SEA effectiveness and power in decision-making

A case study of aluminium production in Greenland

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SEA effectiveness and power in decision making – a case study of aluminium production in Greenland

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Foreword

This thesis addresses the need to place Greenland on the "political grid" in a way that would help ensure that Greenland's natural resources are utilised sustainably and that a proper distance is maintained between Greenland's government and any current or prospective business partners on the international scene.

Greenland is located halfway between the Nordic countries to the east and Canada and Alaska to the west. Nobody in Greenland would ever think of denigrating the basic principles of good governance characteristic of Nordic and North American democracies. We must admit, however, that when it comes to everyday practice, we do not always honour those principles. In some ways, we still live – not formally, but in actual practice – in the shadow of authoritarian colonial times, which are only a quarter century away. At the grassroots level, political evolution takes its time.

Referring to the shadow of colonial times may seem provocative, but the fact is that part of Greenland's existing governmental structure was taken over directly from the "Ministry for Greenland" put in place by Copenhagen. Devolution took place as late as 1987.

Western democracy is grounded in freedom of speech and in division of powers, as we all know. However, right to the present day, Greenland struggles with both. In contrast to the situation in Nordic and North American countries, radio and television media in Greenland, for example, are still politically controlled by the government in Nuuk and would never try to pose a serious challenge to that government. (Modern democratic principles are here represented by the printed press, the wage and employment policies of which need no seal of approval from the government.)

Decolonisation cannot take place from one moment to the next. Not only does it require changes in a number of official procedures, it demands above all a different approach to the very concept of authority. That kind of turnover of attitudes entails a change in mentality and engrained reaction patterns, a change in the way you bring up your children and relate to youth, and especially some serious reflection on the question of reciprocity between you and your superiors or subordinates. Decolonisation takes place in challenging stages.

The mineral regime in Greenland provides an example of the challenges around the decolonisation process. The mineral regime is administered by the Directorate for Raw Materials in Nuuk, which is heir to the Danish-Greenlandic Joint Council for Raw Materials that was based in Copenhagen and is now dismantled. This body deals with everything having to do with mineral extraction and has the final word when it comes to controversial matters relating to environmental policy.

Politically, the directorate has found itself on shaky ground. In July 2010, the public was informed that the Greenland autonomous government was planning to strengthen its environment department in order to share the burden carried until now by the Directorate for Raw Materials. This plan was welcomed by those who were hoping that Greenland would move toward a style of democratic governance comparable to that of our neighbours and friends to the east and west and would separate responsibilities for environmental policy and resource extraction into separate offices with very different mandates.

The leaders of the Directorate for Raw Materials did not agree with the plan. They were, and remain, adamant that Greenland's interests are best served by keeping administrative and environmental concerns related to the minerals industry under one and the same hat. They say this is more practical and efficient and point to what they call a global trend, exemplified by countries like the Philippines, Vietnam, Thailand, Sri Lanka and – surprisingly, North Carolina in the USA. (Incidentally, the North Carolina economy does not rest on mineral extraction, but is tied up with logging, timber, pulp and paper, high-quality furniture and tourism. North Carolina, the sixth most visited state in the US, is renowned for taking good care of its natural environment. Obviously, it is not the mining industry that calls the shots there, but rather those who care for the environment.) Russia, in a sense, is closer to Greenland than either Denmark or Alaska, inasmuch as Greenland and Russia share very long stretches of Polar Sea borders; there is a contention currently between us over the future formal authority over the North Pole itself. But Russia has no environment ministry at all and is consequently never mentioned in the present debate.

The NGOs of Greenland would certainly prefer an environmental policy debate in line with the traditions of Nordic and North American countries. But these organisations are few and weak and will remain so, presumably for many years. So the protection of the unique sea-, ice- and landscapes of Greenland, with their important arctic wildlife, are thus, for all practical purposes, entrusted to that one organ in the government administration whose primary interest and responsibility remains to support an efficient and profitable mining industry.

We are certainly reassured by the fact that the men and women who are appointed by our government to shoulder that responsibility, without any doubt, are among that great majority in this country who want to keep and protect our birds, fish, bears, whales, and vast reaches of unspoiled land, glaciers and lakes. All the same, a disturbing question does remain: should decisions about our natural environment all be made in an office whose prime responsibility is to deliver cold cash? At the end of the day, what is good governance? And how do we secure it?

As these lines are written, the Greenland public is left with doubts and confusion about the future. On one hand, our government recently assured us that the department for the protection of our environment is going to be strengthened in order to better face future challenges, specifically in connection with mining and drilling for seabed petroleum. But just two months after this comforting announcement, the minister responsible for mineral exploitation emphatically told the public that protection of the environment in connection with seabed drilling for crude oil was a matter for the minerals office to look after. Nobody else.

The public cannot help being confused. Even if the environment department is given more personnel and an increased range of responsibilities, an important part of the public will still be at a loss about what to make of it all.

At the same time, the situation is bedevilled by a further conundrum, a burden of oddly adverse tradition. The fact of the matter is that large segments of the Greenland population do not see the need for any kind of increased rule-setting in environmental matters at all. They have always been users of nature, and many resent what they experience as uncalled-for meddling on the part of outside specialists in matters of hunting and fishing. The

precautionary principle is not a part of Inuit tradition, and restrictive measures are not the most popular part of modern-day rule-setting.

However, as things stand, environmental rule-setting in connection with a newly opened goldmine or the dilemmas of seabed drilling for crude oil does constitute part of a large set of unavoidable requirements for democratic social and political development in Greenland. It is all mandatory, and there is no way of getting around it.

This thesis is a much appreciated and timely contribution to the hoped-for formulation of an ental environmental policy for Greenland in the decades to come.

Finn Lynge

Author's preface

This thesis represents the outcome of a three-year research project focused on the study of Strategic Environmental Assessment in Greenland. The PhD project is developed in a joint commitment between Aalborg University and the Government of Greenland, and with economic support from Alcoa Foundation. The three years of study has been a journey for me both academically during the process of learning and physically as I moved with my family to Denmark from Greenland during the first year. It has been three very exciting, innovating and challenging years which I have enjoyed very much, and I wish to acknowledge the abovementioned institutions which by their financial support offered me the opportunity to become a researcher. The research was carried out under the supervision of Professor Lone Kørnøv of the Danish Centre for Environmental Assessment at the Department of Planning and Development at Aalborg University and Klaus Georg Hansen, head of the Department of Physical Planning in the Government of Greenland's administration. My sincere appreciation goes to my supervisors for their guidance and their professional and personal support during the elaboration of the work represented by this thesis. I would also like to express my sincere thanks to Professor Tim Richardson, who asked the right questions to help me understand how abstract theory can be applied to empirical investigations, and to Dr Mat Cashmore of the University of East Anglia, for listening to my ideas and critically challenging them and thereby helping me to develop both the argumentation and content of my research. Also many thanks to my colleagues, who assisted me many times and gave me support in various ways. A special thanks to Sanne Vammen Larsen for academic and personal support.

Thanks to the employees in the Government of Greenland and Greenland Development A/S who openly and with interest contributed in my endeavour to understand the case studied. I am grateful for the strong platform for my research this offered. A special thanks to Flemming Drechsel and Peter Hansen for supporting my work, reading and commenting on my ideas and writing, and challenging my perspectives.

Further, many people in my private sphere supported and helped in different ways to make it possible for me to complete this thesis. I could not have done it without them. I would especially like to mention my mother, Kirsten Merrild, whom I thank for teaching me the importance of protecting the environment, for supporting my creative development and for helping out during my work on the thesis, to make it possible for me to work late hours and attend foreign conferences. I would also like to thank my father, Preben Lind Jensen, for encouraging me to be curious and interested in life and science, for always believing in me and supporting my choices.

And last but not least I want to express my deepest gratitude to my husband Tommy Hansen, father to my three children, for continuous support, for understanding and respecting my dreams and for giving me space in a busy life to elaborate and finalise this thesis.

Anne Merrild Hansen

Aalborg, December 2010

English summary

This thesis addresses the challenges Greenland faces with the desire for increased political autonomy, where environmental and industrial development is supposed to go hand in hand and not exclude each other.

Strategic Environmental Assessment is an internationally recognised tool to integrate proactively environmental considerations in policy decisions at the strategic level. Greenland has joined international agreements such as the UNECE Convention on Environmental Impact Assessment in a Transboundary Context and the latest UNECE Protocol on Strategic Environmental Assessment. Impact assessment is today partly implemented in Greenland, but experience with impact assessment at the strategic level is still very limited. The research which this paper presents is focused on the status and need for impact assessment of new industries in Greenland. Focusing on the effectiveness of conducting impact assessment for very large scale industrial projects, investigations concern the expectations and need for environmental assessment in Greenland today and what effect a specific impact assessment related to the planning of aluminium smelter operation has had and how the actors have influenced decision-making in which strategic environmental assessment was included.

Using approaches based on theories of value and effectiveness, and especially power theory, the research is covered in seven papers. The conclusion, based on the results identified in the different papers, indicates a need and desire from stakeholders in Greenland to integrate SEA at a higher level. In addition, it is concluded that a broad environmental concept needs to be included, defined by the relevant parameters in a given context. Further the scoping phase should be explained and argued in the reports. Moreover, it is concluded that there is a need for increased public involvement. It also concluded that the strategic environmental assessment for the aluminium smelter operation has addressed effectively and that it included environmental knowledge in decision-making both during the process where the course of the decision-making process was influenced, but also in relation to the final political decision on the location. Moreover, the environmental assessment resulted in a number of indirect effects, such as increased environmental knowledge, insight into the process, increased transparency and public participation and thus greater awareness on several levels. It is concluded that the effectiveness of the aluminium case study was secured by actors who affected the decision structure and through communication ensured that decision makers had access to environmental knowledge in unedited form.

It appears also that the decision-making regarding the location of the aluminium smelter did not happen according to the formal structure, which was based on the assumption that rational decisions are made. A big part of the strategic decision in contrast happened on an informal level. It was thus not the organisational structure that ensured the inclusion of environmental knowledge in the decision-making, but the actors' interactions with one another. It was informal communication that ensured that decision makers had access to environmental knowledge in unedited form.

This can be explained partly by the given conditions for the decision-making, as there was no prior experience in handling these types of projects. It can therefore by derived that the

actors to ensure that all interests are taken into consideration, needs to have a personal ownership and through their actions affect the existing structures, if it is required to influence decision- making.

Because different actors have different goals in the process, and hence different perceptions of the role of environmental assessment and when it is effective, it is important to be aware of the concept of effectiveness and what it means for the process when research is planned and conducted. In this thesis, the focus is on the official purpose of the strategic environmental assessment and investigating how environmental knowledge is included in the decision process and how it affects outcomes and structures. It could be interesting also to investigate in future research how the process affects the structures left with the players and enabling or restricting their actions.

The conclusion of this thesis challenges the future regulation of SEA in Greenland in relation to the performance requirements for content and process. But there is also another aspect that is relevant to take into account when considering how SEA can be regulated in Greenland in the future. It is the authority's organisational placement. Today, environmental impact assessment is handled in three different offices in the governmental administration, but if impact assessments are to be effective from an environmental and democratic point of view and not just cost effective and time efficient in relation to performance, it is important to take into account that there are limited human resources present in a country with less than 60,000 inhabitants. It can therefore seem appropriate to concentrate the administration and management of impact assessments in one place in order to build capacity and expertise in the special context of Greenland. However, there are several barriers to this today as the interest of economic growth requires a cost-effective handling of impact assessments, and the self-government agreement between Denmark and Greenland dictates that assessments related to the extractive industries are the responsibility of the Bureau of Minerals and Petroleum. There is thus call for a debate about the role impact assessment is expected to fulfil and to consider if it is possible to be effective under the structures which are to frame the regulation of the impact assessments.

Dansk resumé

Denne afhandling omhandler den udfordring som Grønland står overfor med ønsket om øget politisk selvstændighed, hvor miljøhensyn og industriel udvikling gerne skulle kunne gå hånd i hånd og ikke udelukke hinanden.

Strategisk miljøvurdering er et internationalt anerkendt redskab til at indtænke miljøhensyn proaktivt i forbindelse med politiske beslutninger på strategisk niveau. Grønland er tiltrådt internationale aftaler som UNECE Convention on Environmental Impact Assessment in a Transboundary Context og senest UNECE Protocol on Strategic Environmental Assessment. Miljøvurdering på projektniveau er til dels implementeret i Grønland, men erfaringen med miljøvurdering på strategisk niveau er stadig meget begrænset. Forskningen som denne afhandling præsenterer, fokuserer på status og behov for miljøvurdering af nye industrier i Grønland. Med fokus på effektiviteten af at udføre strategisk miljøvurdering for mega industri projekter, undersøges det hvilke forventninger og behov der er for miljøvurdering i Grønland i dag og hvilken effekt en konkret miljøvurdering relateret til planlægning af aluminiums produktion har haft og hvordan aktørerne i beslutningsprocesser har påvirket beslutningsprocessen i hvilken den strategiske miljøvurdering indgik.

På baggrund af analyser af værdier og effektivitet i forhold til miljøvurdering og med fokus på magtdynamik i beslutningsprocessen, er forskningsområdet dækket i 7 videnskabelige artikler. De samlede resultater peger på et behov og ønske fra aktører om at miljøvurdering i Grønland generelt løftes op på et højere niveau. Desuden skal der inkluderes et bredt miljøbegreb, defineret ud fra de relevante parametre i en Grønlandsk kontekst. Det konkluderes desuden i forhold til den studerede case vedrørende placering af en aluminiums industri, at den strategiske miljøvurdering effektivt har adresseret og sikret at miljømæssig viden blev bragt ind i beslutningsprocessen både undervejs i processen hvor retningen for beslutningen blev tegnet, men også i forhold til den endelige politiske beslutning om placering. Desuden har miljøvurderingen medført en række indirekte afledte effekter, som øget miljømæssig viden, indsigt i processen øget transparens og offentlig inddragelse og derved større miljømæssig bevidsthed og forståelse på flere niveauer. Dog vises det samtidig, at beslutningen omkring placeringen ikke foregik i henhold til den formelle strategi, der var baseret på antagelse om at beslutninger træffes ud fra en rationel model. Derimod foregik en stor del af beslutningsprocessen på uformelt plan. Idet kommunikationen ikke fulgte de formelle strukturer. Det var derfor ikke den tilstedeværende organisationsstruktur der sikrede miljøvurderingen indflydelse på processen, men derimod aktørernes indbyrdes interaktion idet det var den uformelle kommunikation, der sikrede at miljømæssig viden i uredigeret form fik adgang til beslutningstagerne..

Der reflekteres over det faktum, at forskellige aktører har forskellige mål i processen og dermed forskellige opfattelser af, miljøvurderingens rolle og hvornår den er effektiv er det altså vigtigt, at være bevidst om *hvis* effektivitetsbegreb der undersøges og hvad det betyder for processen. I denne afhandling er fokus på det officielle formål med den strategiske miljøvurdering og på at undersøge hvordan miljømæssig viden er inkluderet i beslutningen

og påvirker processens udfald og struktur. Det kunne tilsvarende være interessant at undersøge hvordan processens strukturer påvirker tilbage på aktørerne og giver mulighed eller begrænser deres handlinger.

Konklusionerne i denne afhandling udfordrer således den fremtidige regulering af miljøvurdering i Grønland i forhold til de krav der skal stilles til indhold og proces. Der er dog også et andet aspekt, som er relevant at tage med i betragtning når man overvejer hvordan miljøvurdering skal reguleres i Grønland fremover. Det er myndighedens organisatoriske placering. I dag finder miljøvurdering sted flere steder i Selvstyreadministrationen, men hvis miljøvurderinger skal være effektive set fra et miljømæssigt og demokratisk synspunkt og ikke blot kost-effektive og tidsmæssigt effektive i forhold til udførelse samtidig med at de begrænsede menneskelige resurser der er til stede i et land med under tres tusind indbyggere, tages i betragtning, så kunne det virke hensigtsmæssigt at samle myndighedsbehandling og administration af miljøvurdering, tilsyn og monitering for derved at opbygge en kapacitet i form af ekspertise i miljøvurdering i den særlige grønlandske kontekst. Der er dog flere barrierer for dette i dag, da interessen for økonomisk vækst fordrer en kost-effektiv behandling af sager ligesom selvstyreaftalen mellem Danmark og Grønland motivere at myndighedsbehandlingen på råstofområdet bevares i Råstof Direktoratet. Der er således grund til at tage en politisk debat omkring hvilken rolle man forventer at miljøvurdering skal udfylde og om den rolle kan udfyldes via den struktur miljøvurderingerne kommer til at indgå i.

1. Introduction

In recent history Greenland has undergone significant constitutional, societal and cultural changes, which have led to a situation today where the wish for independence from Denmark is more present than ever. Now there are strong indications that economic growth and thereby independence is likely being realised through the implementation of new processing and extracting industries. The implementation of very large-scale industries also carries the potential of environmental damage and societal costs, however. This challenges the administration when it handles applications from large international companies that are interested in operating in Greenland. The dilemma of fixing priorities between, on the one hand, social and environmental costs and, on the other hand, stagnation in economic development, is known worldwide. Based on the international experience, it is unquestionable that decisions crucial to the future development of Greenland are presently being made.

The 'mega industries' likely to become established in Greenland include several projects of mineral extraction and exploitation of hydrocarbons. There is an increased global focus on Greenland in this regard, as it is located physically in an area of the Arctic Sea as yet unexplored, which is expected to contain the Earth's last large untapped reservoirs of fossil fuel, and Greenland is known to contain a wealth of unexploited mineral deposits. The increasing global demand for minerals and fossil fuels brings, among other things, the opportunity of implementing new mega industries in Greenland.

Currently, the new mega industry most likely to become established in Greenland is aluminium production. The planned production, standing alone, can influence and cause irreversible changes on society, the economy and environmental conditions in Greenland. One of the world's largest aluminium producing companies, Alcoa, is presently negotiating with the Government of Greenland, as it is very interested in accessing Greenland's potential hydro power to feed the high energy demanding production process. The plan is to ship bauxite to Greenland from South America, and then to export aluminium from Greenland. Implementation of the planned aluminium smelter will bring jobs and economic growth but at the same time it has the potential to cause significant societal changes and environmental impacts on a scale that Greenland has not yet faced through a single project.

Decisions regarding the implementation of new mega industries like aluminium production, mining and oil exploration can bring a desired independence from Denmark through economic growth. However, at the same time the implementation of these mega industries can influence the natural and societal environment in Greenland by causing changes in settlement patterns, business structure, allocation of goods, health conditions, physical planning etc. on a scale as yet unknown and hard to foresee.

One of the tools introduced to meet the challenge of making more sustainable decisions in Greenland in this regard is Strategic Environmental Assessment (SEA). There is no legal demand or requirement for conducting SEAs in Greenland today, but still different types of impact assessments have been carried out in relation to specific projects, plans and programmes in order to include environmental considerations in decision-making. Based on the challenges for decision-making when new mega industries are planned, this thesis

focuses on the role and function of the as yet non-mandatory SEA in decision-making regarding implementation of new mega industries.

1.1 Background and research aims

The overall background for establishing the research project was governmental concern in Greenland regarding environmental protection when new mega industries are planned. As Greenland has no legislation or guidelines in place to handle impact assessments at a strategic level, the government officials were interested in having a study carried out with focus on SEA of mega industries in Greenland. This research project is hence rooted in the environmental and democratic challenge of planning and assessing the implementation of an aluminium production in Greenland.

The study is carried out with a theoretical approach that uses theories of power, since power dynamics has been shown to influence the course of the decision-making before a final decision was made and hence the effectiveness of the SEA.

It is generally recognised that SEA as a tool in political decision-making processes has the potential to be politicised and subject to the influence of power. Still there is a lack of research related to the influence of power dynamics in SEA processes. The aim of the thesis is to explore on a specific level the potential for the effectiveness of SEAs in strategic decision-making when industrial programmes are implemented in Greenland. Based on a value rational approach, the study identifies patterns and tendencies in SEA carried out in relation to mega industry in Greenland in order to investigate to what extent, and how, SEA is effective in securing environmental considerations in decision-making, and to investigate how and why the SEA influences the outcome of decision-making.

1.2 Arrangement of the thesis

The thesis is structured in two main blocks, (1) a review and (2) a collection of articles. **The first block** covers the essence of the research undertaken. After this introduction the motivation of the research questions is described in chapters 2 and 3. Chapter 2, 'A Time of Change in Greenland', introduces issues that motivated the research topic and thus presents the context in which the research has been carried out. Then the state of the art in research related to SEA effectiveness and power is introduced in chapter 3, 'Impact assessment as a tool to include environmental concerns in strategic decision-making'. The methodology and approach to the research is then presented in chapter 4, 'Research Strategy and Method' and chapter 5, 'Theory of power and structures', which describes the overall research design and approach. An account of the overall theories and methodology drawn upon in the research is given. Methods are also further described and discussed in relation to the different parts of the research in the papers in the second block of the thesis. The results of the research undertaken is presented in chapters 6 and 7. First, the case that forms the empirical background material for the study is described in chapter 6, 'Presentation of the case study, Aluminium Programme and SEA'. Chapter 7 assembles the main results from the papers structured upon the research questions they contribute to answer.

Finally, based on the assembled results, I look back at the research questions and broaden out the discussion of how the research results respond to them. In the conclusion, I discuss and reflect on the contribution of this paper to the field of SEA in Greenland and to the field of SEA

research in general, and reflect on the future role and location of impact assessment regulation in Greenland.

The second block contains seven papers that represent the research undertaken. The first and the third papers are in Danish and are published in a Danish popular-scientific journal. The second paper is a peer-reviewed conference paper presented at the annual conference of the International Association for Impact Assessment (IAIA) in Perth, Western Australia, in 2008, published on the IAIA's webpage. Papers 4, 5, 6 and 7 are all submitted to peer-reviewed international scientific journals. One is published, and the other four are all accepted for publication. The papers are as follows:

1. Hansen, K. G. and A. M. Hansen (2008). Miljø og megaindustri: Strategisk Miljøvurdering af Grønlands potentielt første aluminiumssmelter (Environment and megaindustry: Strategic Environmental Assessment of Greenland's potential first aluminium smelter), *Tidsskriftet Grønland*, No. 2-3, pp 72-84, August 2008, Det Grønlandske Selskab, published.

2. Hansen, A. M., L. Kørnøv and K. G. Hansen (2008). Mega Industry and Climate Change: need for a Higher Level SEA, Proceedings of the IAIA08, Conference, 'Art and Science of Impact Assessment'. Peer reviewed.

