an oil producing state, Iceland will continue to be a major producer of renewable energy but a pragmatic user of a singularly diverse portfolio of natural resources.

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