3. Hansen, A. M. and C. Vium (2009). Værdiportrætter i en tid med klimaforandring og industriudvikling ('Value portraits' in a time of climate change and industrial development), *Tidsskriftet Grønland*, No. 4, pp 304-317, December 2009, Det Grønlandske Selskab, published.

4. Hansen, A. M. and L. Kørnøv (2010). A Value rational view of impact assessment of mega industry in a Greenland planning and policy context, *Impact Assessment and Project Appraisal*, Vol. 28, pp 135-145, June 2010. Peer reviewed, published.

5. Hansen, A. M. (2010). Evaluation of Strategic Environmental Assessment effectiveness: In the planning of an aluminium reduction plant, *Journal of Environmental Planning and Management.* Under review, accepted.

6. Hansen, A. M., L. Kørnøv, T. Richardson and M. Cashmore (2010). The significance of structural power in Strategic Environmental Assessment, *Environmental Impact Assessment Review*, special edition for 2011 on power and planning, Under review, accepted.

7. Kørnøv, L, I. Lyhne, S. V. Larsen and A. M. Hansen (2010). Change agents in the field of SEA Submitted to *Journal of Environmental Policy and Management*, under review, accepted

The first two papers concern the status of SEAs in Greenland. The papers present regulation and practice for carrying out impact assessments when new industries are planned. Hansen and Hansen (2008) describe the planning and process of carrying out an SEA of the proposed aluminium plant in Greenland. Hansen, Kørnøv and Hansen (2008) presents a review of the impact assessments conducted in relation to former and actual projects programmes and

plans in Greenland. The strategic level of the assessments is analysed as well as their scope in terms of the parameters included.

The third and fourth papers investigate how practice fits with the expectations and needs expressed by professionals, politicians and the public. Hansen and Vium (2009) focus on public values and concerns in Greenland today regarding the future. The article is a snapshot of local concerns in a specific area of Greenland, based on interviews with thirteen local people. Hansen and Kørnøv (2010) reflects on the challenges to the impact assessment system of Greenland in a planning and policy context, based on the values and expectations of Greenlanders who work with impact assessments. The paper discusses whether and how SEA could contribute to securing good environmental management and support sustainable development. The paper includes a description of the environmental regulation. Since it was written, new initiatives have been taken towards implementation of the recommendations. The present and updated status of the regulation of environmental protection when new industries are planned is presented in chapter 2, 'A Time of change in Greenland'.

The fifth and sixth papers are specifically focused on the use of SEA in decision-making when new industries are planned. Based on the case study of an aluminium reduction plant in Greenland, their focus is on how power among actors influences SEA effectiveness when key decisions are being made. Hansen (2010) presents an evaluation of the effectiveness of the aluminium SEA. Based on the formal objective, the focus is on investigating how the SEA impacted on the inclusion of environmental knowledge in the planning processes and decision-making, when a site for an aluminium plant was selected. Hansen, Kørnøv Richardson and Cashmore (2010) presents a study of how structural power facilitates or constrains the influence of actors upon decision-making and SEA.

The seventh and last paper is distinguished from the other papers as it does not regard the case of Greenland, but reflects on the effects of conducting research and case studies in interaction with the milieu where the research is carried out. It is based on an empirical study of three cases including the case study of the aluminium plant. The paper is focussed on the question of: 'What does acting as a change agent within the field of SEA involve, and what potentials and relevance does it have for research and practice?'.

Some overlap and duplication can be found in the papers, primarily regarding the introduction to the topic and the case study, as it was necessary for the papers to be able to stand alone when published.

2. A time of change in Greenland

The changing political context in Greenland and subsequent challenges in relation to environmental regulation is the primary motivation for the research undertaken. The initiating change for the present research has been the exploration of a possible aluminium smelter operation in Greenland, which is the case studied. The prospect of such mega industry in Greenland was publicly presented and discussed for the first time in 2006, and is expected to have extensive impacts on a broad range of environmental, economic, social and political factors. Since 2007 various changes have happened – due to the planned aluminium smelter operation but also as a consequence of other societal and political developments in Greenland.

This chapter presents perspectives on some of the contextual changes facing Greenland and how different institutions and practices have responded to these changes. First an introduction to changes in the political constitution is given. Next, how the business strategies are shifting their focus, hereunder supporting aluminium production as a way forward for economic growth, is described. Finally in the third part of the chapter, the way development is influencing environmental legislation and impact assessment practice is described.

2.1 Colonialism and changing constitutions

The Inuit people living in Greenland today are descendants of the Thule Culture Inuit people who came to Greenland from Canada about 1100 years ago. The Inuit people had a hunter-gatherer culture, living mainly from hunting seals, reindeer, fish and birds. It was a nomadic culture, moving after the localisation of animals to catch both during summer and winter. The Inuit had an animistic worldview, believing that everything in nature had its own spirit to be respected. When the catch failed, it was due to unwritten rules had been broken by humans (Dahl 1986). In this philosophy, humans and nature were seen as dependent on each other. The Inuit philosophy was challenged by Christianity when the Danish missionary Hans Egede came to Greenland, with the support of the king of Denmark, in 1721. The missionary work went hand in hand with trade interests, with the dual purpose of trading and Christianising, and thus Greenland became a Danish colony. Denmark ruled the territory and, among other activities, controlled all trade with Greenland. In 1953 Greenland was incorporated under the Danish Constitution and was thus no longer formally a colony but an equal part of Denmark (Dahl 1986, Skjelbo 1995).

During the 1960s and 1970s Greenland underwent a rapid development similar to the development that western countries had taken centuries to go through (Dahl 1986). Many people moved from villages and into cities and people went from being hunters to working in a broad number of service-related professions. Many, especially young people, were dissatisfied with Denmark having authority over and in Greenland. Therefore, a claim rose from the public for the native Greenlanders to have political influence on the highest level (Lyager 2002, Viemose 1976). As a reaction to this, Greenland gained a Home Rule Government in 1979. This meant that the Greenlanders could now decide on political questions regarding internal affairs in Greenland, while Denmark still presided over international affairs, defence policy, police, courts and commodities and other matters. As a

part of the Kingdom of Denmark, Greenland received financial subsidies to cover the expenses related to the new administration areas and the related obligations (Dahl 1986, Lyager 2002, Skjeldbo 1995).

With the implementation of the Home Rule, Greenland became less, but still strongly, influenced by Denmark both cultural, politically and economically (Dybbroe 1989). The societal modernisation in Greenland brought greater cultural homogeneity in the population of mixed ethnicities; Inuit and Danes. Life in Greenland became a part of a Greenlandic/Danish reality where the national television channel showed a combination of broadcasts from Denmark and Greenland; in public schools the children are educated in both languages and at the grocer you can buy milk from Danish cows that grazed thousands of kilometres away. Even though the life of Greenlanders this way was strongly influenced by Danish culture they never to the same degree had been trying to assert themselves as different from the Danes and Greenland as distant from Denmark (Bjørst 2008). There has been an increasing engagement to protect distinctive cultural and economic interests, for example, in relation to hunting, which were not compatible with the Danish guardianship (Tróndheim 2002). The Home Rule administration consequently worked with dedication towards gaining more political independence from Denmark. On 25 November 2008 there was a referendum on a second step towards independence from Denmark. By 21 June 2009 an extended government referred to as 'Self Government' replaced the Home Rule (Government of Greenland 2009). In the agreement between the Government of Greenland and the Government of Denmark, it is specified that the Government of Greenland can now decide when to take over the administration of various areas of responsibility. However, in doing this, Greenland must cover the related expenses from the national budget, as the size of subsidies from Denmark to the Government of Greenland is set and cannot be negotiated. As Greenland is still dependent on subsidies to maintain its lifestyle and gain autonomy, a prerequisite for a future independent 'State of Greenland' is hence increased economic growth (Government of Greenland 2009).

Just before the Self Government was implemented, an election for the parliament was carried out in Greenland, on 2 June 2009. The 'Siumut' party, located in the middle of the political scale, had won all previous elections and occupied the Cabinet with shifting coalition partners in the 30-year period of the Home Rule, but at the last election in the time of the Home Rule, a new party won the public trust and votes – the left-wing party Inuit Ataqatigiit (IA). In coalition with two (slightly) right-wing parties: 'Demokraatit' and 'Kattuseqatigiit', together they gained the majority in the parliament. The new coalition took over the Cabinet 14 days before Self Government was enforced. The new coalition made it clear from the start that they would work for further political and cultural autonomy for Greenland and that the strategy to get it was through education and through a more self-sustaining economy. In the coalition agreement between the three parties they stated:

> With the introduction of Self Government and the ambition for a self-reliant economy, enhancing the economy will be essential for the coming years. (Greenland Government 2009:6).

The political focus in this regard was and is primarily on development of two main pillars specifically pointed out in the coalition agreement. The first is 'Mines, Oil and Mega Industry' the other is 'Tourism' (Coalition agreement 2009).

2.2 Oil, minerals and aluminium production

As was briefly outlined in the former section, Greenland experienced major changes in political status and constitution during the twentieth century. The occupational structure also underwent significant changes, as a traditional Inuit nomadic hunter-gatherer culture dependent on the hazards and resources of nature was superseded by a modern commercial development. Today few Greenlanders can make a sufficient living as hunters or fishermen that would make it possible to uphold a modern lifestyle (Rasmussen 2005, 2007). Greenland has not yet experienced a general industrialisation; even though parts of the fishing fleet and related production have been modernised, primarily unprocessed products were exported in 2010. Many jobs are located in the service sector and in the public administration. There are no present indications that the existing industries or businesses will be able to increase the Brutto National Product to the extent that would make it possible to gain political independence. However, new tendencies are bringing the possibility of changes to the existing industrial structure in Greenland. The global market prices for minerals and fossil fuels are increasing as the accelerating industrialisation of countries in Asia compounds an increasing demand for raw materials. As Greenland contains a wealth of natural resources (minerals, oil and hydropower sources) it can position itself as a likely supplier of industrial demands (Secher 2005). Combined with the increased finds of deposits in Greenland, both due to reduction of glaciers and due to detailed geological mapping, the interest in exploitation in Greenland is the highest ever (Ahlstrøm 2009, Johansen et al. 2001).

Key figures related to the development in exploration and exploitation of minerals and petroleum in Greenland is presented in Table 2.1, showing that the number of exploration licences has increased dramatically from 17 to 76 in eight years. The number of exploitation licences which are active permits to mine has increased by four from zero. Further the Bureau of Minerals and Petroleum explains on its web page that 17 exploration licences are currently under application (Bureau of Minerals and Petroleum 2010).

	2002	***2003***	***2004***	***2005***	***2006***	***2007***	***2008***	***2009***	**2010**
No. of exploration licences (granted)	17	19	22	33	29	63	67	71	76
No. of exploitation licences (granted)	0	1	1	2	2	2	3	4	4
No. km² under exploration	5,956	5,714	8,560	12,986	14,782	23,379	24,578	19,306	*

*Table 2.1: Mineral exploration in Greenland 2002–2010. The calculation is based on the exploration commitments according to the licences. *Currently being assessed. (Bureau of Minerals and Petroleum 2010)*

Another new industry likely to commence operation in Greenland within the next few years is aluminium production. Greenland possesses large potential for hydropower, which has made it economically and environmentally attractive for energy-intensive industries to operate there, as they also are influenced by the increased prices for fossil fuel and image management as a green industry. In 2007 a Memorandum of Understanding (MoU) was signed by the Greenlandic Prime Minister and the Minister of Business and Development and representatives of the company Alcoa, which is one of the largest aluminium producing companies in the world. The MoU regards corporation on the preparation and establishment

of an aluminium smelter in Greenland. The aluminium plant and related projects including constructions like dams, roads, transmission lines etc. is the object of the case study on which the research of this thesis is conducted. The content and planning of the aluminium reduction plant is further described in the presentation of the case in chapter 6.

Mining and oil extraction, together with aluminium production, are new industries that all have the potential to bring new jobs and long-term revenue to the Greenlandic society. They also have the potential to have a significant impact on the environment and society on a yet unknown scale. The Self Government of Greenland has, as one of its first initiatives, launched the withdrawal of the administration of mining and oil exploration from the control of Denmark, which indicates the interest in this field. Still the politicians express a wish that the development should happen in a sustainable manner. In the coalition agreement it is framed as follows:

> The prospect of higher global prices on minerals and fossil fuels has renewed the focus on exploitation of our non-living resources of which the economic consequences could be wide ranging. It is therefore very important that mineral exploration policy of the *Naalakkersuisut* (Cabinet) is coordinated with the industrial policy, environmental policy, educational policy, language policy and integration policy.
>
> We accept exploitation of the non-living resources as an important potential – though not at the expense of our environment.
>
> When Self Government is a reality and Greenland takes over responsibility for the non-living resources, it will be important to have legislation that ensures people's direct influence and involvement in the decision-making processes. (Greenland Government 2009: 16)

2.3 Environmental regulation and Impact Assessment

Together with the political wish for growth, there is, for many reasons, also a conscious and general interest present in Greenland that the development should happen in a responsible and sustainable manner from both a social and an environmental perspective. This is reflected in statements in the media from both members of the Government of Greenland, NGOs (e.g. Avataq, Narsaq Earth Charter and the Association against Uranium Mining) and other interest groups (e.g. the Inuit Circumpolar Council and the Greenland Employers Association) but also the public in general. The chair of the NGO Narsaq Earth Charter, Finn Lynge, stated in a conference paper:

> … paradoxically, independence and growing autonomy for that matter – can only be seen as economically viable in contravention of what is strongly emerging as universally accepted mandatory environmental policy-making in the rest of the world – a process none of us would think of contradicting on the international scene. We are here touching upon a very big area of contention: the conflict between the need for industrial development read: future political independence of Denmark needing big money and on the other hand the basic, unquestioned desire we all harbour to keep our marvellous country unspoiled for our children and grandchildren. The problem is as simple as it is awful: we can't have our cake and eat it. (Lynge 2008)

In my view this quote exemplifies how environmental concerns regarding the ongoing development in Greenland are seen as conflicting with the desire for political independence, if environmental policy-making is not implemented. The quote expresses a general concern in Greenland, which is also current in relation to the potential aluminium production. The production and export of aluminium can bring a significant increase in tax revenue. Further, more than one thousand new jobs will be created together with a new business sector. Aluminium production hence can make Greenland less sensitive and less dependent on the fishing industry and related changing conditions on the global market. At the same time as aluminium production offers this development, and hence a step towards political independence, however, it can cause significant and irreversible impacts on society and the environment.

Parameter	***Potential significant environmental impacts of aluminium smelter in Greenland***
Nature	Disturbance of breeding areas for several bird species Disturbance of reindeer paths and breeding areas Disturbance of areas of muskoxen Destruction of rare plants Disturbance of areas of common seal Disturbance of trout species
Environment	Change in water environment and suspended materials in fjords. Change of river structures and sedimentation. Reduction of the water resource for drinking water Wastewater SO_2 emissions to air Fluoride emissions to air CO2 emissions to air Other particle emissions to air PFC gasses to air PAH emissions to air Nitrogen oxide emissions to air Carbon monoxide emissions to air Cyanide emissions to air Noise
Culture	Changes in landscape Destruction of cultural heritage Attrition of cultural trails
Regional Development	Increased migration Changes in mobility of labour Changes in settlement patterns Changes in economical balance Changes in social networks Change in cultural coherence

Table 2.2: Potential impacts of aluminium smelter operation. Developed from data in Greenland Home Rule (2010)

Table 2.2 gives an overview of the potential environmental impacts an aluminium smelter could cause in Greenland. The impacts are those identified as significant in the scoping phase of an SEA carried out in relation to the planned aluminium smelter operation.

Additional significant impacts on health and social life can be expected as a consequence when a large number of male migrant workers are employed. Such impacts are not included in the SEA, though. In Greenland the largest city has a population of 16,000. During the construction phase, the aluminium smelter operation will bring up to 3,000 migrant workers to Greenland, as the labour force needed is not present in Greenland. During operation, the aluminium smelter is expected also to bring migrant workers to Greenland. Problems as a consequence of this can be increased venereal diseases, prostitution, crime and violence (Copenhagen Economics 2010, Kleist et al. 2010).

Most of the impacts identified, presented in Table 2.2, can be mitigated or even avoided if impacts are identified and vulnerable areas are identified and protected early in a decision-making process that ensures that environmental concerns are proactively included when strategic decisions are made concerning questions like if, which, how much, when and where aluminium production is implemented. Impact assessment is both a technical scientific process and a political process. As Finn Lynge also points out in the quote above, there is as yet no legal requirement or environmental policy-making that deals with these types of environmental concerns to secure sustainable development when new mega industries are planned in Greenland.

Worldwide the concept of impact assessment is implemented into national environmental protection strategies as a tool to promote sustainable development (Therivel 2004). There is a general recognition of the need for impact assessment of the implications of policy, planning and programme alternatives at an early stage in decision-making processes. SEA has emerged in this regard as a structured proactive process to strengthen the role of environmental issues in political decision-making through the assessment of the environmental impacts of policies, plans and programmes (Noble and Storey 2001, Verheem and Tonk 2000).

In Greenland the use of environmental impact assessment (EIA) is still in its early stages. In relation to the extractive industries (minerals, gas and petroleum) there is some experience with EIA, but for many years the EIAs have been conducted without fulfilling basic internationally recognised principles, like assessment of alternatives and public participation (Hansen 2008). As Greenland is only presently developing impact assessment legislation on the project level, only a few non-mandatory EIAs have been carried out for large infrastructure projects like hydroelectricity plants. The policy, planning and programme levels have so far been excluded from mandatory impact assessment (Hansen and Kørnøv 2010).

The administration of the environmental protection of industrial activities, since the implementation of the first Nature and Environmental Protection Act in 1982, has been carried out pursuant to two different sets of regulations, depending on whether the activity was within the category of ‘extractive industries’ or ‘other industries’. The regulatory system is illustrated in Figure 2.1.

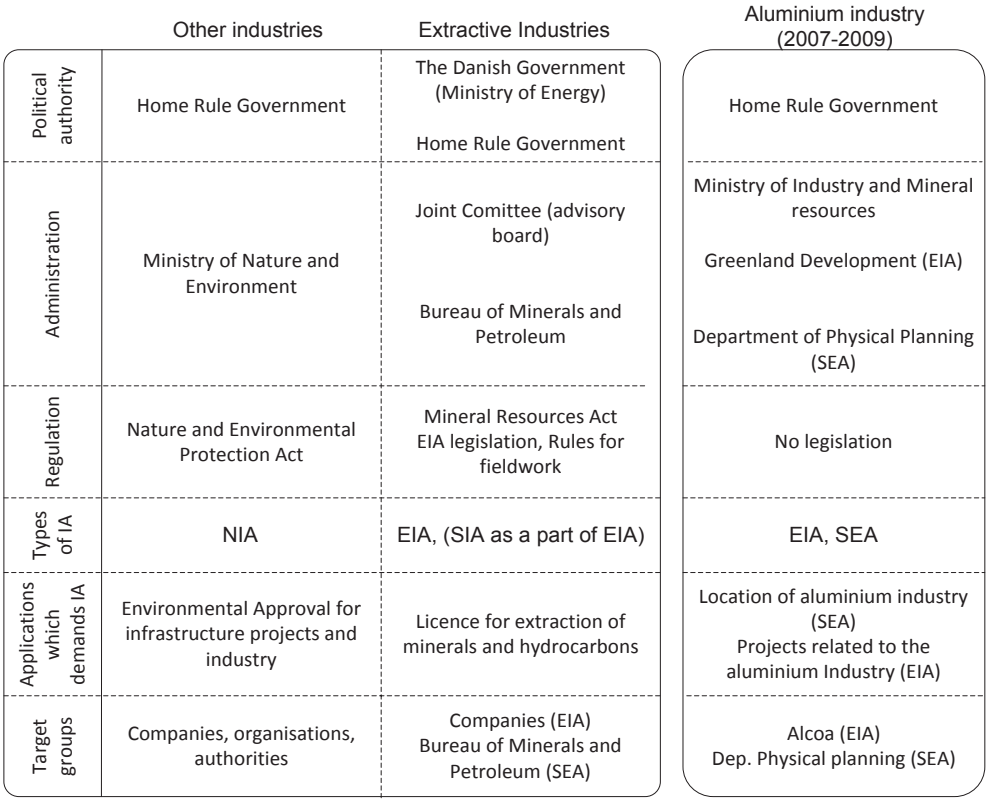

Figure 2.1: Impact assessment regulation in Greenland during the Home Rule period (1982–2009). NIA = Nature Impact Assessment; SIA = Social Impact Assessment. Developed from data in Bureau of Minerals and Petroleum (2000; 2007), Greenland Government (2007), Hansen (2008; 2010) and comments from Jane Rusbjerg and Jens Hesseldahl from the Bureau of Minerals and Petroleum, .

Extractive industries: Until 1998 applications for extractive industries were regulated under joint Danish and Greenlandic administration. A joint committee of Greenlandic and Danish politicians was created which served as the parliamentary forum and advisory board (Hansen 2008). The political authorities were the Danish Energy Agency and the Home Rule in Greenland, while the administration was located in Denmark, being a part of the Danish administration. In 1995 the office was physically moved to a location in Greenland but continued to be under Danish administration. In 1998 the administration was formally transferred to Greenland and the Bureau of Minerals and Petroleum was created (Rusbjerg and Hesseldahl 2010). To gain approval for licences to extract minerals and hydrocarbons in Greenland, according to the Mineral Resources Act and regulative guidelines for fieldwork and EIA, companies should conduct EIAs as a part of their feasibility studies. What today is known as Social Impact Assessment (SIA) was included as a minor part of the EIA in that period (Bureau of Minerals and Petroleum 2007; Rusbjerg and Hesseldahl 2010). Specific guidelines on EIA were implemented in 2006 concerning hydrocarbon extraction, however, the earliest version of the EIA guidelines for seismic data was implemented in 1998. For hard minerals EIA guidelines were implemented in 2007. These are guidelines that companies must follow. Moreover, rules regulating fieldwork have been applied since 1993 which also regulate the environmental protection during both exploration and exploitation.

Environmental assessments have been made since the early 1970s, hence the concept is not new to the mining area in Greenland. However, the Mineral Resources Act makes no requirements for public involvement or public access to information besides a decisional declaration (Hansen 2008).

Other industries: In the same period, from 1982 to 2009, other industries were obliged to apply for environmental approval by the Ministry of Nature and Environment. The National Environmental Protection Law, Act No. 29 of 18 December 2003 on the Protection of Nature, required that enterprises causing significant pollution, with emissions to earth, water or air, should apply to the environmental authority (The Home Rule) for environmental approval (Hansen 2008). The enterprises concerned were listed in Annex 1 to the law, and included, for example, animal husbandry, storage, disposal or treatment of waste, processing of biological raw materials and chemical manufacturing. There were no general limits for emission values, but the Home Rule could set limits for the individual company. Regarding public involvement, the Act on the Protection of Nature did not include requirements for public participation during the assessment of an application for environmental approval (Hansen 2008).

Aluminium Industry: In 2007 the prospect of an aluminium smelter became a reality and in recognition of the potential impacts this industry could cause, it was decided to handle this differently from the existing and known activities (Hansen 2008). It was decided that a non-mandatory SEA should be carried out early in the process and corresponding EIAs for the different projects included later in the process. The administration was placed in a cross-departmental SEA working group and in a company under the Home Rule called Greenland Development A/S, which had the task of collecting data and negotiating with Alcoa. The political authority, as for the other EIA areas, was the Government of Greenland.

In June 2009 Greenland gained its Self Government as described above. One of the first initiatives taken was to repatriate the full administration of minerals and hydrocarbons. This was achieved with the decision on a New Mineral Act on 1 January 2010. The New Mineral Resources Act includes the requirement that all exploration permits should include Social Impact Assessments (SIAs) and EIAs. Both the terms of reference and the assessment reports should be accessible to the public. The joint committee was closed and the Bureau of Minerals and Petroleum now refers directly to the Minister of Industry and Mineral Resources. The new administration is illustrated in Figure 2.2.

	Other industries	Extractive Industries	Aluminium industry
Political authority	The Government of Greenland	The Government of Greenland	The Government of Greenland
Administration	Ministry for Domestic Affairs, Nature and Environment Department of Nature and Environment	Bureau of Minerals and Petroleum	Ministry of Industry and Mineral resources Greenland Development (EIA) Department of Physical Planning (SEA)
Regulation	Nature and Environmental Protection Act	New Mineral Resources Act EIA legislation, SIA legislation Rules for fieldwork	No legislation
Types of IA	NIA, EIA	SIA, EIA	EIA, SEA
Applications which demands IA	Environmental Approval for infrastructure projects and industry	Licence for extraction of minerals and hydrocarbons	Location of aluminium industry (SEA) Projects related to the aluminium Industry (EIA)
Target groups	Companies, organisations, authorities	Companies (EIA) Bureau of Minerals and Petroleum (SEA)	Alcoa (EIA) Dep. Physical planning (SEA)

Figure 2.2: Impact assessment regulation in Greenland, 2010. Administration of mineral resources was transferred to Greenland on 1 January 2010. Developed from data in Bureau of Minerals and Petroleum (2007), Greenland Government (2007), Greenland Parliament (2009) Hansen (2008; 2010).

As Denmark is a member of the UN, and Greenland still forms a part of the Kingdom of Denmark, relevant conventions and protocols must be endorsed by Denmark with a remark of exception or inclusion for Greenland. Greenland has endorsed the UNECE Convention on Environmental Impact Assessment in a Transboundary Context, and a formal system for Environmental Impact Assessment (EIA) is due to be implemented in Greenland. Greenland did not consent to the UNECE Protocol on Strategic Environmental Assessment or in any other way endorse international agreements that require implementation of SEA in 2006 when the Alcoa contacted the Home Rule. The new coalition government has, however, shown initiatives to introduce new and mandatory environmental assessment on the legislative level. In the coalition agreement it was stated that:

> All future decisions in the Parliament of Greenland shall contain environmental assessments. … information and participation of the public in relation to the development of new industries is important and will be effectuated. (Coalition agreement 2009; translated from Danish by the author)

There is still no formal requirment to conduct SEAs in Greenland at the time of writing this thesis. However, in June 2010, the Prime Minister of Greenland, Kuupik Kleist, officially stated that Greenland would now consent to the UNECE Protocol on Strategic Environmental

Assessment. Greenland will hence have to develop legislation and guidelines for the preparation of impact assessments at the strategic level.

SEA on the international level is extensively put into practice, and the principles, techniques and application of SEA have been debated and researched (Stoeglehner et al. 2009). Still there has been hardly any research conducted regarding the use of impact assessment in Greenland. Dusik (2009) carried out the most comprehensive research so far, when the level of impact assessments conducted in the member countries of the Overseas Countries and Territories Association (OCTA), including Greenland, was investigated. It was concluded that there was a lack of impact assessments carried out on the strategic level in Greenland.

In recent years several scholars (e.g. Bina and Wellington 2005, Cashmore and Nieslony 2006, Hilding-Rydevik and Bjarnadóttir 2007, Partidário 2005) have argued the need to understand the implementation context of SEA, as well as to adapt SEA to such contexts to ensure that SEA is successfully implemented. Thissen (2000) urges that empirical research should be undertaken into the characteristics and courses of the decision processes in order to operationalise SEA. It is therefore important to investigate the SEA for aluminium, which is the first to be carried out on the strategic level in Greenland, to identify the characteristics of the decision-making process in the specific Greenlandic political and administrative context before SEA is implemented.

Context covers a broad number of issues and can be investigated in various ways. The relevant contextual factors can hence vary from one case to another, and this is also the case regarding SEA (Fisher 2004, Hilding-Rydevik and Bjarnadóttir 2008). I have chosen to cover the context by identifying relevant issues from a value rational perspective of local SEA professionals and the public. The thesis is therefore also contributing to create a picture of the context in which SEA is to be carried out in Greenland in the future.

2.4 Problems and challenges

Summing up, Greenland faces potentially significant industrial development, which could cause unforeseen induced environmental and societal effects. Implementation of the Self Government has brought a new constitutional status where Greenland holds the power to decide when new areas of administration are transferred from Denmark to the Government of Greenland. At the same time the new political coalition in government has the stated political objective to work for a more independent Greenland. These changes have led to a situation where economic growth is motivated strongly not only by the desire for higher living standards in general, but also in the quest of gaining status as an individual state. New companies, primarily within the extractive industries, are interested in settling in Greenland and can bring the possibility of economic growth. If implemented on a large scale they might change the business structure, and at any scale they will bring significant and irreversible impacts on the environment and society. This way, important strategic decisions are being made now and in the near future regarding the future development of Greenland. There are political intentions to ensure that development happens in a sustainable manner. As an indication of this, EIA legislation is presently being developed to secure environmental protection when new projects are implemented, but a need is also recognised for impact assessments at a more strategic level. SEA is explored as a tool in this regard and just recently the Government of Greenland decided to sign the UNECE Protocol on Strategic Environmental Assessment.

Regarding the planning of an aluminium smelter operation, a political decision was made to have a non-mandatory SEA carried out in relation to the project. The intention was to have a critical and independent analysis made that could identify environmental impacts. The SEA should feed in to the decision-making regarding the location of the aluminium smelter and related buildings, the hydropower plant, infrastructure and other constructions, to make it possible for the decision-makers to make an informed decision where economic, technical, social and environmental consequences were identified and taken into consideration. Seen in the light of the ongoing industrial development in Greenland and the present wish to implement SEA legislation while there is a lack of experience regarding environmental considerations on the strategic level, it is very important and interesting to learn from the SEA and identify its role and function in the decision-making process regarding the location of the aluminium smelter. The focus of this thesis is therefore on questions related to the effectiveness of this specific SEA. Was it effective? How did it influence decision-making, and why? To explore these questions the focus in this thesis is on Greenland and the effectiveness of SEA. The approach is further explained in the 'State of the art' regarding SEA effectiveness research presented in chapter 3, followed by the research goals and questions. The state of the art is built around themes found specifically relevant for the problem field identified above.

3. Strategic Environmental Assessment as a means to include environmental concerns in strategic decision-making

The previous chapter described the main focus of this research as the influence of SEA on decision-making in the case of aluminium production in Greenland. The purpose of this chapter is to create a conceptual frame for the research, as the concepts presented in this chapter are referred to in the descriptions of the case study and the results in the following chapters as well as in the papers. The purpose is also to describe the major ideas in the state of the art relevant for the thesis as a basis for explaining how the research contributes to it. The description is built around the following themes; SEA and decision-making, effectiveness and power. Quality criteria and assurance of good quality in SEAs, as well as the inspiration and good practice for carrying out SEAs, are issues that are not discussed, as they are not the topic of the research. The focus is instead on the role of SEA in decision-making.

This chapter gives first a short introduction to the aim and principles of SEA, describing how the levels of strategic actions can be used to distinguish between different tiers of SEA. Secondly the research and scholarly discussions around the evaluation of SEA effectiveness and power are presented. Finally, the chapter sets the thesis in perspective of the state of the art, and presents the research goals and questions.

3.1 State of the art

The aim of SEA is to endorse protection of the environment and the promotion of sustainable development. The way SEA contribute to environmental protection and sustainable development is by providing an arena to incorporate environmental considerations into strategic decision-making processes, when strategic actions such as policies, plans and programmes are formulated and decided upon. The literature on SEA contains a wealth of guidelines and regulations, which defines SEA (e.g. Christensen et al. 2007, Partidario 2005, Partidario and Clark 2000, Therivel 2004, Therivel et al. 1992). The definitions have different emphases, but in general the characteristics of SEA are: systematic process, early integration, mitigation, public participation and documentation.

Strategic actions in general can be explained as the composition of an objective and related statements on how to implement it. Examples of strategic actions are; economic policies (e.g. privatisation, structural adjustments, trade agreements), legislation (national, regional, local; international treaties), regulations of a single resource (e.g. water management or coastal management) (Therivel and Brown 1999). The concept of strategic actions hence covers a broad variety of initiatives. In the literature on SEA, strategic actions are often used as a joint description of the concepts of policies, plans and programmes. These can be seen as a hierarchy of strategic actions. Policies are the highest strategic level, plans are second and programmes are third, while a project is not considered as a strategic action. The differentiation of the tiers is defined in Table 3.1. Inspired by Wood and Djeddour (1991) a policy is considered as the inspiration and guidance for action, a plan as a set of co-ordinated and timed objectives for the implementation of the policy, and a programme as a set of projects in a particular area (Wood and Djeddour 1991). Strategic actions are usually developed by public agencies, such as land use planning departments or energy planning agencies, but private or semi-private companies like telecommunications or water companies

that have programmes for where to site their infrastructure can also develop them (Therivel 2004).

In relation to the tiers of strategic actions, assessments can similarly be classified as; policy SEA, plan SEA, programme SEA and, on the project level, EIA. The different tiers should not be seen as 'lower' levels regarding the resources needed, as the content and resources necessary for the SEA do not follow the tiers but the individual strategic action in the specific area dealt with by the assessment. The tiers of assessments and the definitions of policies, plans and programmes, and thus the strategic level, can further be related to general tiers of strategic questions raised in the ongoing decision-making process. This leads to specific foci in the assessments which can be illustrated as in Table 3.1. The tiering does not refer to the level of detail or the resources used but only to the strategic level of actions to which the impact assessment relates

Tier	*Definition*	*Main question raised in the IA*	*Focus in the IA*
Policy	Inspiration and guidance for action	Why action?	- Need, objectives and principles of new action
		What actions?	- Selection of best methods and the capacity needed for each method
Plan	Set of co-ordinated and timed objectives for the implementation of the policy	What actions? Where actions?	- Location of alternatives
Programme	Set of projects in a particular area	Where actions? When actions?	- Implementation
Project	Development project	How actions?	- Design of projects

Table 3.1: Tiers of decision-making and the role of SEA (Hansen et al. 2008).

When strategic actions are carried out, the process of getting to the point where the actions are implemented in practice typically includes a great deal of planning, developing and discussing. Strategic actions can start and be inspired in many ways, but they all include some degree of bargaining, horse trading or similar (Therivel 2004).

Kørnøv and Thissen (2000) explained how the ideal of rational decision-making is not accomplished in relation to strategic decision-making, as the decision makers are typically influenced by norms, culture and habits. Political decision makers in reality often have a preferred alternative from the outset of the process, which makes it hard to convince them of other (possibly better) options identified during the process. The ideal decision-making process follows the idea of decisions being made according to rational decision-making principles, based on the assumption that better and more scientifically valid information or

knowledge regarding an issue will contribute to a better and more rational decision (Kørnøv and Thissen 2000). Experience and research has shown that, for several reasons, among others the limits of mental capacity to overview a limited volume of information, this is not the case in reality (Therivel 2004). Still the model for rational decision making forms the base for structuring SEA processes (Therivel 2004).

As the SEA's role is to inform strategic decision-making, the SEA process is supposed to progress simultaneously with a rational decision-making process, feeding information into the different steps. This is illustrated in Figure 3.1.

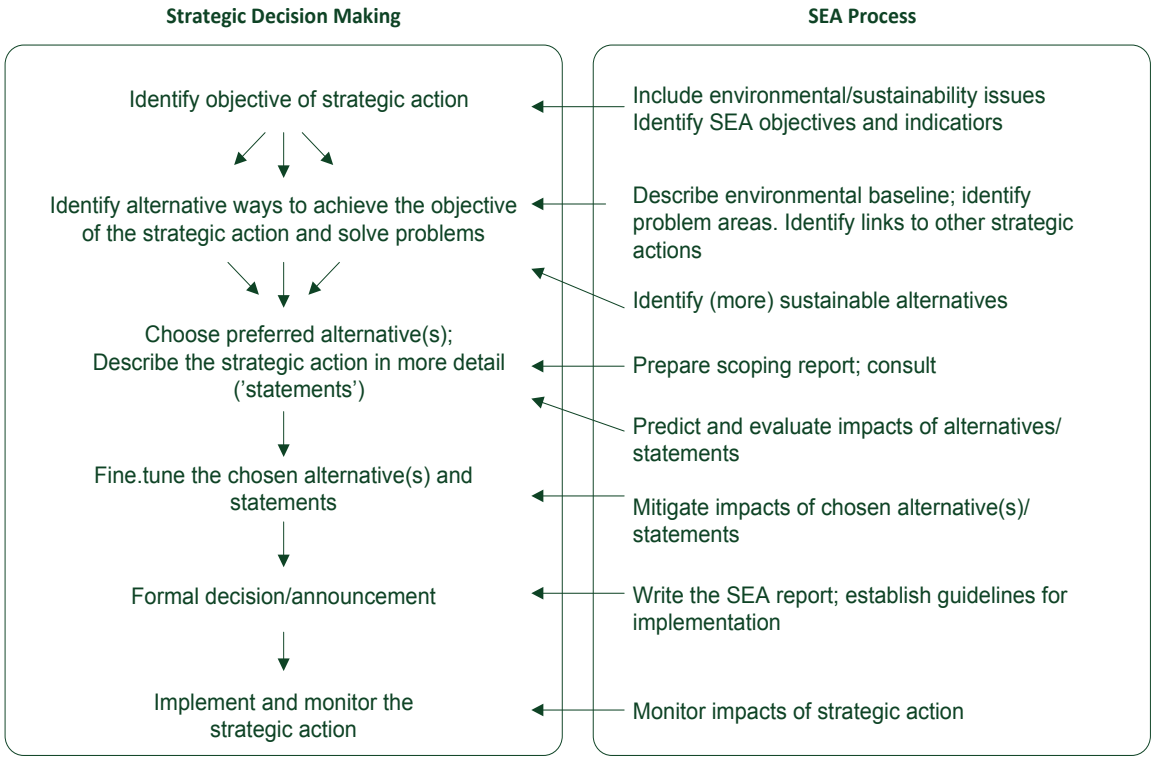

Figure 3.1: Link between SEA (right) and strategic decision-making (left), based on idealised decision-making procedure (Therivel 2004).

The role of SEA to incorporate environmental knowledge into decision-making processes bears the assumption that to contribute to sustainable decision-making, the outcome of the SEA in the form of an environmental report should not only be of the highest quality, but also the SEA should be conducted according to international best practice prescriptions. According to the strategic decision-making model, it should also be producing and offering environmental information to the decision makers during the whole decision-making process (Therivel 2004). However, the critique of the rational decision-making model and the empirical evidence which shows that decision-making is influenced by actors' norms and traditions, among other factors, demonstrates that environmental knowledge is not necessarily included in the decision-making even though it is accessible. There are, in other words, structures other than the formal decision-making frame that influence the outcome of a process and hence the SEA's potential to secure the inclusion of environmental knowledge. This raises the question: What affects the SEA's effectiveness to influence decision-making?

The practice, principles, techniques and application of SEA have been the subject of extensive research. Still the empirical research and evaluation of the effectiveness SEA is limited and often related to the output in form of the environmental report and its implementation (Fisher 2004, Nilsson and Dalkmann 2010, Retief, 2007, Stoeglehner et al. 2009). Yet the concept of effectiveness has developed through both theoretical discussions and available empirical investigations. Direct and indirect outputs of SEA are introduced as approaches to evaluation of SEA effectiveness by Thissen (2000), Sadler (2004) and also Retief (2007). These reflect on how the direct outputs relate to the primary and subsidiary goals of the SEA, such as improving environmental quality and including environmental knowledge in decision-making. The indirect outputs regard changes in attitudes towards the environment, like improved awareness, changes in institutional arrangements and departmental traditions.

Besides direct and indirect environmental effectiveness, Stoeglehner et al. (2009) suggest that democratic effectiveness should also be included in the model, based on the experience that SEA needs to be integrated into the planning and decision-making process to make a difference to that process, and that the political system is crucial for environmental effectiveness. Democratic effectiveness refers to effectiveness when either political decision makers make decisions and choose means that fulfil the political environmental objectives and/or when the administration implements the political decisions, for example, by performing SEA according to certain legislation and guidelines. The effectiveness concept is thus developing and new knowledge is continuously being created. At the annual conference of the International Association for Impact Assessment in Geneva in 2010, a panel of experts including Mat Cashmore from the University of East Anglia and Tuija Hilding-Rydevik from the Swedish EIA Centre discussed the concept, pointing at the need to focus not necessarily on the 'effective*ness*' but rather on the 'effects', as the outcome can vary depending on the context. As SEA in general is one of the only formal tools to regulate policy making, it has a role as a governance critical policy appraisal method (Therivel 2004). Hence the definitions of case specific effectiveness criteria can vary among stakeholders. Different actor groups will often have different interests in the outcome of a SEA and different understandings of what it should be used for (Cashmore et al. 2010). Value neutrality in SEA is therefore not to be seen as a general fact, as SEA provides an arena for power exercise, value exchange and development. This is recognised by several scholars, and recently researchers and practitioners in the field of impact assessment have pointed to the need for inclusion of theories of power in general, to understand and capture the role and function of impact assessment (Richardson 2005). The day to day work of SEA is unavoidably enmeshed in the politics of development, yet precisely how power works in SEA in different contexts, and influences effectiveness, is far from clear. Within the impact assessment field, there have been very few studies based on power theories. This appears to be an important lacuna because, as Cashmore et al. (2010) argue, power dynamics may significantly influence the effectiveness of impact assessment.

To exploit SEA effectiveness and how environmental knowledge is included in decision-making, is important to focus not only on the availability of environmental information but also on whether environmental knowledge is taken into consideration, and how power dynamics influence the arena, and hence the SEA practitioners' capacity to influence the decision-making process.

3.2 Research questions and objectives – and contribution to the SEA research field

As described earlier in this chapter, there is a lack of knowledge and research in the field of SEA regarding the correlation of power and effectiveness. Evaluation of SEA effectiveness can focus on different aspects of the SEA including; evaluation of the consequences of conducting SEA, evaluating the methods and their implementation, evaluation of the outcome in form of the environmental protection or precaution. The links between SEA and the strategic decision-making process are difficult to identify and explain clearly, but crucial to effectiveness of SEA. It is this linkage that is in focus of the research. In this way the thesis contributes to the research field with empirically based knowledge and understanding of the implications of structural power dynamics in relation to SEA's capability to influence strategic decision-making processes.

This thesis further aims to contribute to the research field with investigation and discussion of power and effectiveness in SEA and by developing an approach to the evaluation of SEA effectiveness in decision-making arenas influenced by power dynamics. Furthermore the thesis seeks to create new knowledge and understanding of the function and role of impact assessment in a future Greenlandic context. This can contribute to qualify a future process of developing SEA legislation in Greenland. When developing legislation and guidance for SEA, the contextual conditions are important. Despite similarities in SEA systems worldwide, and thereby possibilities of transferring experience from one system to another, Greenland's particular cultural, political and organisational context must be taken into account when developing a Greenlandic SEA system.

The research of this thesis is based on the challenges Greenland is presently facing with implementation of new mega industries. This includes the lack of environmental protection tools on the strategic level to regulate the implementation of the industries, and the very limited research regarding the context of conducting impact assessment in Greenland, while experts point out the necessity of taking the context specific assumptions into consideration when SEA is implemented. The research aims to capture and broaden understanding of SEA effectiveness to influence strategic decision-making processes and the influence of power. The objective of the research in this thesis is therefore based on empirical studies to:

- Investigate the assumptions related to SEA as a tool in Greenland, to understand and describe the status of and need for SEA in a Greenlandic context.
- Investigate the decision-making process when a location for an aluminium smelter was decided upon and the process of conducting the SEA to be able to identify the characteristics and evaluate the SEA's effectiveness.
- To study the aluminium SEA from a theoretical perspective to understand and find explanations of what makes effectiveness possible and how power can influence the linkage between SEA process and decision-making process.
- Discuss the extent to which identification of power structures can explain the influence of SEA in decision-making.

The investigations and objectives of the research are based on the Greenlandic challenges and the state of the art in SEA research as presented in chapters 2 and 3, with the primary purpose of answering the main research question:

How does SEA become effective in a Greenlandic context?

The main research question is answered by the investigation of the three following sub questions:

- *What is the role and function of impact assessment in Greenland?*
- *When and how was the aluminium SEA effective?*
- *Why did the aluminium SEA influence decision-making?*

The first question regards the general status and need for impact assessment in Greenland.. The question is investigated to identify the context dependent objectives for carrying out impact assessments in Greenland.

The second question regards the case study of the aluminium SEA. To evaluate the direct effectiveness of impact assessment at the strategic level in Greenland, understood as securing the inclusion of environmental knowledge in decision-making and identifying the obstacles and possibilities for the influence of SEA on the strategic decision-making process.

The third question regards the process of conducting SEA. The intention is to explain and discuss how power dynamics in the process where the SEA feeds into the decision-making process impact on the possibility for actors actually to influence both the outcome and structures of a decision-making process.

4. Research strategy and method

This chapter present and discuss the research approach and methodological choices made. It gives an overall picture of the empirical study, while details of the study related to the different investigations carried out are presented in the papers. The empirical focus, the aluminium smelter in Greenland, is a single case study concerning an 'extreme' case, and it is described what it implicates. Thereafter the research approach and role of theories is described and reflected upon. Finally the role of the researcher is discussed and it is described how data, research approach and preliminary results are checked in order to secure good quality.

4.1 A single but extreme case

The empirical study is based upon a single case study of the decision-making process upon the location of an aluminium reduction plant in Greenland. It is an atypical case where the decision can be characterised as a residual and an ad hoc decision affecting organizational space without implications beyond the immediate event (Hansen and Kørnøv 2010). The decision-making in relation to the planning of the Alcoa programme is, in other words, a situation where the organisation of the Government of Greenland lacks policies and therefore reacts to this one event without setting a precedent. The case is also atypical or extreme in the sense that it involves potential irreversibility, while due to the extensive energy requirement the aluminium programme will delay the possibility of similar energy intensive industries in Greenland. The programme would utilise the largest individual hydro potential (Tasersiaq). There are several large unused hydro potentials, in combination easily sufficient for a similar programme, in the area between Nuuk and Paamiut. 'However, the complexity of such a programme and the inferior hydrologic data for these potentials mean that such a programme is less likely in the near future' (Drechsel 2010; Quote from interview translated from Danish by the author). Finally the non-typicality involves a study of the influence of a non-mandatory SEA being carried out for the first time in Greenland (Hansen et al. 2008). These atypical or extreme cases are interesting and, according to Bent Flyvbjerg, '…often reveal more information because they activate more actors and more basic mechanisms in the situation studied' (Flyvbjerg 2006:229).

4.2 Approach and role of theory

Case studies may be divided into: *exploratory*, *descriptive* and *explanatory* case studies (Yin 1993:5) – categories related to the specific purpose of the case study. This research focuses on understanding the role of SEA in decision-making – with an emphasis on answering the questions of *when, how* and *why* SEAs influence decision-making. In that way, the research goal is not to generate or test theory through a case study. The goal is instead to understand the case by means of theory. I seek to explain when, how and why SEA practitioners have influenced decision-making. The research is therefore an explanatory case study – using both inductive and deductive thinking.

By using both an inductive and deductive approach, also named abduction (Langley 1999), I obtain the advantages of both:

> ... the closing of the gap between data and theory can begin at either or both ends (data or theory) and may often iterate between them ... Rigid adherence to purely deductive or purely inductive strategies seems unnecessarily stultifying. (Langley 1999:694)

Using both an inductive and deductive approach, in my view, is both needed and strengthening for the research because of the potential for complex relationships between factors influencing SEA in decision-making and the outcomes of the processes. The exploration of relations from the inductive starting point is not limited to certain theoretical hypotheses.

The inductive approach was dominant in the initial research phases, in which the research investigated the questions of *if* and *how*, while the deductive approach was dominant in the last phase, which focused on explaining why SEA influence. Choices on the two approaches have taken place in the process simultaneously – '…as inspiration guides us' (Langley 1999:708).

Despite the inductive point of departure I will not describe it as pure induction – or as 'a-theoretical'. First of all, as a researcher I will never achieve objectivity, while '... any analysis of a single case is guided by at least some vague theoretical notions and some anecdotal knowledge of other cases' (Lijphardt 1971:691) and acting and deciding is based upon both explicit and implicit knowledge, norms and values. Secondly, the research builds upon a literature review providing an important orientation in the theoretical and empirical research field. Hereby the research avoids 'naive empiricism' and the risk of rediscovering the already known (Alvesson and Sköldberg 1994:72).

The theoretical choice on power theory, and specifically on structuration theory, was initiated by the empirical findings and indications of hypotheses for explaining what factors are relevant for understanding why SEA influences.

The concept of SEA effectiveness can be related to different objectives depending on the context investigated and the focus of the research. This is further described in chapter 3. In the aluminium case in Greenland, the SEA was conducted as a means to secure environmental knowledge in decision-making (Hansen 2010). Effectiveness in this thesis is therefore understood as the fulfilling of this purpose. SEA effectiveness therefore is to be understood as effectiveness in inclusion of environmental knowledge in decision-making. Inclusion of environmental knowledge is understood as the short-term comprehension of environmental information by the actors.

The result of the investigation shows that the SEA was effective, but still the evaluation left me with the question: *Why*? What triggered the effectiveness? I could explain when and how the SEA was effective and base it on criteria fulfilled. Yes, environmental knowledge was both accessible and used to argue the outcome of the decisions made, but what was it that brought the effectiveness? Was it due to the fact that the SEA was carried out according to best practice principles? Or was it because of a 'correctly' conducted process? During the interviews that were conducted as a part of the case study, actors kept bringing up the issue of relations among the actor groups as important to effectiveness. For example, a government official from the Administrative Coordination Group explained:

> If the SEA had not been organisationally connected to the Administrative Coordination Group … then it would probably not have had the same weight in the process. (Jæger 2010; Quote from interview translated from Danish by the author)

Another example of the importance of the relations and communication between the actors to facilitate the SEA was stated by the Director of Greenland Development A/S, a company established to handle the contact between the Government of Greenland and Alcoa. He explained:

> The SEA was a task where Greenland Development did not hold a specific role. It was a process that should be carried out among the related authorities and our most important role, in Greenland Development, was to facilitate this. We had resources in relation to communication, like our webpage, which the SEA working group could use, and we had the opportunity to set up citizens meetings. This way we played a practical role to help the process in getting started until the SEA working group was ready to take that responsibility. (Drechsel 2010; Quote from interview translated from Danish by the author)

I turned to theory to find a theoretical approach which could help me analyse the case and find out why the SEA was effective. The approach was largely inductive, as the data collection and investigation in Hansen (2010) pointed in the direction of power dynamics being present, and I chose to find out what an investigation of structural power dynamics could tell me about the case in order to examine, additionally, if there were indications of a relation between effectiveness and structural power dynamics being present. Identification of the main concepts of power has thus been informed by the empirical investigation.

4.3 Sources of evidence and data collection

Common types of data in case studies are data from documents, archival records, interviews, and direct and participant observations (Flyvbjerg 1988:11, Yin 2003:86). In this study these data sources are used in combination in order to take advantage of their strengths. With a view to triangulation of evidence, interviews serve to verify and supplement the document review in uncovering case activities and decision behaviour. The data sources have been used in different combinations in parts of the study. The different parts and the related sources of evidence are described in the following.

In relation to the clarification of values connected to the role and function of SEA in Greenland I conducted a documentary study of legislation related to the regulation of impact assessments and of impact assessment reports conducted in relation to industrial activities in Greenland. I combined this with statements from impact assessment professionals who filled in a questionnaire regarding values and wants. The data from the questionnaires was organised and analysed by the use of the IT tool SPSS. Finally the professional inputs were supplemented with interviews with individual local people.

To map the decision-making process, which served as a base for the investigation of effectiveness and power structures, I conducted a documentary study of reports and drafts, messages from political spokesmen, meeting minutes, correspondence, and press releases. This was supplemented by interviews with central actors. The document analysis was used to determine the chronology, and thus the backbone of the mapping of decisions in the research.

The documents reviewed were both public and internal materials on the programme from the Government of Greenland, the municipalities of Nuuk, Sisimiut and Maniitsoq, Greenlandic newspapers, and the SEA working group. Some of the documents were confidential. The documents are assembled in a case file for the purpose of documentation. I combined this with data from interviews undertaken as personal semi-structured qualitative interviews with key persons from central actor groups.

The interviews and previous documentary studies again served as a base. Further I carried out observations of planning meetings that took place in the decision-making process concerning the aluminium smelter operation. The observations were made by attending meetings in the governmental administration and physical planning group. The observation covered attendance at an official Administrative Coordination Group meeting on 19 November 2007, and three staff meetings in the Department of Physical Planning. The key actors interviewed were; the chair of the SEA working group, the Director of the Business Department and chair of the Administrative Coordination Group, the Director of Greenland Development, and the Head of the Administrative Coordination Group Secretariat.

Securing quality of evidence

In order to produce the highest quality analysis, I have followed four principles advocated by Yin (2003).

1. To show that the analysis relies on all the relevant evidence, I have used the triangulated research strategy involving the obtainable sources of evidence (documents, interviews, observations etc.)

2. To include major rival interpretations in the analysis, I have interviewed actors with different approaches and interests.

3. To address the most significant aspect of the case I participated in meetings and interviewed actors, both to create my own understanding of what was essential to this case and to gain an impression of the actors' perspectives and identification of what were the significant aspects.

4. Prior knowledge to further the analysis is included in the approach through my prior knowledge of the Greenlandic culture, legislation and networks, which has increased the accessibility to actors, data and interpretations. Added to this is the benefit of speaking the language of Greenland.

The task of quality checking my material was shared by several people concerned in the decision-making process, who took great efforts in this regard. Three of the participating actors; Flemming Drechsel, Director of Greenland Development A/S, Peter Hansen, former Director of the Ministry of Industry and Mineral Resources, and Klaus Georg Hansen, chair of the SEA working group, have read through and commented on draft papers and preliminary results. Further, numerous conversations with different actors and authorities have provided feedback on my investigations and results and hence caused me to adjust my approach and the course of the research undertaken. The persons involved were, among others; Mikkel Myrup, the chair of the NGO Avalak, Finn Lynge, the chair of the NGO Narsaq Earth Charter,

Thomas Mogensen and Jesper Malchow-Knudsen from Greenland Development, Mette Frost, Jane Rusbjerg, Jens Hesselbjerg, Ole Fjordgård Kjær, Johannes Hey and Jakob Mathiasen from the Self Government of Greenland administration.

Another important input which contributed to quality checking the research was provided through consultation of researchers with great knowledge of Greenland. This happened at four seminars on Greenland held at Aalborg University where ongoing research regarding Greenland, including my own, was discussed. This especially contributed to quality checking of the relevance of approach, methods used and analysis.

4.4 The research process and the role of researcher

As a researcher you can approach your research field in different ways. Kørnøv et al. (2010) and Lyhne et al. (2010) describe how it is possible to distinguish between three different modes of knowledge production and three related roles of researchers. The three roles are:

Classic researcher: Knowledge is produced solely by researchers, goals and methods of knowledge production are defined solely by researchers, and knowledge production is independent of practice in terms of economy and information.

Entrepreneur: Knowledge is produced mainly by researchers, goals and methods of knowledge production are defined mainly by practice, and knowledge production is dependent, in terms of economy and information, between researchers and practice.

Change Agent: Knowledge is produced in cooperation between researchers and practice. Goals and methods of knowledge production are based on ongoing negotiation between researchers and practice, and knowledge production is an interdependent relation between researchers and practice.

According to the definition presented, I identify my role as a researcher in relation to this PhD project mainly as a change agent. I did shift between the roles in different parts of my research, though. From time to time I needed to create a distance to practise and take the role of the classic researcher to obtain an individual and critical perspective on the study, without knowledge production being influenced. Still research was primarily conducted in an interdependent relation between myself and the central actors in the case (Flemming Drechsel, Director in Greenland Development; Peter Hansen, Director of The Business Directorate; Christel Lund-Jæger, secretary for the Administrative Coordination Group, and Klaus Georg Hansen, chair of the SEA working group). The course of the research was continuously shaped as a consequence of the interaction. This happened, for example, when the actors responded to preliminary findings. The actors sometimes found that nuances were missing or information was lacking in a description and then gave me access to (sometimes confidential) information or pointed me in the direction of the information I needed to cover the broader or more nuanced perspective.

In the article Kørnøv et al. (2010), which is included in the second block of this thesis, it is underlined that conducting research as a change agent makes it important that 'One needs to know and recognise [one's] own knowledge, values and delimitations – and at the same time recognise others' (Kørnøv et al. 2010:17). This article also describes how the research needs to be personally driven and based on a 'high engagement and clarification of [one's] own values' (Kørnøv et al. 2010:17), In the following I therefore reflect on my role and values in

relation to the research. The focus is on the challenges and benefits I experienced in acting as a change agent.

Expectations from practice and own values

In practice I was employed as a PhD Fellow by Aalborg University (AAU). The employment was based on a contract between AAU and the Government of Greenland. Further, Alcoa Foundation was co-funding the research. The PhD fellowship was organised with an AAU-based professor, Lone Kørnøv, as main supervisor and the head of the department of Physical Planning from the Government of Greenland, Klaus Georg Hansen, as co-supervisor. The contract between AAU and the Government of Greenland emphasised the need for an autonomous researcher, providing critical and independent guidance based on knowledge and understanding of the Greenlandic context (Kørnøv et al. 2010). It was further emphasised that the researcher should work independently and with high validity in relation to the second co-funder, Alcoa Foundation (Kørnøv et al. 2010). There was thus an interest that the researcher should be familiar with Greenland and the context in which the research was conducted, but at the same time the researcher should take an overview, applying a critical and independent view upon the process and effect (Kørnøv et al. 2010).

My personal motivation for applying for this specific research project was not based on a pure scientific interest. It was rather a combination of scientific, personal and normative interest in promoting environmental protection in Greenland. I was born in Denmark but moved to Greenland when I was seven years old and grew up there. Later I took my Masters degree in engineering at Aalborg University in Denmark and then returned to Greenland where I worked for six years in the Municipality of Qaqortoq. As a municipal employee I handled, among other things, communication with Australian mining companies that were conducting exploration in the area, and related service businesses. I found that to secure environmental protection proactively at an early stage in decision-making, a more strategic environmental regulation was required. The research presented in this thesis was hence conducted with a contractual and personal aim to follow critically and to analyse impact assessment and decision-making in relation to the aluminium case. This has implied that I acted and researched close to the ongoing processes, concurrently creating organisational and societal awareness, and change, towards integration of environmental concerns early in decision-making. Interacting with the research field in this way has not been seen as in conflict with the interest of practice.

> In relation to the societal perspective, it has been an unconditioned benefit – supposedly a precondition – for Anne, that she is an integrated part of the Greenlandic society. (Quote from K.G. Hansen in Kørnøv et al., 2010:14)

The objective and aim for the research has been influenced by the continued collaboration and negotiation with central actors within the research field. As a consequence, knowledge has been produced in collaboration between myself as a researcher and the actors involved. The actors continuously fed information into the research, and as described in the previous paragraph, communication between myself and the actors shaped the direction of the research. The information was both communicated formally during participation in meetings, interviews and feedback in writing on preliminary findings, and informally through quick

phone calls to clear up understandings, 'private' conversations between myself and the central actors, and conversations with other actors related to the case through their personal networks. I used this informal communication to check the quality of the research approach, topics and findings. Further the information helped me to identify the central areas in the case and to cover the nuances. In this regard it should be underlined that the actors did not in any way need to accept or approve approaches, topics or findings, but they had the chance to feed into the process and influence both its content and course and they used this opportunity throughout the research process.

One of the challenges I met, acting as a change agent was 'keeping the balance of having a close cooperation and at the same time *retaining the critical approach* of a researcher' as it is described in Kørnøv et al. (2010:12). To handle the challenge it has been important for me that Klaus Georg Hansen, who served as my co-supervisor as well as my contact into the governmental administration, understood the importance of my relations to other the actors in the case, and supported me in not giving 'special treatment' to any and asking critical questions. I made it clear to all the actors to whom I talked both directly in relation to data collection, and also informal conversations that added to my knowledge and understanding of the case, that I respected our conversations as confidential unless other agreements were made. I was also allowed to use confidential documents on assessment practice as the basis for my research. The confidential data was a key source for the research, which includes recommendations for how to improve practice.

Another issue of importance that I noticed during the research was a commitment and ownership from the central actors. The sense of ownership was related to the interest in getting a return for their investment. Both the financial investment and later also the investment of time and effort spend on reading and giving fed back into the research. It was a self-improving effect. If they did not contribute with information and knowledge, then their investment would not 'pay off' as intended. The ownership by and related backing from the collaborating organisation thus strengthened the project, and further the ownership by the government administration gave the output of the research a higher status among related institutions.

4.5 Research design

Based on the research objectives and the approach and focus of the research project, seven papers are selected and included in this thesis to represent the research undertaken. One of the papers concerns the researcher's role and function. The other six papers cover different angles and analysis of the area of research and thus contribute to the investigation of the research questions. In Figure 4.1, the research design based on the six papers is illustrated.

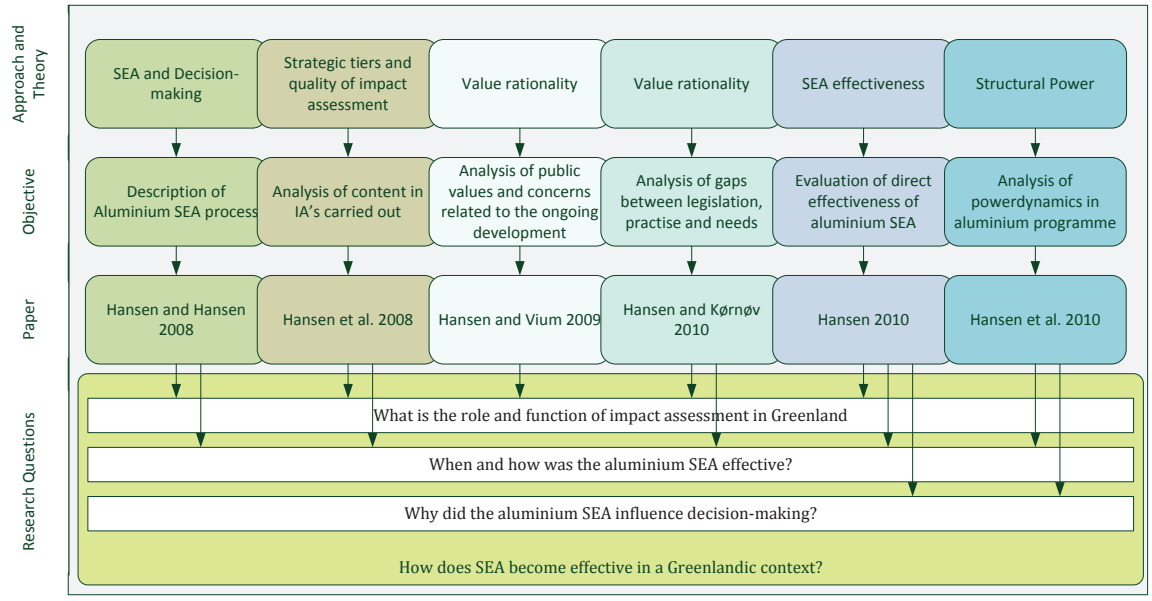

Figure 4.1: Research design developed by the author.

As Figure 4.1 also implies, each paper feeds into discussions related to one or more sub research questions, and the three sub questions all have the purpose of contributing to the answer to the overall question: 'What is the role of SEA in a Greenlandic context?'.

5. Theory of power and structures

In this chapter I will describe how power theory is used to create a frame for interpretation of the empirical results. The reasoning behind the choice of theory and the basic concepts are presented. The purpose of this chapter is to introduce power theory – with an emphasis on the chosen structuration theory by Anthony Giddens. The purpose is further to show how theory is used in the research and how the research design ended up including the theory.

5.1 Why power theory?

The overall reason for choosing power theory as an approach to the research was based on the empirical findings in the case study, which implied that power dynamics influenced the decision-making regarding the localisation of an aluminium smelter. Without knowing what power studies implicated, I gained the impression that power relations was important and influential in the decision-making process, and hence crucial to the study of SEA influence on decision-making, and I decided to find out what power studies could be used for and how.

The philosopher Peter Morris (Morris 2002) developed an overview of the main potentials that power analysis brings and why researchers find power theory interesting. He points to three reasons for studying power. Firstly he concludes that in practical contexts power analyses can be used for identification of the capacities of actors, in order to achieve desired outcomes. Secondly he finds that power analyses in moral contexts can be used to identify whom to hold responsible for outcomes that affect the interests of others. Thirdly he concludes that, in evaluative contexts, when we are judging social systems, power analyses can be used to identify the extent to which the citizens have power to meet their own needs or wants. Morris' reflections relate to power in a general sense of 'capacity to bring about effects'. The three potential outcomes of power studies can contribute to the understanding of the role and function of SEA seen in the aluminium case context. In Table 5.1 the potential investigation outcomes identified by Morris and my interpretation into the context of the aluminium SEA are presented.

In general power research can be used to find:	*In this research it is interpreted as:*
In practical contexts: who holds capacities to achieve desired outcomes?	Do SEA practitioners hold the capacity to influence decision-making?
In moral contexts: who can be held responsible for outcomes that affect the interests of others?	Are SEA practitioners responsible for outcomes of the decision-making process that affect the interests of others?
In evaluative contexts, to what extent do social systems give their citizens freedom from the power of others, and to what extent do citizens have the power to meet their own needs or wants?	To what extent can systems give the SEA practitioners freedom from the power of others, and to what extent do the SEA practitioners have the power to secure inclusion of environmental knowledge in decision making?

Table 5.1: Questions that power research can be used to investigate. The questions in the left column are general and based upon Morris (2002), the questions in the right column are the author's interpretation of the questions in the specific case context of the research.

In this research the focus is on the SEA of aluminium smelter operation in Greenland. If the questions regarding power from Table 5.1 are understood in that context then the questions can be translated as follows: The first question regards power capacity in practical contexts: Who holds capacities to achieve desired outcomes? If the 'who' is replaced by 'SEA' and the 'desired outcome' by SEA is defined as the purpose, namely to influence decision-making, then the question in the context of the case study can be reformulated or translated to the question: 'Do SEA practitioners hold the capacity to secure inclusion of environmental knowledge in decision-making in practice?'. The other two questions can similarly be interpreted into the case context as shown in Table 5.1 and they are both extremely interesting to investigate, but as focus in this research is on the effectiveness of the aluminium SEA, the first question is the one in focus of the research, and which I will use power theory to investigate. The use of power theory in the research is hence on investigating the practical context of the aluminium SEA but also with reflections regarding the evaluative context, namely on whether the structures secured SEA effectiveness.

5.2 The concept of power, an introduction

Power is a concept which is subject to various definitions and there are great differences between the different definitions and research approaches. Power is therefore empirically being researched in various ways dependent on the power concept used and the interpretation of the theories behind. To gain a broader picture of how power can be conceptualised in the study of the aluminium SEA case, the focus in the following is on how the concept of power related to political decision-making has developed since Robert Dahl's explication of 'direct power'.

In the early 1950s studies of power were based on a narrow understanding of the concept as the ability to control directly others' actions, and were investigated by identifying visible conflicts and investigating related domination in conflicting situations (Hansen et al. 2010). Power was conceived individualistically, as that of an agent A over an agent B, and understood as centrally entailing *power over* others, with no focus on explaining why (Thomsen 2005). Power was thus primarily seen as a causal relation between the behaviour of two actors. To investigate this type of power relations, the effect had to be direct, as it involved visible and decisive action. A and B had to be directly connected to each other by A's deliberate attempts to affect B (Dahl 1957:204). Based on this understanding of power, Robert A. Dahl developed a method to investigate who had power in decision-making. The method required that force should be measured by visible and direct attempts to control policy decisions (Dahl 1989, Thomsen 2005). Dahl based the development of his method on definitions presented in his article 'The Concept of Power' from 1957. Dahl sees the concepts of power and influence as synonymous, the notion of power relates to the situation where A can get B to do something B would not otherwise have done (Dahl 1957:202-203, Thomsen 2005:31). This is illustrated in Figure 5.1.

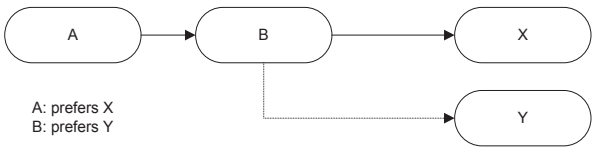

Figure 5.1: Illustration of the concept of direct power, where A can force B to do something B would otherwise not have done (Thomsen 2000:31).

The empiricism and concept of power represented in Dahl's method was subsequently criticised and modified by the political scientists Peter Bachrach and Morton S. Baratz. They believed that the political system of decision-making was not fulfilling the democratic ideal of openness and free access to decision-making for various groups in society (Bachrach and Baratz 1962). From their viewpoint the concept and investigation of direct power in decision-making did not cover essential aspects of power dynamics as they found that power in political arenas was often related to suppression of conflict. They concluded that power is not necessarily related to direct conflict between actors as the exercise of power can also be exercised by the limitation of an actor's opportunity to act or influence (Bachrach and Baratz 1970). Still the focus and assumption, as in Dahl's approach, was that exercise of power was connected to conflicts of interest and deliberate suppression. However, the development of the power concept pointed to a structural feature of power as embodied in institutionalised practices, where these practices operate to benefit some at the expense of others (Gould 2008). Steven Lukes went on to add the notion that power involves an ability to exclude potential issues from political processes by influencing, shaping and determining the perceptions and preferences of others (Lukes 1974). Lukes found that power was frequently exercised by a deliberately constructed consensus. Accordingly, preferences themselves were seen as the outcome of the exercise of power and did not necessarily involve overt conflict at all. Lukes explained:

> ...A may exercise power over B by getting him to do what he does not want to do, but he also exercises power over him by influencing, shaping or determining his very wants. Indeed, is it not the supreme exercise of power to get another or others to have the desires you want them to have – that is, to secure their compliance by controlling their thoughts and desires? (Lukes 1974:23)

He underlined that his understanding of power was an 'agency' concept rather than a structural concept (Lukes 1978). In his first writings about power, the focus was on analysing who held power over others rather than who had power to influence, though he has more recently emphasised this more positive conception (Hayward and Lukes 2008, Gould 2008). Still Lukes' approach to the concept of power could be interpreted as partly structuralistic, as several times he referred to systemic and structurally caused suppression of actors' real interests (Thomsen 2000:31).

> The radical, however, maintains that men's wants may themselves be a product of a system which works against their interests ... (Lukes 1974:34)

Lukes' understanding was very closely related to the structuralistic development of the understanding of power, moving further away from the behavioural understanding of power to the understanding of power as a phenomenon created or influenced by social systems and hence social structures.

A fundamentally different understanding of power was grounded in the late 1970s in discursive analyses. The famous French philosopher and sociologist Michel Foucault was sceptical towards the notion of power as static possession, and found that power should be seen from a much more dynamic perspective. Michel Foucault thus extended the discussion of the concept of power. According to Foucault, the empirical activity of identifying those who possess power and of locating power loses its importance (Foucault 2008). His approach

rejects the belief in the existence of an ordered and regulating rational agency. In Foucault's definitions there are no sources from which actions stem, only an infinite series of practices. Power is thus seen by Foucault not as something you can possess but rather a series of effects caused by political and institutional practices (Thomsen 2005). In a lecture given the 11th of January 1978 Foucault argues that power is not a substance but has to be analyzed in relational terms. He finds that power should rather be seen as a complex phenomenon where more was at stake than just one group's attempt to dominate another. He states:

> Power is not a substance ... power is a series of mechanisms and procedures which has the role, function and theme, to secure power ... (Foucault 2008:7-8)

Simultaneously with the development of the discursive approach to power investigations, the structural concept of power arose. Different from the other power concepts, the structural power was not defined as a purely behavioural phenomenon. The structural power is not an alternative definition of power in relation to the behaviour-based and therefore it does not reject the notion that power characterises a certain type of behaviour. The structural power is an extension of the concept of power with a dimension of power related to the organisational, institutional and structural factors to foster power-oriented behaviour (Thomsen 2005:109-110). The structural power concept was developed based on the recognition of the limitation it brought to power analysis to see power as always related to actors' deliberate attempts to control others (Thomsen 2005:109). The structural approach did not cause a rejection of the understanding that power characterises certain behaviour but rather a specification of institutional and structural parameters carries power-oriented behaviour (Thomsen 2005). The main difference from the former definitions of power was the focus on the interaction between two actors A and B, where one was exercising power to control the other. The structural power approach to power was rather to see it as a structurally distributed capacity to influence – the focus was on 'power to' rather than 'power over'. Power could be exercised in the sense that one actor could influence another actor's capacity to act by changing institutional features.

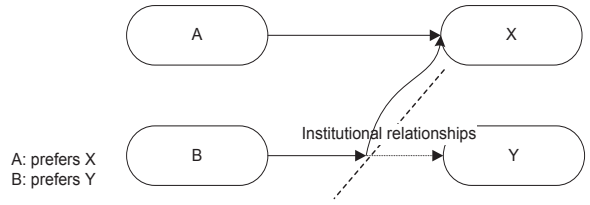

Figure 5.2: Illustration of the concept of institutional power where institutional relationships are constraining and enabling actors influence. Developed from Thomsen (2005).

Talcott Parsons was one of the first to claim that power was not about the deliberate attempt of one actor to suppress another actor but rather was related to the capability to implement collectively binding decisions to secure stability and obedience (Parsons 1987:103, Thomsen 2005). Parsons' definition of power was clearly structural and system-analytical. The power notion was about formal authority to make decisions that secures systems integration and stability and hence the exercise of power relates to the use of resources which supports the implementation, the resources being formal authority and related sanction tools. Parsons' concept was focused on the power of the institutions on the actors, and did not include the possibility of actors being able to act differently than the system prescribes.

An alternative endeavour to develop a structural power concept was represented by the British sociologist Anthony Giddens, who developed on Parsons' power notion. Giddens explained:

> Talcott Parsons has with good reason attacked the zero-sum conception of power, substituting for it the idea, that power is both generative and distributive. Although I am less than happy with some aspects of Parsons's own formulation of the notion of power, the gist of this view is, in my opinion, correct. (Giddens 1985:172)

What is generally different in Anthony Giddens' approach compared with Parsons' is the view of the role and function of actors. Where Parsons only focused on the influence of institutional structures on actors, Giddens also included actors' influence on structures. Giddens described actors as knowledgeable individuals or groups who could at all times change existing conditions or the outcome of development processes. Besides the interest in developing Parsons' power definition, Giddens also developed his approach as a continuation and a critique of Foucault's research. Giddens constructed an inclusive social theory which he called *structuration* or *duality of structure*. On this view, power should be seen as an important component of social structures in general. These are the basic principles in the Structuration Theory, which I will present in a broader perspective in section 5.4.

Giddens agrees to the idea of an actor being able to constrain another actor by influencing structure, but he does not see is as necessarily deliberate, and at the same time the other actor would react back and there would ensue a negotiation where the actor who possessed the most resources would gained most influence and hence the most power. Hereby Giddens underlines that power is considered as equal to influence (Giddens 1984).

Giddens found that to cause changes actors must possess relevant resources. Power, according to Giddens, was interlinked with agency, as power was defined as actors' capacity to influence development processes, also described as transformative capacity (Giddens 1984). Giddens' approach placed him between two strong power-traditions, as illustrated in Figure 5.3. The individualistic approach concerns how actor A influences actor B (Bachrach and Barach, Lukes, Dahl) and a collective or institutional approach, where power is seen as an institutional phenomenon and actors' capability to change their environment is ignored or their power is fully determined by the institutions (Arendt, Parsons, Poulantzas). The 'structuralistic understanding' in Figure 5.3, is further described in paragraph 5.4 regarding the structuration theory.

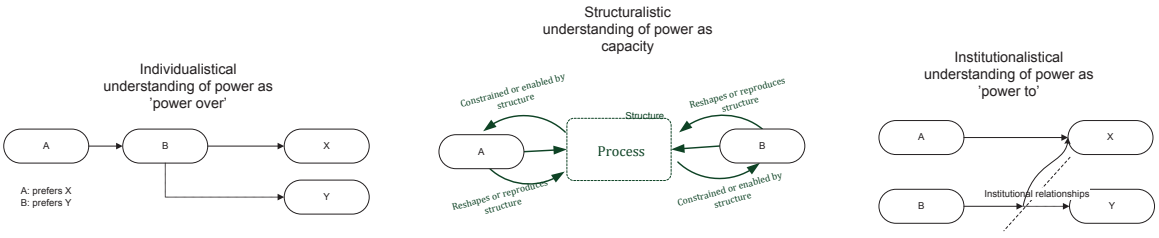

Figure 5.3: Illustration of three traditions of conceptualisation of power. The figure is developed from Thomsen (2005) and Figure 5.5 in this thesis

5.3 Why structuration as the research approach in this study?

Empirical results in the initial investigations indicated that influence on the decision-making process was due to actors' internal interaction and communication which developed during the process. This is in line with Giddens' insistence on actors' potential to reflect and act deliberately to make a difference (Giddens 1985, Hansen et al. 2010). Giddens' structuration theory holds that actors possess the opportunity to use accessible resources and thereby to influence societal development processes (Giddens 1984). He thereby emphasises that actors hold power in the form of 'transformative capacity' and hence the power to influence development processes through existing structures or by changing/reshaping the structures and the outcome of development processes (Hansen et al. 2010). The theory thus can not only be used to explain how actors are constrained by power but also whether they hold the capacity to influence a development process, which in this case equals decision-making process (Hansen et al. 2010).

The theory is chosen to investigate actors' use of power and access to influence on a decision-making process. The Structuration Theory is a useful departure point for investigating the SEA working group's capacity to influence decision-making in the aluminium case and thereby evaluate if the group's members have power to secure inclusion of environmental knowledge in decision-making. The theory is used both to provide an explanatory content and as an approach to investigate what enables or constrains actors' access to influence over decision-making (Hansen et al. 2010).

5.4 Structuration and agency

Anthony Giddens' Structuration Theory (ST) holds that social structures make social action possible, and at the same time that social action creates and/or sustains those very structures (Giddens 1984). This is illustrated in Figure 5.4. Action and structure should therefore be understood as a duality rather than two separate entities. Thus decisions are the product of neither structure nor actors alone, but of both: 'man actively shapes the world he lives in at the same time as it shapes him' (Giddens 1984). It is then both a theory about how actors are influenced by structures and a theory about how structures are formed by actors (Hansen et al. 2010).

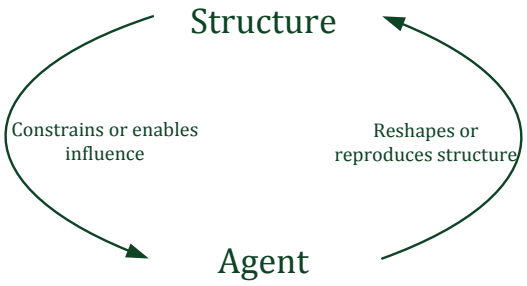

Figure 5.4: Principle of structuration. Developed from Giddens (1984).

Structures are characterised by absence of human action and are understood as sets of rules and resources in society upon which actors draw in the production and reproduction of social life (and hence the structure). Giddens defines resources as:

> …structured properties of social systems, drawn on and reproduced by knowledgeable agent in the course of interaction. (Giddens 1984:15)

He distinguishes between two kinds of structures: either material allocative (generating command over objects, goods or material phenomena), or authorative (generating command over persons or actors). Governments are procedural regulations, which may be formal (written) or informal (rules and norms) (Giddens 1984:31-33). The notion of resources is a key one within ST, and in the study of structuration and power (Hansen et al. 2010). However, what resources mean, more explicitly, remains unclear in Giddens' work (Hansen et al. 2010).

Informed by the empirical indications, the relation between resource and power will be discussed in paragraph 5.6, and I will define the resource in focus in this study. One of the main propositions of ST, according to Giddens, is that:

> … the rules and resources drawn upon in the production and reproduction of social action are at the same time the means of system reproduction (the duality of structure). (Giddens 1984:19)

ST is based on the assumption that human actors are both knowledgeable and capable individuals called agents (Giddens 1984). When agents act, they are seen as acting within limits that are set, in part, by the actions of other agents. At the same time they act in contexts that are structured by rules – social boundaries to action. They are never powerless or victims of social forces out of their control. Social actors have the ability, and thus the possibility, to make a difference in the social world where they can exercise power. As actors are capable of expressing and explaining an action and the purpose of it (reflexivity), it also raises the possibility of influencing processes, based on the actors' interest and willingness to do so, and the capacity in the form of the resources they hold. Actors therefore possess what Giddens calls transformative capacity (Giddens 1984).

As mentioned earlier in this chapter, and illustrated in Figure 5.4, it is possible for actors to influence structures. Structures are sets of rules and resources, and Giddens specifies that the transformative capacity of actors is primarily related to the resources they possess (Giddens 1984). The actors are dependent upon the resources to which they have access in an arena where more actors are present and work for their different interests. They use the resources they possess to gain influence (Hansen et al. 2010). Actors are seen as having unequal access to resources and are favoured differently by the structures in the form of rules related to the distribution of resources. Therefore there are different (and unequal) conditions and opportunities for different actors to exert influence when decisions are made.

The influence an actor has on a given process is dependent on how the structures influence the actor, but at the same the actor can change the structure by the use of resources. Actors can hence act in two different ways to reproduce structures and in two different ways that will reshape structures, depending on whether the structure constrains or enables the actor in a specific context. This is illustrated in Table 5.2. The theory can be a challenge to apply to

empiry because constraint by structures can be in the form of rules that cause unequal distribution of resources among actors. It would be reasonable to ask: How can an actor influence a structure that is hindering access to a resource that the actor needs to hold to influence the structure? Giddens answers this with reference to actors' other resources (Giddens 1984), resources that are not constrained by the structure or the process that is being reshaped.

Rule enables action by giving an actor access to a resource	*Rule constrains action by not giving an actor access to a resource*	*Influence on structure*
Actor uses resource to influence	Actor does not act	Actor reproduces structure
Actor does not use resource to influence	Actor uses resources to act even though constrained by structure	Actor reshapes structure

Table 5.2: Actors' possible actions constrained or enabled by structure and what it means for the related influence back on structure. Developed from Giddens (1984).

5.5 Power as transformative capacity

ST includes the premise that power dynamics are present in development processes at all times as a result of participating actors with their individual interests in relation to outcome. Actors are seen as knowledgeable individuals or groups. Actors can have different interests in promoting certain outcomes of development processes. Actions will thus involve intentions by actors to secure the outcome according to their particular interests. Actors to secure an outcome in this regard exercise power by the use of resources as means. Therefore, according to the theory, resources are, 'the media through which power is exercised' (Giddens 1979:131). Further Giddens emphasises that power within social systems which enjoy some continuity over time and space presume regularised relations of autonomy and dependence between actors or collectivities in the context of social interaction. 'Power relations within social systems can be regarded as relations of autonomy and dependence' (Giddens and Dallmayr 1982:199).

ST holds that 'power is actors' capability of achieving outcomes' (Giddens 1985:172). Human agents may be limited in their options, but there is always potential for them to activate resources to influence and change the situation whereby they may increase their influence:

> Power is never merely a constraint but is at the very origin of the capabilities of agents to bring about intended outcomes of action. (Giddens 1984:173)

Power is hence about actors' influence on processes to achieve a certain outcome. Giddens does not explicate the notion of process or outcome and does not equalize structuration and power. Therefore I find that Giddens does not refer only to the outcome of structuration

when he talks about the exercise of power. I rather interpret Giddens and ST as viewing structuration and hence social production or reproduction as superior to the exercise of power. Structures are the frames that influence, enable or constrain actors in development processes where power is exercised by actors by the use of resources. Actors will then during the process either reproduce or reshape the structures which influence the process.

As an example, I understand planning of a new industry in Greenland as a development process. The structures are the frames under which the process is going on, and as structuration is a phenomenon happening at all times, actors will either reproduce or reshape structures like norms (e.g. organisation of the group of government officials to administrate the project) and traditions (e.g. who talks to whom, and how), while actors seek to influence the outcome of decision processes (e.g. concerning whether or not aluminium smelter operation should be implemented, where to place an aluminium smelter, and which ownership model to implement).

Giddens emphasises that actors' use of power in a decision-making process does not necessarily bring that the objective of an actor is obtained or the process is influenced. Power dynamics are the use of resources in order to achieve a desired outcome. Influence can still be achieved by the use power if resources are unequally distributed and actors who hold the greater transformative capacity dominate the other actors. If the actors who hold greater transformative capacity have no interest in influencing the decision outcome, for example, because they are more interested in influencing the structure, then structures in the decision-making process can be changed and influence the transformative capacity of other actors. The complexity of multiple actors' influence on processes influences both the process and the other actors' capability to influence. This is illustrated in Figure 5.5.

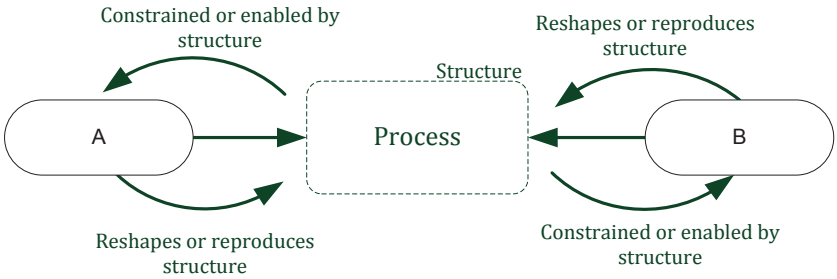

Figure 5.5: Illustration of ST and the complexity of multiple actors' influence on structures, in relation to processes, where the actors' actions influence both the process and the structure, and thereby other actors' capability to influence the outcome of a process. The figure is developed by the author, based on ST and Giddens (1984), with emphasis on operationalising the theory for empirical research.

When actors influence decision-making by using their superiority in a transformative capacity to achieve the outcome they desire, they are dominating other actors' access to influence. Capacity and hence possibility to dominate others can be given by structures or be achieved by use of power either to influence directly or to change the structure to gain influence (Giddens 1984).

Power can hence be used either to achieve a desired outcome or to transform the structures.

Focusing on the actors' influence on the decision-making process, I cover just one side of Figure 5.5. Another approach could have been to investigate how structures enable or constrain actors, but as the purpose of the investigation is to contribute to the understanding of why SEA practitioners influence decision-making, emphasis is put on the actors' capacity to influence. My interpretation of ST and the related structural power concept can be used to designate the linkage between the decision-making process and the SEA process. This means that the research covers two types of influence by actors on decision-making:

1) The influence on structures by the use of agency as they are reshaped or reproduced by actors.
2) The influence on the outcome of decision-making by the exercise of power.

The influence on structures and outcomes can in principle happen simultaneously or independently. This depends on the actions of the actors, and actors can decide to focus on changing or preserving an existing structure or on the outcome of the process, or both. It is expected that this will also happen in practice while actors will try to influence the outcome of decision-making if they have an interest in a certain outcome. As structures are both enabling and constraining, actors can use the structures to gain influence or they can reshape them to gain influence. There can also be actors who do not influence outcome or change structures, if they do not have a particular interest in either. Alternatively, actors can have a greater interest in changing the structure than influencing the outcome. An example of this taken from the case study is when the Ministry of Industry and Mineral Resources did not use its access to formulate the decision-making support report. The Ministry changed the structure of the process by not using its access and did not exercise power even though it had the opportunity. That was probably because its primary interest was that the process should happen in an acceptable manner, so that the outcome would be accepted and used by the politicians. The Ministry had an interest in environmental issues being included uncensored, to secure public and political acceptance of the process. By acting differently from the prescription of the formal structure, that was what it gained.

Therefore, four different possible combinations for power and structuration in decision-making can be identified. These are illustrated in Table 5.3.

	Structure enables certain action	*Structure constrains certain action*
Actor influences the outcome	Actor uses capacity to influence the outcome of the process	Actor uses capacity to influence process even though constrained
Actor does not influence the outcome	Actor does not use capacity to influence the outcome of a process	Actor does not use capacity to influence the outcome of the process

Table 5.3: Actors' possible actions constrained or enabled by structure and what it means for the related capacity to influence development processes and hence exercise power. Developed from Giddens (1984).

In the following paragraph I will develop further on the content of Table 5.3, to design a theoretical approach for the research of the process of the aluminium SEA.

5.6 Theoretical frame for investigating the influence of SEA on decision-making

Based on Anthony Giddens' definitions of structuration, agency and power, which are inherently interlinked, the following understanding and conceptualisation is developed for the research.

According to the ST approach, actors are defined as individuals with the capability to decide how and when to act. An actor can at any time chose not to act according to existing structures. By their actions they either repeat – and thus reproduce – structures, or they change and hence reshape structures. In the case study, the actors studied are the different actor-groups participating in the decision-making process regarding a location for the aluminium smelter. In the context of the case, ST thus means that the actor groups in the decision-making process regarding the location of the aluminium smelter could at all times influence the frame for the decision-making process by acting differently from what was formally intended.

Structures in general are seen in the research as formalised rules and procedures for actions within the decision-making process. As power is related to the use of structures in the form of resources, it becomes necessary to investigate the formal rules for the distribution and the use of a resource that brings the possibility of influencing the outcome of decision-making to be able to study the dynamics in relation to both structuration and power.

The concept of power in ST holds that power is the actors' transformative capacity, also explained as their capacity to influence development processes and to achieve a desired outcome by their use of structural resources. Therefore, based on ST and the related assumptions presented in Table 5.3, the possible influence on decision-making can be scheduled as illustrated in Table 5.4.

Situation	*Structuration*	*Influence on decision-making*
The SEA working group influences decision-making outcome and structure	Structure is reshaped	Decision-making outcome is influenced and decision-making process is changed
The SEA working group influences decision-making outcome but not the structure	Structure is reproduced	Decision-making outcome is influenced
The SEA working group does not influence decision-making or structure	Structure is reproduced	No influence
The SEA working group does not influence decision-making but influences structure	Structure is reshaped	Decision-making process is changed

Table 5.4: First step in the development of a power analysis frame for the case study. Assumptions related to the different situations in which the SEA working group can occur and the linked conclusions. The figure is based on Figure 5.3 related to the case study.

The notion of power is closely interlinked with the concept of effectiveness used in the research, namely inclusion of environmental knowledge in decision-making. As the purpose of the SEA was to contribute to informed decision-making by inclusion of information, this is considered the desired outcome, as also mentioned in paragraph 5.1. The power concept of ST offers a lens to study how information sharing – or more precisely communication as a structural resource – was used to influence the decision-making outcome during the process and hence exercise power. Communication is what ST describes as an 'authoritative resource', which can be explained as 'a non-material resource involved in the generation of power' (Giddens 1984:373). The main definitions and assumptions in the investigation of power dynamics in the case are based on the theory as follows:

The actor in focus of the investigation is the SEA working group.

The two structures investigated are *communication* and *decision-making competence*. The communication structure is determined by (1) the access to communication as a resource and (2) the formal communication lines are the rules that distribute the formal access to communication. Change of structure is thereby determined as communication which does not follow the structure. This is interpreted as communication with others than those with whom one is supposed to communicate, or not communicating with those one is supposed to communicate with. It could also be relevant to investigate if communication happens at other

times than supposed, but as there are no official formal requirements for when communication is supposed to happen in the case, this is not included in the study. It could be investigated whether the central actors can describe a general expectation of when communication was supposed to happen based on norms and traditions, but as mentioned above, this is not included in this study.

The second structure in focus is access to influence on decision-making by formal competence to take and thereby determine the outcome of decisions. Inclusion of environmental knowledge can happen due to formal decision-making competence or as a consequence of the SEA working group influencing the structures to gain decision-making competence.

The influence on the outcome of decision-making is understood as the inclusion of environmental knowledge and hence the actor exercises power.

The potential influence of SEA practitioners (the working group) on decision-making is therefore twofold. Firstly actors can possess the capacity to secure inclusion of environmental knowledge in the decision-making by the use of communication as a resource and/or they can by their actions change or reproduce the communication structure that frames the process. The research is hence focused on one actor, namely the SEA working group, and on the other actors' influence on the structure and outcome, thereby leaving out the part regarding the structural influence on the actor.

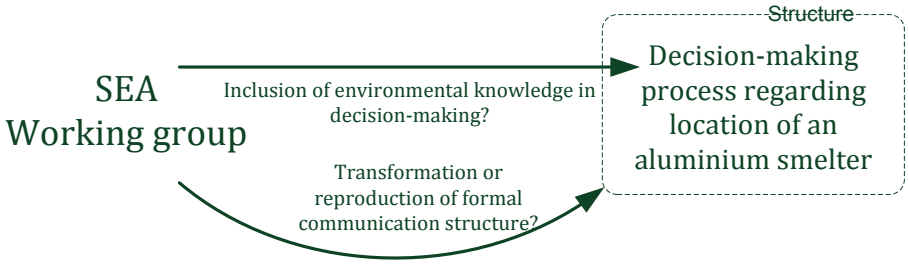

Figure 5.6: Delimitation of area of investigation in power analysis. The area in focus is illustrated inspired by Figure 5.5.

An overview of the definitions and assumptions is presented in Table 5.5.

Effectiveness		*Communication*		*Influence*
If environmental knowledge is accessible and used to argue the outcome of the decision-making process	&	If communication does not follow formal structure	→	Then the SEA working group influences decision-making outcome and structure
If environmental knowledge is accessible and used to argue the outcome of the decision-making process	&	If communication follows formal structure	→	Then the SEA working group influences decision-making outcome but not the structure
If environmental knowledge is not accessible and/or not used to argue the outcome of the decision-making process	&	If communication follows formal structure	→	Then the SEA working group does not influence decision-making or structure
If environmental knowledge is not accessible and/or not used to argue the outcome of the decision-making process	&	If formal communication structure is not used	→	Then the SEA working group does not influence decision-making but does influence structure

Table 5.5: Second step in the development of a power analysis frame. Identification of decision-making characteristics related to the four different situations for the SEA working group, based on the choice of communication as structure to be investigated and inclusion of environmental knowledge as desired outcome. Developed from Giddens (1984).

As described in paragraph 3.1, 'State of the Art', SEA has the purpose of feeding into decision-making continuously during a decision-making process. Therefore it is chosen to identify the key decision arenas in the decision-making process, where the course was changed by reduction of the number of alternatives or by recommending alternatives regarding the location of the aluminium smelter. Each key decision arena is investigated with focus on the influence of the SEA working group on the outcome of this arena and on the structure. The third step of the development of a frame for investigating SEA influence on the decision-making process is hence identifying the situations presented in Tables 5.5 and 5.6 for each decision arena. This is done by mapping the communication structure and investigating whether environmental knowledge was included in the decision-making for each of the key decision arenas. The frame for investigating power dynamics in the key decision arenas is presented in Table 5.6.

The analyses of the key decision arenas collected can form a picture of the power dynamics in the decision-making process and can be used to answer the question: Does the process of conducting a SEA in itself bring the SEA working group the capacity to secure inclusion of environmental knowledge in decision-making in a practical context?

Another important issue to cover is the formal versus the informal decision-making competence. If the formal decision-making competence is influenced, then the structure in the decision-making is changed.

	Yes, environmental knowledge is included in decision-making	*No, environmental knowledge is not included in decision-making*
Decision-making and/or communication happens according to formal structure	The SEA working group influences the decision-making arena: The frame for the decision-making process is not influenced, but the outcome of the decision is influenced. Structure is reproduced Power is exercised	The SEA working group does not influence the decision-making arena: The frame for the decision-making process is not influenced, and the outcome of the decision is not influenced. Structure is reproduced Power is not exercised
Informal decision-making and/or communication is happening	The SEA working group influences the decision-making arena: Decision-making outcome is influenced and decision-making process is changed Structure is reshaped Power is exercised	The SEA working group influences the decision-making arena: The frame for the decision-making process is influenced, but the outcome of the decision is not influenced. Structure is reproduced Power is exercised

Table 5.6: Research frame for investigation of SEA effectiveness and influence in decision-making arenas. Developed from Giddens (1984).

Based on Table 5.6 the main questions to raise and investigate in the research on the influence of SEA on decision-making are the following:

- Is environmental knowledge included?
- Is communication carried out according to the formal structure?
- Is the decision made by actors with formal decision-making competence?

6. Presentation of the case study: SEA and aluminium production

The research centres on the case of a proposed aluminium smelter and the purpose of this chapter is to present the information which forms a base for the research undertaken and hence the understanding of the results regarding the case, which are presented in chapter 7 'Synthesis'. The information is identified during the elaboration of the articles and references are therefore given to these. The main data source has been interviews with central actors combined with my own observations and documentary studies, as explained in section 4.3. First the content of the planned industry is presented with key figures and numbers, then the decision-making process regarding the location of the industry is introduced with focus on the timeframe and actors involved. Finally the SEA is presented with focus on the strategic level of the assessment undertaken and the content of the environmental report.

6.1 Content of the programme for an aluminium smelter operation

The aluminium producing company Alcoa and the Government of Greenland are contemplating the construction of an aluminium smelter, which is planned to begin operating in 2015 (Greenland Development 2009). The aluminium smelter operation, if implemented, will be the largest industrial programme in Greenland to date. Implementation of the aluminium production includes besides the aluminium smelter, construction of hydropower dams, roads, a harbour, dwellings and service facilities for workers during construction and subsequent operation (Greenland Government 2010).

Production of aluminium can be divided into three main stages: (1) Bauxite mining, (2) Production of alumina, and (3) Aluminium smelting (Schmidt and Thrane 2009). It is only the third stage, the smelting, which Alcoa is planning to perform in Greenland (Greenland Development 2009). Aluminium smelting is obtained by a chemical process, as alumina is made up of aluminium and oxygen and these two elements need to be separated to make the aluminium metal. Alumina is dissolved in an electrolytic bath of molten cryolite within a large carbon- or graphite-lined steel furnace. There are usually hundreds of these 'pots' at an aluminium smelter (Alcoa 2010). A high electric current is passed through the pots at a low voltage. The electricity enables the alumina to split into aluminium and oxygen. The electricity maintains the temperature of the process at about 950 degrees Celsius (Alcoa 2010). Smelting of aluminium is a very energy-intensive activity, which is both costly and in a global context requires a low-CO_2 emitting energy supply. The reason why aluminium production in Greenland is interesting from an economic perspective is due to the large unused hydropower potential which could supply the production. The hydropower potential in Greenland is the main reason for Alcoa's interest in placing an aluminium smelter there (Drechsel 2010).

Smelter	*400,000 t/a*
Energy supplied to smelter	650 MW
Employees at smelter	600
Employees at hydroelectric power station	50
Total expected no. of employees when project is in operation	1100–1200
Max. no. of persons (peak) in construction phase	2600

Table 6.1: Key figures regarding aluminium smelter (Greenland Development 2010).

A so-called 'Memorandum of Understanding' (MoU) was drafted between Alcoa and the Government of Greenland. The MoU is the cornerstone of the planning regarding potential aluminium smelter. In the MoU the parties agreed to evaluate, study and address certain issues and concerns in three phases (Greenland Home Rule 2007b). The research undertaken is regarding one of the main activities in the first phase of the MoU, which regards the decision-making on a location for the aluminium smelter.

6.2 Central actors

Based on minutes of meetings, the actors who participated in the first phase of the planning of the aluminium smelter operation are identified. Further the actors' formal roles and tasks are identified through the contract with Greenland Development, the terms of reference for the SEA working group, a statement from the Cabinet regarding the role and function of Administrative Coordination Group and the MoU document.

Administrative Coordination Group:	*Administrator*	*Should manage the process (Greenland Home Rule 2007c).*
SEA working group:	Producer of information	Should secure that a proper SEA was carried out as decision support for the political decision makers (Greenland Home Rule 2007d).
Greenland Development:	Negotiation Unit and 'key account manager'	Should discharge negotiations between Alcoa and the Government of Greenland and collect data for the decision support material (Greenland Home Rule 2007e).
Cabinet:	Authority	Should formulate a proposal for a decision on location and inform the Parliament.
Alcoa:	Applicant	Should conduct technical investigations and economical feasibility studies (Greenland Home Rule 2007b).
Parliament:	Formal Decision Maker	Should decide on a site for the aluminium smelter.
Business Directorate:	Planning secretariat	Should meet and respond to demands from the Administrative Coordination Group and The Cabinet.

Table 6.2: Actors and their roles and functions in the decision-making process.

An organisation diagram for the actors in the first phase of the planning process of the aluminium smelter is illustrated in Figure 6.1.

The Administrative Coordination Group was responsible for the economic administration of the project (Jæger 2010). The Business Directorate was appointed to function as the secretariat for the Administrative Coordination Group. The members of the Administrative Coordination Group were appointed from the very top of the organisational hierarchy within the Government's administration and included directors from the departments of economy, environment, business, infrastructure and housing, minerals and petroleum. The Director of the Business Directorate functioned in this phase also as the chair of the Administrative Coordination Group, and the general administration of the aluminium smelter was simultaneously located in the Business Directorate. Furthermore selected employees from Greenland Development were associated to the Administrative Coordination Group as scrutineers (Hansen and Hansen 2008) The objective of the Administrative Coordination Group was, according to the Director of the Business Directorate who was also chairing the Administrative Coordination Group:

> … to investigate some more closely defined issues regarding the MoU in separate phases to avoid more money being spent than necessary, before it was clear if the project was implementable or not. (P. Hansen 2010; Quote from interview translated from Danish by the author)

Furthermore, a company, Greenland Development A/S, was established in 2006, first as an affiliate of the Greenland Tourism and Business Council, but since the summer of 2007 placed

directly under the Cabinet, to handle the communication and negotiations between Alcoa and the Cabinet. There were different reasons for placing Greenland Development close to the Cabinet. Initially the reason for establishing a company instead of a negotiation unit within the administration of the Government was in the interests of handling information discretely, so Alcoa would not risk public accessibility of confidential information (P. Hansen 2010). The confidentiality enjoyed by potential mining investors in their relation to the Bureau of Minerals and Petroleum in Greenland could not be directly copied to this project, as this protection in relation to minerals investors was stipulated in the Danish Minerals Act – now the Greenland Minerals Act. Later, the protection of confidentiality has been set up as a contract between Alcoa and the Cabinet in the MOU. Still there were other reasons for keeping this structure, among others because of difficulties of recruiting the necessary competencies to the Business Directorate. There was also a risk that the project might draw too much focus and personnel from other administrative tasks within the directorate – or conversely – that the daily operational needs would draw necessary resources from the developing project. Since the project's inception it has been taken for granted that it should be possible to close down the project with relative ease and limited additional expense if need be; for instance, if the hydropower proved insufficient, if there were indisputable environmental showstoppers, or if Alcoa were to pull out (Drechsel 2010):

> I tell every new employee that they should not expect to grow old in Greenland Development – we have short-term office leases, and the only fixed asset the company has on our books is our photocopier. Thus, if the government should at any point decide that Greenland Development shall not carry out our tasks anymore, our organisation can be easily dismantled. (Drechsel 2010; Quote from interview, translated from Danish by the author)

Besides upholding the communication and negotiation with Alcoa, Greenland Development was also given the task of collecting information, and passing it on to the Administrative Coordination Group, from both Alcoa and from external consultants, regarding technical, economical and social aspects of the project (GD Service contract, 2006, Drechsel 2010). According to the Director of Greenland Development A/S, the main task for the company was to 'secure a smooth negotiation process with Alcoa towards an implementation of the project'. He further explains:

> Large and modern foreign companies like Alcoa are used to communicating and negotiating with local authorities. What they really need is a local contact that can point them in the right direction and create a contact with the people they need to talk to and have an overview of the approvals it is necessary to gain in order to implement the project. That is the function we have in Greenland Development. You could call us key account managers. We have a service to sell. We want to sell an investment opportunity in our country, but not at any price. In order to succeed, any project must offer a competitive return on investment, and the host country must provide an investment-friendly environment. However, it is a clear obligation for us to help ensure, that through regulation, taxation and an adaptable workforce, the project must also bring substantial long term advantages for our country. (Drechsel 2010; Quote from interview, translated from Danish by the author).

The Board of Greenland Development A/S was largely composed of government officials. In the period analysed the company had a board consisting of five members: the Director of the National Power Authority, the Permanent Secretary of the Ministry of Industry, the Permanent Secretary of the Premier's Office, the Director of the Environmental Agency and Choef Financial Officer, and the Vice President of Tele Greenland.

Thus, there has always been a very close link between GD, the Administrative Coordination Group, the Business Directorate and the Cabinet.

There was no legal requirement for the Cabinet to include the Parliament in the site selection process. However, the Cabinet (both the former and the present ones) argued that, due to the scale and permanence of these decisions, they should be made by the Parliament, and with the greatest possible inclusion and consensus amongst the parties. Thus the Cabinet chose to delegate authority to the Parliament (Drechsel 2010, Jæger 2010).

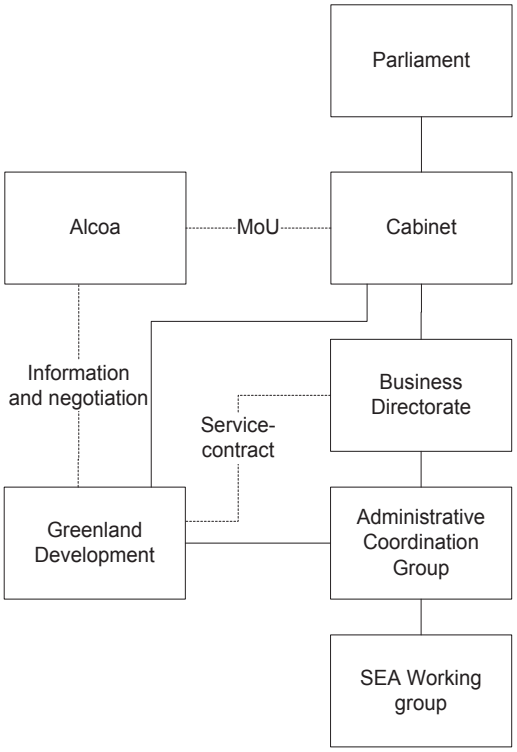

Figure 6.1; Organisational structure of the actors in the first phase of the MoU (Hansen 2010).

When the MoU was signed in May 2007, the Administrative Coordination Group decided to set up an SEA working group to coordinate the SEA process. Two other working groups were simultaneously established regarding socio-economic matters and labour relations. Unlike the SEA working group these were set up within institutions in the form of actors on the scene, namely Greenland Development and the Business Directorate (Jæger 2010, Drechsel 2010). The SEA working group was set up as a working group under the Administrative Coordination Group and was cross-departmental. As chair for the SEA working group, the Administrative Coordination Group appointed the head of the Department of Physical

Planning, which is positioned within the Department of Environment and Nature. The SEA was organised to be placed externally, and not in other institutions related to the planning of the aluminium smelter, based on recommendations from Professor Lone Kørnøv of Aalborg University, who was guiding the authorities, and also on the assumption that a more independent working group was necessary to avoid conflicts of interest regarding environmental and economical issues (Drechsel 2010, KG Hansen 2010, P Hansen 2010). The SEA working group was set up across the relevant directorates, and a budget of approximately 1.5 million US$ was approved. The SEA chairman was affiliated to the Administrative Coordination Group for cases that were directly related to the SEA process (KG Hansen 2010, P Hansen 2010, SEA 2007). The chair of the Administrative Coordination Group explains why the environmental assessment was not integrated into one of the other related institutions:

> The environmental responsibility was anchored within the environmental directorate for the SEA working group to take care of the coordination. It was our opinion that it had to live its own life, to make sure that everybody could see that the environmental interests were not suppressed. We could say to the politicians and the public that somebody had it as their main task to secure the environmental investigations and bring them forward in the decision-making process to avoid conflicts of interest. (P Hansen 2010; Quote from interview translated from Danish by the author).

6.2 Decision-making process on the location of the aluminium smelter

The decision-making process leading up to the final decision on a location for the aluminium smelter happened primarily at meetings of the Administrative Coordination Group. Different choices were made that influenced the course of the decision-making (Hansen 2010). Based on interviews with central actors and a decision-making support report (Greenland Home Rule 2008), four main arenas that influenced the final outcome of the decision-making after the work on the SEA was initiated were identified (see Hansen 2010). After the agreement represented by the MoU, in July 2007 twelve sites were initially identified, located in three different municipalities; Nuuk, Maniitsoq and Sisimiut. In August 2007 the scoping for the SEA was conducted and the first arena where the number of sites was influenced after this was in October-November 2007 when five sites were excluded from further investigation on the basis of technical features. The second arena was in January when a decision support report was formulated, recommending a single site. This was approved in Cabinet in February 2008, which was the third arena, and finally it was accepted and given consent by the Parliament in May 2008. The decision-making process is illustrated in Figure 6.2.

6.3 The SEA process and content

When the Administrative Coordination Group decided to establish a SEA working group, a chair for the working group was appointed and a cross-departmental member group was established. In the national budget for 2008 approximately 0,8 billion US$ was allocated to the task the first year and 0,9 billion in 2009. The chair of the Administrative Coordination Group was affiliated to the Administrative Coordination Group for the cases that had direct relation to the SEA process (Hansen and Hansen 2008). Terms of reference for the SEA working group were formulated and approved on 25 April 2007 by the Administrative Coordination Group. The working group was structured with an executive board and five

themes, each with one individual formally in charge. Greenland Development A/S was affiliated (Greenland Home Rule 2007c).

The five themes or areas of responsibility in the SEA were:

1. Nature and environment
2. Culture
3. Health
4. Regional development
5. Cumulative effects

The involved directorates were each required to contribute material for a chapter in the final SEA report (Greenland Home Rule 2007d).

Under these headings different issues were approached. Inly 'health' was not addressed or assessed, even though it was described in the environmental report as being of great importance to assess health issues in relation to the project (Greenland Home Rule 2007a).

The SEA was carried out in relation to the decision regarding the location of alternative locations for the aluminium smelter operation. According to the strategic tiering of IAs, as described in chapter 3, *Strategic Environmental Assessment as a means to include environmental concerns in strategic decision-making*, and as presented in Table 3.1, the SEA can thus be described as a programme-plan IA (Hansen and Kørnøv 2010).

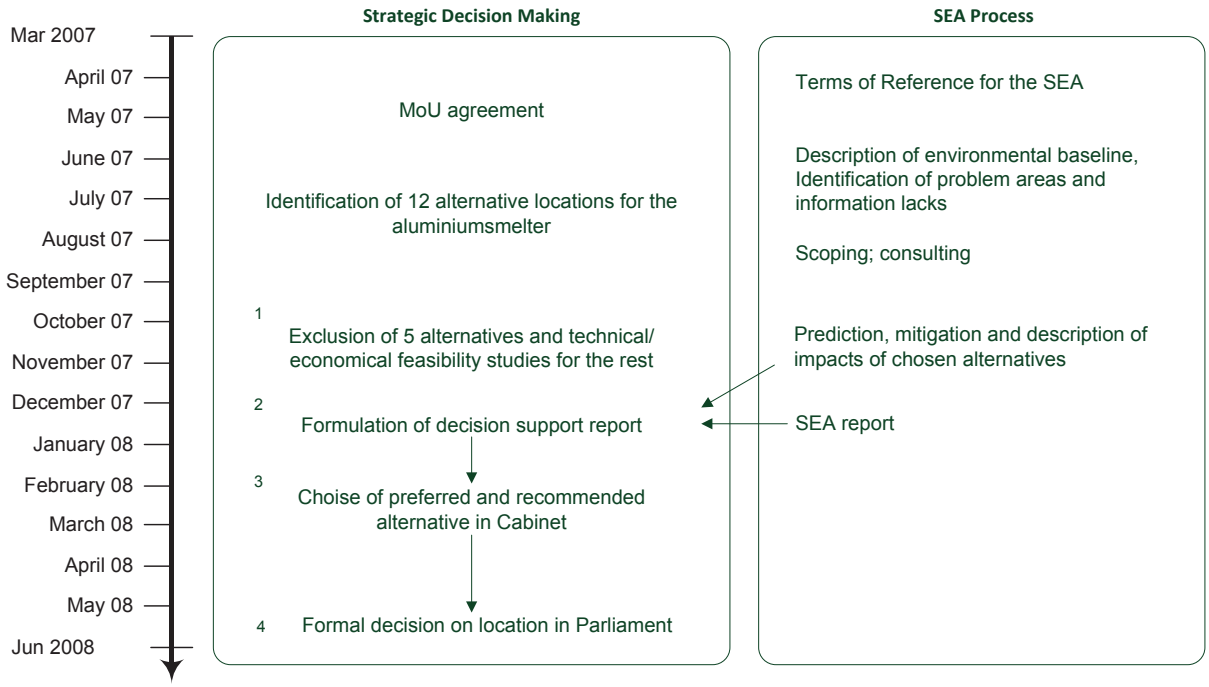

Figure 6.2: Process and timetable for the strategic decision-making in relation to the aluminium programme and the input from the SEA. Developed from Hansen (2010).

In relation to the decision-making process, the SEA did not feed into the process continuously during the process (Hansen 2010), as supposed according to the ideal model presented in Figure 3.2 above. Rather the interaction was concentrated in the last third of the process and in practice it was not the SEA working group that carried or represented the environmental knowledge when the decision support report was presented to the politicians. When the report was formulated, there was no further dialogue between the SEA working group and the other actors before the final decision was made (KG Hansen 2010).

7. Synthesis

This chapter synthesises and discusses the results from the research. Further details regarding the different analyses and their outcomes can be found in the papers in the second block of this thesis. The papers approach the research area from different angles and each paper feeds into discussions related to one or more topics, as described in paragraph 4.5 and illustrated in Figure 4.1. The findings presented are chosen with a focus on extracting the most interesting and the critical results.

7.1 Level of impact assessments in Greenland

The understanding and knowledge regarding the context of SEA in Greenland as investigated in this thesis is focused on the status of and the need for impact assessment in general and SEA in particular. The first result to which I would like draw attention in this regard is the *necessity to increase the strategic level of impact assessments in Greenland*. This is first pointed out in Hansen and Hansen (2008) where the benefits of the aluminium SEA are discussed, based on an overall description of the process of conducting the first and, so far, only official SEA in Greenland. The conclusion regarding the need for a higher strategic level in the assessments is supported by Hansen et al. (2008), which more specifically investigates the level undertaken in impact assessments in Greenland. The investigation of the strategic tiering of impact assessments is based on a scale with four categories; project, programme, plan and policy level. Policy is the highest strategic level and project the lowest. The results show that the policy and plan levels are not yet included in impact assessments in Greenland, and only a few impact assessments at the programme level (six known by the author) have been conducted while more (nine known by the author) have been conducted on the project level. Some of the assessments are very detailed, but still, the results show that the action to which they are applied and the reflections regarding cumulative impacts and alternatives place them in the lowest strategic categories. This means that the impact assessments do not carry the possibility of proactively and strategically including environmental concerns in decision-making regarding the planning and implementation of new industries.

Based on the ongoing developments, Hansen et al. (2008) discuss the need for considerations at the policy and plan levels with regard to the environment. The types of strategic questions which could be raised in this respect are shown in Table 7.1, which also points to the need for assessing alternatives and their impacts in terms of needs and capacities. The extension and the types of industries which can operate without significant negative and irreversible consequences for the Greenlandic environment, and the effect which this will have on other policy areas, like labour and commerce, needs to be defined. This discussion has not yet taken place in Greenland and decisions in this respect are yet to be made. Hansen and Kørnøv (2010) also support the assumptions regarding the need for higher level impact assessments in Greenland. By investigating the Greenlandic context from a value rational angle, letting the impact assessment professionals in Greenland themselves define the need and demand for impact assessment in Greenland, it is pointed out that impact assessments in Greenland should cover both the project level and strategic levels to secure proactive inclusion of environmental knowledge and thereby ensure that they lead to more sustainable decisions. A

gap is found in relation to the strategic level of the impact assessments. The environmental laws, even those that are still not implemented, only require impact assessments at the project level. However, both impact assessment practice and the expressed need/demand show that there is an interest and willingness to take the impact assessments to the strategic level, including both the programme and plan level of impact assessment. The policy level is not yet included in practice, neither is it formulated as a clear wish from the respondents.

Tier	*Type of questions which need to be raised*	*Basis for alternative assessment*
Policy	Whether or not to promote the development of mega industry in Greenland?	Societal development needs
Plan	The extent to which mega industrial development must take place in Greenland?	Societal capacity
Programme	Where to locate the industrial development in Greenland?	Regional and local capacity

Table 7.1: Higher level SEA required in the case of mega industry in Greenland.(Hansen et al. 2008)

A second result supported by more investigations which I would like to underline is a *lack of consistence in the content of the environmental reports* and hence in the concept of environment covered. This is identified in Hansen et al. (2008), which presents a comparison of the environmental parameters included in four environmental reports, representative of the variety of the impact assessments undertaken in Greenland, with the parameters recommended in the European SEA Directive. The comparison illuminates a wide variety in the environmental parameters included and hence a lack of consistence in the content and concept of environment they cover. The lack of consistence can be problematic when cumulative impacts of more projects are to be considered, and the transparency in relation to the process undertaken is vague as it is not possible to see how the parameters are chosen among others. The parameters included in the four cases are illustrated in Table 7.2. The variation could perhaps be explained by the scoping phase of the impact assessments, which has probably led to certain parameters being identified as irrelevant to include. As the scoping is not explained and the choice of the parameters included are not argued, however, the scoping and related reflections are not visible. The transparency and potential reflections behind the content are not visible and hence it is not possible to learn from the knowledge and experience related to this to apply in future situations. In Hansen and Kørnøv (2010) it is further shown how the legislative system in Greenland does not yet include the broad concept of environment, known from the EU Directive and other developed countries. But looking into practice in relation to the four impact assessment cases reviewed, it seems that more parameters than those prescribed in the law are taken into consideration. The variation in the parameters included can be explained as a consequence of the different and inconsistent laws in relation to minerals, on the one side, and industries on the other, as the different statutes require the inclusion of different parameters. Still the cases go beyond the

legal requirements in their descriptions, which could indicate the need for a broader concept of environment, to be able to give the full picture of the impacts of a certain project. The results from the analysis of values and interests of the professionals draw the same picture, as they show that all respondents find all the mentioned parameters relevant.

Environmental parameter	***Case 1***	***Case 2***	***Case 3***	***Case 4***
Biodiversity				
Fauna/Flora	√	√	√	√
Soil		√		
Water		√		√
Air		√	√	√
Population	√			
Human health	(√)	√		√
Climatic factors	√	√		
Material assets	√			
Cultural heritage	√		√	
Landscape		√	√	√
Interrelationship	√			

Table 7.2: Illustration of the parameters recommended in international guidelines that are included in four impact assessments reviewed (Hansen et al. 2008).

The analysis in Hansen and Kørnøv (2010) thus shows a demand for impact assessments to include a broad range of parameters, covering more than the physical environment. However, the impact assessment practice shows great variation in the breadth of the parameters included and the depth to which they are assessed in the reports. It should be noted that Table 7.2 is changed for 'Case 1', which is the aluminium SEA. Since Hansen et al. (2008) was written, a closer investigation of the environmental report has revealed that, even though health is mentioned in the text, no issues are identified or mitigation recommended and hence no assessment in relation to health has been carried out. Therefore parenthesis is added to 'health' under Case 1. The lack of consistence in the environmental reports points to a lack of common legal requirements for environmental assessments carried out in Greenland, as there is no shared concept in the legal acts and guidelines used. This is also backed up by the public opinion expressed in interviews with members of the public, who expressed their worries in relation to environmental protection in the study conducted by Hansen and Vium (2009).

The third main result, which I will underline in relation to the status, need and function of impact assessment in Greenland, is that *there are gaps between the needs expressed by*

professionals, legislation and practice in relation to the values and process for carrying out impact assessments. In Hansen and Kørnøv (2010) besides the results regarding impact assessment tiering and environmental parameters included, there are results that relate to values for impact assessment performance, responsibility and impact assessment involvement and access. All the gaps found are illustrated in Table 7.3. Remarkably, the gaps are mainly between the legislative framework and the needs/wants, while the practice and the needs/wants are closer to agreement. The exception is involvement in the process and access to the impact assessment results. Here the gap is related to both legislation and practice.

The needs/wants are actually a combination of the two others. The legislative system is focused on securing the environment through impact assessment, the large,international/multinational corporations interested in operating in Greenland conduct the impact assessments, and consequently the companies focus on conducting a good impact assessment to be able to gain permission to act. 16 Environmental professionals from Greenland find that the role of impact assessment is to balance the need for industrial development with the need for environmental protection.

	Impact assessment legislation		***Needs and wants***		***Impact assessment practise***
Values for impact assessment performance	Protecting the environment		Balancing development and environmental protection		Mitigation and securing industrial permission
Strategic level	Project tier	GAP	Project, plan and programme tiers		Project, plan and programme tiers
Responsibility	Public authorities, the politicians and companies		Public authorities, the politicians and companies		Companies, public authorities and politicians
IA involvement and access	Companies and authorities. Limited public access	GAP	Public authorities, companies, the public, researchers and politicians	GAP	Authorities and companies. Limited access for the public
Concept of environment	Different concepts. Primarily narrow	GAP	Broad concept of environment		Variations but in general broader than the law prescribes

Table 7.3: Gaps between needs/wants, impact assessment legislation and impact assessment practice in Greenland (Hansen and Kørnøv 2010).

Regarding responsibility, the analysis shows overall coherence between needs/wants, legislation and practice.

The second main gap is found in relation to needs/wants regarding involvement in the impact assessment process and access to the impact assessment results. As presented, the respondents agree on the need for a broad inclusion of stakeholders in the process and that stakeholders in general must have access to the results. Legislation, however, lacks clear statutory guidelines securing involvement and access to information. Limited access to environmental information has also been experienced in practice when the authors were trying to obtain environmental statements in Greenland.

With respect to the assessment process and participation, both practice and legislation are inconsistent with the expressed needs and wants. The legislation did not demand or motivate

public participation early in the decision-making process, or secure access to the impact assessment statements, and due to confidentiality some statements were not accessible to the public. The public has now gained access to the environmental statements.,But still the public do not have the opportunity to participate in the early part of the process. The Bureau of Minerals and Petroleum plans to conduct SEAs on a mandatory level (Rusbjerg and Hesseldahl 2010). The newest case studied, the SEA of aluminium smelter, however, points to a development of practice bending towards the expressed wants. In this case, openness in the process and access to the statements were secured, so this is seen as a step towards closing this gap.

Summing up, the results point to a need for the safeguarding and enhancing of public participation and access to the environmental statements. Further, the current industrial development in Greenland, along with climate change, points to the need for a strategic impact assessment covering the plan and programme level of decision-making in order to reduce the gap between wants/needs and the reality. This includes assessing alternatives and their impacts against the needs and societal capacities, which leads to questions like: How intensive an industrial development should be allowed?, Which industries can operate without significantly negative and irreversible consequences for the Greenlandic environment? and, How will this affect the environment and society cumulatively? This discussion has just started and no decisions have been taken in this respect (Hansen and Kørnøv 2010).

Tier	*Type of questions which need to be raised*	*Basis for alternative assessment*
Policy	Whether or not to promote the development of mega industry in Greenland?	Societal development needs
Plan	The extent to which mega industrial development must take place in Greenland?	Societal capacity
Programme	Where to locate the industrial development in Greenland?	Regional and local capacity

Table 7.4: Higher level SEA required in the case of mega industry in Greenland.

7.2 Effectiveness of the aluminium SEA

Up to this point in this thesis, effectiveness has been understood and investigated as 'direct' effectiveness, defined in the research as inclusion of environmental knowledge in decision-making. However, during the investigation of the aluminium case, a lot of other effects were revealed as well. I have decided to include these here as they are effects which are important to bear in mind when a SEA system is implemented in Greenland because of the limited experience in general. It is therefore the identified effects, rather than the narrower concept of direct effectiveness, that is referred to and presented here, divided into direct and indirect effects.

Starting with the presentation of the direct effects, understood as the inclusion of environmental knowledge in decision-making, Hansen and Hansen (2008) point out, based on a review of official documents regarding the process of the aluminium SEA combined with experiences expressed by the chair of the SEA working group, that the aluminium SEA brought several positive effects, some of which are highlighted as significant. The visible effects identified in Hansen and Hansen (2008) are, first and foremost, the environmental report and the formally arguments from politicians in the decision-making, which were articulated with reference to the report. Hansen et al. (2008) and Hansen and Kørnøv (2010) develop on this and add that the visible effect of the aluminium SEA report is being the most strategic and comprehensive report carried out in Greenland, and the broadest assessment in terms of environmental concept included and number of alternatives assessed.

Hansen (2010) focuses on specifically evaluating the inclusion of environmental knowledge and it is identified that environmental knowledge was accessible and used to argue the decisions made in three out of four key decision arenas that influenced the course and the final outcome of the decision-making process.

Furthermore, the indirect effects turned out to be essential to the planning process. This means that benefits other than those related to the objective of carrying out the SEA were obtained. These effects could seem to be relevant to the governmental institutions both to identify how the most benefit is gained in relation to carrying out SEAs and also in order to achieve an outcome from the investment of resources in carrying out SEAs if they lead to a situation where a project is turned down. This would be relevant to investigate further if and when SEA legislation is implemented. Distinguishing between indirect and direct effectiveness, it is clear that all the central actors interviewed point to indirect effectiveness, for example, changes in attitudes, learning and institutional changes, as effects of major importance to both the process and the outcome. This is also confirmed by the results in Hansen et al. (2010), which showed that the formal communication structures were changed by the actions of the actors in the decision-making arenas.

In this case study, the objective of the SEA related to the planning of a site for an aluminium smelter was to provide an overall overview of relevant problems, in addition to an assessment of the potential consequences of the choice of different locations, in order to support the decision-making. As the SEA was effective in securing inclusion of environmental knowledge in three out of four key decisions in the process, understood as the actors' short-term comprehension of environmental knowledge, and without distinguishing between different levels of inclusion, the conclusion must be that the SEA does conform to this main criterion of effectiveness, and thus also to the objective in the Greenlandic context.

When considering the results across the decision arenas, the review shows that the SEA was effective in three out of four arenas. Firstly, in relation to the assumption of presence and access to environmental knowledge, the decision-makers in three out of the four key decisions had access to environmental knowledge from the SEA, which was submitted as part of the decision support materials as well as part of presentations of the project from the government officials. The full SEA was furthermore accessible on the internet. Secondly, it was found that the SEA was used to argue the decisions made. A summary of the main results from the four key decisions is shown in Table 7.5.

	Arena 1	*Arena 2*	*Arena 3*	*Arena 4*
Date for the decision	20 Aug 2007	30 Jan 2008	21 Feb 2008	7 May 2008
Decision maker	ACG and Alcoa	ACG, GD and SEA	Cabinet	Parliament
Accessible environmental knowledge	No	Yes	Yes	Yes
Environmental knowledge used as argument	No	Yes	Yes	Yes
Primary outcome	5 sites excluded	Content of decision support report	Recommendation of Maniitsoq site 3	Selection of Maniitsoq site 3

Table 7.5: Summary of four decision arenas (Hansen 2010).

The first of the four key decisions is different from the others due to the fact that this decision was made before the preliminary results of the SEA were known. There can be several reasons for this early decision, which narrowed down the number of potential sites for the aluminium smelter. It was argued by the chair of the Administrative Coordination Group that this was due to economic interests. However, the SEA could also have influenced the exclusion of sites at this stage of the process and added to a narrower scope for the rest of the process if environmental considerations had been included at this stage. The SEA covered the whole area including all the potential sites. In this way, the same investigation was made in relation to the SEA despite the fact that some of the sites were excluded. The SEA would therefore have had the opportunity to be more effective if the process of conducting the SEA had begun earlier in relation to the planning. This could have resulted in the initial exclusion decision being based not only on technical data but also on environmental parameters. The effectiveness of the SEA both in the role of securing environmental knowledge in decision-making in the planning phase and as a facilitator of learning and institutional change indicates that there is a role for SEA in relation to the implementation of new industries in Greenland.

The results further indicate that the presence of the SEA, and thus environmental information and knowledge, in the decision-making arena as the environmental information is used to argue the decisions made in all the decisions were that environmental knowledge was accessible.

The indirect effect identified in Hansen and Hansen (2008) is increased awareness in the local society about environmental issues related to the potential aluminium smelter operation. Furthermore, the SEA led to a new approach and experience with cross-sectorial cooperation within the governmental administration, which created a shared insight in the project and the planning process, while the cooperation contributed to the effectiveness of the SEA. Finally the SEA contributed to political awareness and questions being raised regarding the need for and function of environmental assessments in Greenland (Hansen and

Hansen 2008). Further, Hansen (2010) points at; knowledge and understanding of environmental issues, learning, public participation, cross-sectorial cooperation, data collection from existing materials, gaining an overview of the existing knowledge, and understanding the possibilities of SEA.

7.3 Influence of SEA on decision-making regarding location of aluminium smelter

The focus area of the research is regarding the influence of the SEA on strategic decision-making. The purpose is to explain why the SEA was effective. Using Anthony Giddens' Structuration Theory, a frame for analysing the decision-making process was developed in chapter 5. The research focuses on two types of potential influence: the SEA working group's influence on the structures in the decision-making arenas, and the SEA's influence on the outcome of the decisions made. The results presented in this paragraph are structured after these.

In Hansen and Kørnøv (2010) the SEA working group's influence on the structures in the decision-making arenas was not investigated but nevertheless it was identified, as it was pointed out by actors interviewed that the SEA secured public participation in the process. The SEA also influenced the decision-making process as the SEA process and the decision-making processes were coordinated, so there was interdependence between the time schedules for the two processes. In Hansen et al. (2010) it was identified that the SEA working group changed the formal structure to become enabled to influence the desired outcome, namely inclusion of environmental knowledge in decision-making.

In relation to the SEA working group's influence on the decision outcome, Hansen (2010) found that the SEA secured the inclusion of environmental knowledge in decision-making in three out of four key decision arenas. Hansen et al. (2010) showed that the SEA's desired outcome was inclusion of environmental knowledge in decision-making. In three out of four key decision arenas this was obtained. In one instance, the SEA did not influence constrained by structure, The SEA was used to argue the key decisions made, including the final decision on selection of the site.

Communication is a resource that can be used to influence decision-making. If used differently from the way it is supposed to be used, the formal decision-making structure is influenced.

	Arena 1	*Arena 2*	*Arena 3*	*Arena 4*
Inclusion of environmental knowledge?	No	Yes	Yes	Yes
Communication according to the formal structure?	Yes	Yes	The SEA working group is not included in the process any longer. Informal communication is happening between the other actors as information is continuously delivered to the decision-makers before the formal decision-making	The SEA working group is not included in the process any longer Informal communication is happening between the other actors as information is continuously delivered to the decision makers before the formal decision-making
Is the decision made by actors with formal decision-making competence?	Yes, the SEA working group is not supposed to be making any decisions, and they are not making any. But there is still something happening informally, as Alcoa decided, when it should have been the ACG	No, the SEA working group did not have formal competence but still they decided on part of the content of the decision support report	Yes	No, the Cabinet holds the formal decision-making competence but it formally allowed the Parliament to decide
Influence?	No influence	The SEA working group influenced the outcome and reshaped the decision-making structure	The SEA working group influenced indirectly. Formal communication structure was changed but not by the SEA working group and not in favour of the SEA working group	The SEA working group influenced indirectly. Formal communication structure was changed but not by the SEA working group and not in favour of the SEA working group. The decision-making competence was changed but not by SEA working group and not in favour of the SEA working group

Table 7.7: SEA working group's influence on the decision-making regarding the location of an aluminium smelter(Hansen et al. 2010)

As presented in Table 7.7, in arena 1 the communication was happening according to the formal structures and the decision was made by the actors with formal decision-making competence. The SEA working group was not included nor had it secured communication with the decision-makers at this stage of the decision-making, it did not influence the

decision-making and environmental knowledge was not included. In arena 2 communications also happened according to the formal structure including the SEA working group in the communication. The decision-making competence was informal as the SEA working group was given the right to formulate the part of the decision support report for the politicians which concerned the environmental assessments for the different alternatives presented. The structure was hence reshaped and the SEA working group had influence and environmental knowledge was included. In arena 3 the SEA working group is not included in the decision-making process any longer. Informal communication is happening. The decision-making competence is following the formal rules. The SEA working group did not influence the process but as they had formulated the environmental part of the decision-making support report, the environmental information was carried into the arena by the other actors and thus the SEA working group indirectly influenced the decision-making as environmental knowledge was included and used to argue the decisions made. In arena 4 the SEA working group was again excluded from the process, but the decision-making support report was carried into the process by the other actors. The communication did not follow the formalised structures. The decision-making competence was delegated to the Parliament even through the Cabinet had the formal competence. The SEA report was used to argue the decision made and thereby indirect influenced was gained.

The actions of the other actors thus secured the SEA's effectiveness, as they allowed the environmental statement to be included in its original version in the final decision support report without correcting, changing or in other way influencing the content. After the environmental information was included in the materials, the SEA working group was excluded from further communication and thereby constrained in its access to influence further. It was therefore again the interests of the other actors that carried the environmental information further on in the process. If the other actors had not been interested in promoting the environmental results, there is no guarantee that the environmental knowledge would have been accessible, as the SEA working group was not included.

Looking at the full decision-making process, it shows that the formal structures did not secure influence for the SEA working group. Environmental knowledge was included in the process, but this was not due to the structures, as the SEA working group was not included in the first or the last part of the process. Rather it was due to the other actors' interest in promoting the environmental arguments, which were in support of the site recommended. If the environmental knowledge had been in opposition to the economic recommendations, then the actors representing the environmental considerations in the process would maybe not have had the access to influence the decision-making arenas they enjoyed in practice.

The effectiveness of the SEA, both in the role of securing environmental knowledge in decision-making in the planning phase and as a facilitator of learning and institutional change, indicates that there is a need for SEA in relation to implementation of new industries in Greenland. Still the result of the analysis leaves the question of why the SEA was effective. There can be different reasons for the effectiveness of the SEA in this case. Would the SEA have been as effective, for example, if environmental impacts of significant 'showstoppers' had been detected? By the word 'showstoppers' the actors meant negative impacts considered of such high significance that implementation of the project was not possible. Or did it simply have to do with the fact that the SEA was continuously adjusted to match the

needs in the process? These are questions that still need attention in order to identify how impact assessments in Greenland can support decision-making processes.

The overall results indicate that accessibility of environmental information determines whether or not environmental knowledge is obtained and used. Further the power dynamics in decision-making processes strongly influence the process. Communication and decision-making is hence often informal but still influences the structures and outcome of the decision-making process. The influence of power dynamics makes it hard to predict when and where the decision is made in practice. If environmental information is fed into the decision-making process when the decision is formally supposed to be made, according to the formal structures, there is a risk that the decision is actually already made. The formal structures are influenced by the actions of the actors. Structures are influenced during the process and are therefore not stable. To ensure that environmental knowledge is accessible at appropriate times in the decision-making process and thereby secure environmental knowledge in decision-making, it is crucial for the SEA practitioners not only to follow the structures but also to communicate with the other actors and gain an understanding of the development in the process, and to use resources to ensure that information is shared when it is needed.

8. Conclusion

Greenland is presently facing new challenges. A wish for independence and economic growth is pursued by the implementation of new mega industries, including aluminium production, mining and oil extraction. There is a political engagement with the need to promote industrial development. At the same time there is a declared need and desire for the development to happen in a sustainable manner. Impact Assessments on the project level have been used in practice to secure the inclusion of environmental considerations in decision-making when new industries are planned, and thereby to promote sustainable development. Environmental impact assessment legislation and guidelines are implemented in Greenland covering projects within the extractive industries. Further new legislation in relation to other activities on the project level is being developed by the governmental administration. Environmental impact assessment at the project level covers the question of 'how' an industrial project should be designed and implemented to mitigate environmental damage. On the international level, Strategic Environmental Assessment (SEA) is recognised as a tool to promote sustainable development by securing environmental considerations earlier in decision-making than the Environmental Impact Assessment. SEA concerns questions like 'which' and 'how much' industrial development is to be implemented. SEA is hence developed to secure environmental concerns on the more strategic policy, plan and programme levels of decision-making. Today there is no legal demand or requirement for conducting SEAs in Greenland. However, Greenland consented to the UNEP Protocol on Strategic Environmental Assessment in 2010 and will therefore be developing a related legislation system in the near future. This thesis is motivated by the challenge of promoting sustainable development by inclusion of environmental concerns in decision-making on the strategic level when new industries are planned in Greenland. The research presented was focused on the role and function of a non-mandatory SEA in a decision-making process when an aluminium smelter operation was planned. Based on this, the thesis investigated the question of: **How does SEA become effective in a Greenlandic context?** and the three related research questions:

- *What is the role and function of impact assessment in Greenland?*
- *When and how was the aluminium SEA effective?*
- *Why did the aluminium SEA influence decision-making?*

In this chapter the implications of the findings related to the research questions are presented in a holistic perspective and discussed. Further reflections are made regarding the contribution of this thesis to the research field, including the methodology, approach and theory used.

8.1 Findings and implications

Regarding the first question of: *What is the role and function of impact assessment in Greenland?* The research presented in this thesis has confirmed a need for impact assessments at both the project, programme and plan levels of decision-making in Greenland to promote sustainable development. This is expressed by the level of activities which are being decided upon, and by local professionals with knowledge and understanding of impact assessment. Legislation and practice in Greenland do not meet this need today. To make impact assessment fulfil the desired role it needs to be conducted on higher strategic levels, based on a broad concept of environment and with increased stakeholder access and

involvement in the processes. If not, the impact assessment will risk becoming no more than an academic exercise where environmental knowledge is not obtained or included in the decision-making.

In relation to the second research question: *When and how was the aluminium SEA effective?* The results underlined that for a Greenlandic impact assessment system to become effective in securing the inclusion of environmental knowledge in decision-making, it is also necessary for the assessments to feed into strategic decision-making processes before decisions are made in practice. In relation to the new industries, SEA needs to be conducted when questions are raised regarding whether a new industry should be implemented, when it should be implemented, and where it should be implemented, while EIAs should be conducted when these questions have been answered in order to design the different projects with mitigation of impacts on environment. This is expressed by both former research on SEA and backed up by the Impact Assessment professionals from Greenland

Actors have different expectations of the decision-making process and hence of the role and effectiveness criteria of an impact assessment. Time-effectiveness and cost-effectiveness are types of effectiveness which are often in focus from stakeholders. In the case of the aluminium SEA, indirect effects were identified during the research. Besides the result in the form of the environmental report, the process of conducting the SEA was shown to increase the degree of public involvement in the process and create an administrative awareness of the implications of the project. The aluminium SEA was conducted at the programme level of decision-making and hence at the lowest strategic level. Still it addressed both the alternatives and the cumulative impacts according to international standards. Later the focus of the effectiveness concept used as an approach for evaluating the aluminium SEA was narrowed to focus on direct environmental effectiveness, as the role of the SEA was to secure inclusion of environmental knowledge in decision-making. The direct effectiveness was investigated in the aluminium case, which showed that the SEA was feeding information into the decision-making process in just one of the four key decision arenas. However, the SEA was actually integrated into the planning process and presented as information support to the decision-makers and was also used to argue for the decision made. In this way the SEA became effective in securing environmental knowledge in the decision-making process.

As the SEA was found to be effective during the first part of the research focus was then on the capacity of the SEA practitioners in form of the SEA working group in relation to the third research question: *Why did the aluminium SEA influence decision-making*. Based on Anthony Giddens Structuration Theory and related concept of power the question was directed to focus on the actors use of resources in the decision-making arenas to find out if the formal structures secured the SEA practitioners' capacity to influence decision-making and secure inclusion of environmental knowledge? Actually all of the four key decisions which determined the direction of the decision-making and thereby the final outcome were strongly influenced by power dynamics. Despite formalised rules and decision-making competence, both the outcome of the decision-making and the structures of the process were changed due to the informal communications and actions of actors. The effectiveness in inclusion of environmental knowledge was therefore not secured by conducting a SEA through the formalised structures in the decision-making arena, and hence merely carrying out an SEA will not secure its effectiveness. The SEA did not influence the first key decision arena as the

SEA working group was not included in the communication and therefore the SEA workinggroup did not have the possibility formally to exercise influence at this early stage. The SEA was found to be effective in securing environmental knowledge in the last three key decision arenas, but the study of power dynamics showed that the reason that the environmental knowledge was included in the decision-making process was not due to the formalised structures of the process. The effectiveness was secured due to the other actors' recognition of the importance of letting the SEA working group formulate the statement and thus enabling it to exercise influence.

So summing up in relation to the main research question: ***How does SEA become effective in a Greenlandic context?*** The conclusion is that SEA is a tool to promote sustainable development through the inclusion of environmental knowledge in decision-making. To promote sustainable development in relation to the implementation of new industries in Greenland, SEA needs to be implemented on the highest strategic levels and hence when it is decided whether an industry should be implemented, when it should be implemented, and where it should be implemented. To secure the inclusion of environmental knowledge in decision-making in the Greenlandic context, such knowledge needs to be feeding into decisions regarding the implementation of the new industry continuously from the very beginning of the planning processes. The implementation of SEA regulation and carrying out SEA procedures does not in itself secure that the SEA will be effective, and therefore it is important to create structures that give the SEA practitioners access to both communication and influence on the outcome of the decision-making process. Further, the practitioners still need to be aware of the actions of other actors on the scene and to be aware of when decisions are made in practice and use their access to the decision-making process actually to influence it.

8. 2 Contribution of the thesis

Evaluation of SEA effectiveness can focus on different aspects of the SEA, including: evaluation of the consequences of conducting a SEA; evaluating the methods and their implementation; and evaluation of the outcome in the form of the environmental protection or precaution. This thesis has investigated the links between SEA and strategic decision-making processes. The thesis has contributed to the research field with empirically based knowledge regarding effectiveness of SEA and added knowledge of the implications of structural power dynamics in relation to SEA's capability to influence strategic decision-making processes. To study the results from the case study from a theoretical perspective I explained how communication is a primary resource for SEA practitioners to secure the effectiveness of SEA in decision-making, as power strongly influences the linkage between SEA process and decision-making process. The contribution of this thesis to the research field is primarily related to the investigation and discussion of power and effectiveness in SEA, but it further contributes to the research field by developing an approach to the evaluation of SEA effectiveness in decision-making arenas that is influenced by power dynamics. Furthermore the thesis contributes with the first empirical investigations and evaluation of the function and role of impact assessment in a Greenlandic context.

The use of the theory of structural power has been a way to approach the study of actors in a decision-making process. Giddens' Structuration Theory has been a useful point of departure as a meta-theory to develop an approach to the case study, which gave the possibility of enlightening the role and capacity of actors as agents, and the interrelationship between

actors and their use of power to influence the structures and outcomes of decision-making processes. The theory and the study shifted the focus from the formal procedures to include also the informal structures, where communication was shown to have an important influence on the capacity to influence decision-making.

During the research, the concept of effectiveness was defined and studied as securing inclusion of environmental knowledge in decision-making. Still the research has shown that effectiveness is a quite complex concept to investigate, as indirect effects like learning and democratisation of processes were effects that were identified even though they were not a part of the investigation. This indicates that, based on the definition of the concept of effectiveness, it is possible to obtain different results. On this basis, it can therefore be assumed that, even in a case where SEA is ineffective in securing environmental knowledge, it can be effective in other ways.

This thesis has investigated impact assessments in Greenland in general and SEA in particular, in a Greenlandic context. The thesis points to several initiatives that need to be taken to ensure that impact assessments are carried out as a tool to promote sustainable development in Greenland, and in such a way as to meet the needs to fulfill this role. Carrying out mandatory impact assessments has already caused environmental knowledge to be included in decision-making on the strategic level. There are many more strategic decisions to be made in the near future regarding the future of Greenland, and SEA, if conducted correctly and used to feed into decision-making processes, can have an important role to play in this regard.

The research regarded a single extreme case study. It is not possible to generalise on the base of a single study. Still the aluminium SEA was the first Strategic Environmental Assessment to be conducted in relation to a large specific industrial project in Greenland and the research has drawn upon the experience of the process. Many industrial projects in Greenland are likely to be assessed on this level in the future and it is therefore important to learn from the experience of planning a potential aluminium production in Greenland. Even if the aluminium smelter is not implemented Greenland has learned and this way benefitted from the planning process.

Based on the results, reflections, discussions and conclusions presented in this first block of the thesis, I can finally conclude that:

Peoples interests, choices and actions influences strategic decision-making processes. The individual and the interaction between individuals are central for the process and hence for the effectiveness.

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Af KLAUS GEORG HANSEN, Nuuk og ANNE MERRILD HANSEN, Ph.d. studerende, Aalborg Universitet

Miljø og megaindustri

– strategisk miljøvurdering af Grønlands potentielt første aluminiumsprojekt

1.0 Når ønsket om selvstændighed skal vejes op mod pres på naturen

Da Grønlands Hjemmestyre og Alcoa i maj 2007 underskrev en samarbejdsaftale, Memorandum of Understanding, blev det samtidig fastlagt, at Landsstyret frem til forårssamlingen i 2008 skulle udarbejde et grundigt beslutningsgrundlag, så Landsstyre og Landsting på et solidt fundament kan træffe afgørende beslutninger om, hvorvidt aluminiumsprojektet skal fortsætte og om, hvor en eventuel smelter skal placeres. Som en del af beslutningsgrundlaget skulle der indgå en vurdering af projektets potentielle konsekvenser for miljøet i bred forstand. Ved udarbejdelsen af en strategisk miljøvurdering som en del af det samlede beslutningsgrundlag er der blevet introduceret et nyt niveau for miljøvurderinger i Grønland. Processen omkring udarbejdelsen og diskussionen om, hvad miljøvurderingen skulle bruges til og hvornår, har stillet nye udfordringer til den politiske proces omkring aluminiumsprojektet, og måske vil arbejdet komme til at danne præcedens i forhold til kommende større industriprojekter. Det foreløbige resultat af miljøvurderingen er dels en håndgribelig miljørapport, dels en debat og bevågenhed omkring de miljømæssige spørgsmål i samfundet samt i høj grad en ny erfaring med tværsektorielt samarbejde i Hjemmestyret. Endelig har udarbejdel-

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Anne Merrild Hansen er opvokset i Sydgrønland og er senere uddannet som civilingeniør med speciale i planlægning. Efter endt uddannelse har hun arbejdet i seks år ved Qaqortoq Kommune, først som planlægger ved teknisk forvaltning og senest som erhvervs- og arbejdsmarkedschef. Anne Merrild Hansen arbejder desuden løbende som selvstændig konsulent på udvalgte projekter.
Ph.d. projektet omhandler strategisk miljøvurdering og megaindustri i Grønland.
Baggrunden for projektet er, at Grønland står overfor nye og væsentlige tiltag på råstofindvindingsområdet og etablering af aluminiumsindustri, hvilket stiller nye udfordringer til natur- og miljøplanlægning på både projekt- og strategisk niveau.

KLAUS GEORG HANSEN, f. 1961. Mag.art. et cand.mag. i etnografi samt grønlandske sprog og kultur, Århus Universitet 1992. 1993-1998 forskningsbibliotekar ved og leder af Groenlandica, Grønlands Nationalbibliotek. 1999-2003 leder af Sisimiut Museum. 2004-2006 underviser i grønlandsk ved Sprogcentret og udvikler af e-læring. 2006- afdelingschef i Grønlands Hjemmestyre med ansvar for landsplanlægning. Har publiseret om emner om Grønland som mentalitetshistorie, kolonitidshistorie samt informationsteknologi og demokrati.
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sen af den strategiske miljøvurdering været med til at rejse spørgsmålet om hvilke miljøvurderinger, der skal kræves udarbejdet i fremtiden, hvem der skal udarbejde dem og, hvilken rolle de skal spille i beslutningsprocesser i tilknytning til megaprojekter fremover.

RESUMÉ

I Grønland findes der et grundlæggende politisk ønske om at beskytte og bevare det oprindelige naturlige miljø i landet. Samtidig er der et ønske om økonomisk vækst og hurtig erhvervsudvikling. Det er ambitionen, at etablering af nye megaindustrier skal give Grønland mulighed for at blive økonomisk mere uafhængig af bloktilskud fra Danmark og dermed blive mere selvstændig på sigt. Men det er et faktum, at nye industrier vil medføre øget pres på miljøet. Det amerikanske aluminiumselskab Alcoas interesse for at etablere et megaindustriprojekt i form af en aluminiumssmelter i Grønland, har pludselig gjort både sandsynligheden for økonomisk selvbærenhed større og den miljømæssige konsekvens af erhvervsudvikling meget synlig. Denne artikel har fokus på den strategiske miljøvurdering, der er udarbejdet i tilknytning til aluminiumsprojektet, som den første af sin slags i Grønland. I artiklen forklares det, at der i Grønland findes to forskellige natur- og miljøreguleringer, dels Råstofloven, der indtil 2009 er reguleret under hjemmestyreloven, og dels den nationale natur- og miljøbeskyttelseslovgivning. På råstofområdet er der i dag stor erfaring med miljøvurderinger af mega industriprojekter, mens der ikke findes noget lovmæssigt krav om miljøvurdering indenfor andre erhverv. Aluminiumssmelteren med tilhørende bygninger, anlæg, havn mv. er således det første megaindustriprojekt i Grønland, der ikke relaterer sig til råstofudvinding eller levende ressourcer. I artiklen beskrives dels baggrunden for den strategiske miljøvurdering, såvel som processen indtil i dag og samler op på nogle af de erfaringer, der er gjort undervejs. I artiklen konkluderes det, at det foreløbige resultat af den strategiske miljøvurdering dels er en håndgribelig miljørapport, men processen omkring udarbejdelsen har også resulteret i en debat og bevågenhed i samfundet samt nye erfaringer med tværsektorielt samarbejde i Hjemmestyret. Det forklares også, at udarbejdelsen af den strategiske miljøvurdering vil være med til at rejse nye spørgsmål til form og indhold af fremtidige miljøvurderinger, samt hvem der skal udarbejde dem, og hvilken rolle de skal spille i beslutningsprocesser i tilknytning til megaprojekter fremover.

Artiklen her handler om metode, udvikling og udarbejdelse af den strategiske vurdering af de miljømæssige konsekvenser for etablering af aluminiumssmelter og tilhørende anlæg som vandkraftværker, veje, havn, dæmninger, transmissionsledninger mv. Først sættes projektet med en aluminiumssmelter ind i en lidt større grønlandsk udviklingsmæssig sammenhæng. Dernæst gennemgås tilblivelse og rammer for udarbejdelsen af den strategiske miljøvurdering og resultat og erfaringer diskuteres.

2.0 Det globale i Grønland

Grønland har i 300 år været en del af den globale vestlige verden. Alene det faktum, at Grønland blev koloniseret i 1700-tallet viser, at Grønland blev tænkt med som en del af den vestlige verden. Hvalspæk og kryolit er blot to af de ressourcer, som verdenssamfundet gennem årene har hentet i Grønland. Disse aktiviteter berørte ikke i særlig grad den enkelte grønlænder direkte.

Det er nu over 50 år siden, at Grønland var en lukket koloni, hvor man skulle have tilladelse fra de danske myndigheder, før man kunne rejse ind i Grønland. I 1950'erne og 1960'erne var den grønlandske åbning mod omverdenen primært mod Danmark. I 1980'erne gav blandt andet sælskindskampagner og afholdelse af ICC konference i Nuuk på hver sin måde borgerne et klarere billede af, hvilke direkte påvirkninger de globale strømninger kan have på Grønland.

3.0 Grønland i det globale

Grønland har også spillet en mere udadrettet og aktiv rolle i den globale sammenhæng. Op gennem det 20. århundrede har eksport af grønlandske saltede torsk sikret den daglige mad for millioner at fastende katolikker. Tele Greenland havde i 1990'erne et datterselskab, som konkurrerede på det informationsteknologiske verdensmarked,

Det er et faktum at nye megaindustrier i Grønland vil medføre øget pres på miljøet. (FOTO: RC-Entreprenørservice)

og med Royal Greenland er Grønland en af de største aktører på verdensmarkedet for koldvandsrejer. Politisk spiller Grønland en aktiv og fremtrædende rolle omkring oprindelige folk i FN regi.

Den første fysiske afkolonisering i Grønland kan sættes til 1979, hvor Grønland fik hjemmestyre. På det politiske plan har Grønland – i lighed med mange andre tidligere kolonier – aktivt arbejdet for en løsrivelse fra den tidligere kolonimagt. Også i lighed med andre tidligere kolonier har Grønland (siden 2002) gennemlevet en mental afkolonisering, hvor vi nu oplever, at nogle gruppers indadrettede søgen mod grønlandske rødder går side om side med andre gruppers udadrettede søgen mod større aktiv deltagelse i det globale.

Med aluminiumsprojektet er Grønland i gang med at udvikle et nyt koncept for eksport af landets ressourcer. Denne gang handler det om eksport af miljøvenlig energiproduktion i stor målestok.

4.0 Miljøregulering, miljøvurdering og placering af en smelter

I Grønland eksisterer der to sæt miljø- og naturlovgivning. Det ene sæt henhører under Hjemmestyrets egen lovgivning. Det andet sæt henhører under Råstofloven, som er et fællesanliggende mellem Grønlands Hjemmestyre og den danske stat. Grunden til denne opdeling skal findes i forhandlingerne tilbage i 1970'erne op til vedtagelsen af loven om hjemmestyre i Grønland. Loven opererer med rigsanliggender, hvor eksempelvis sager vedr. kongehuset henhører, hjemmestyreanliggender, hvor blandt andet den almindelige miljø- og naturlovgivning hører hjemme, og fællesanliggender, hvor blandt andet den særlige miljø- og naturlovgivning i relation til mineral- og kulbrinteaktiviteter findes. Som allerede anført er anledningen til, at Grønland nu har udarbejdet en strategisk miljøvurdering, at der er politiske overvejelser i gang om, hvorvidt Grønland skal sige ja eller nej til etablering af en aluminiumssmelter i Vestgrønland. Industriprojekter som en aluminiumssmelter hører under den Grønlandske miljø- og naturlovgivning, hvorimod mineralefterforskning, minedrift og boring efter olie og gas hører under Råstofloven (Statsministeriet, 1978), (Grønlands Hjemmestyre, 1998).

Gennem 1980'erne og 1990'erne har Grønland udviklet en klar procedure for administration af projektansøgninger i forhold til råstofaktiviteter. Henvendelser fra virksomheder, der ønsker at lede efter eller udvinde mineraler eller kulbrinter, behandles primært administrativt på baggrund af politisk godkendte retningslinier. Det igangværende aluminiumsprojekt er et industriprojekt og er derfor ikke omfattet af de særlige ordninger, som findes på råstofområdet. I modsætning til råstofområdet har Grønland ikke tilsvarende retningslinier for store industriprojekter i øvrigt. Den administrative behandling af aluminiumsprojektet har derfor været kendetegnet ved en række ad hoc løsninger, og det har på mange måder præget processen frem til nu. Dette er nærmere beskrevet i artiklens afsnit om proces og planlægning af den strategiske miljøvurdering (BMP, 2007).

Råstofprojekter og industriprojekter adskiller sig på en række områder fra hinanden. Typisk placeres et råstofprojekt, hvor råstofferne findes, og det er i de fleste tilfælde ikke i nærheden af eksisterende bebyggelse. Desuden er der oftest en relativ kort tidshorisont på råstofprojekter. Heroverfor står så – i første omgang det enlige – megaindustriprojekt med en aluminiumssmelter og tilhørende anlæg, hvor placering i langt højere grad er op til en politisk beslutning, og her er udgangspunktet tilmed, at det skal være i nærheden af en eksisterende by. Frem til slutningen af februar 2008 var der tre byer i spil, Nuuk, Maniitsoq og Sisimiut. Landsstyrets oplæg til Landstinget er, at en eventuel smelter skal placeres i Maniitsoq. En beslutning om placering af en aluminiumssmelter forventes at blive truffet i Landstinget i sidste del af april 2008 (Greenland Development, 2008).

5.0 Den strategiske miljøvurdering - proces og planlægning

Baggrunden for initiativet til udarbejdelse af en strategisk miljøvurdering skal findes tilbage i efteråret 2006 i forbindelse med indgåelse af en Joint Action Plan mellem Hjemmestyret og Alcoa. Som følge af plansamarbejdet oprettede Hjemmestyret en styregruppe, som blev kaldt "Administrativ Følgegruppe". Den blev senere omdøbt til: "Administrativ koordineringsgruppe". Styregruppen havde til formål at forholde sig til Alcoas henvendelse med et ønske om at etablere en aluminiumssmelter i Grønland. Som medlemmer blev udpeget direktører fra de mest relevante direktorater, med Erhvervsdirektoratets direktør som formand. Den overordnede administration af aluminiumsprojektet blev samtidigt ressortmæssigt placeret i Erhvervsdirektoratet. Nogle udvalgte medarbejdere samt Greenland Development blev desuden tilknyttet som tilforordnede. Under Administrativ Følgegruppe blev der i december 2006/januar 2007 nedsat tre hurtigt arbejdende udvalg. Udvalgene skulle pege på relevante områder, der skulle undersøges nærmere inden der blev taget stilling til det videre forløb og samarbejde. Udvalgene beskæftigede sig med emnerne:

- Infrastruktur, miljø og natur
- Arbejdsmarked og samfund
- Økonomi

Der er i mange år blevet lavet vurderinger af virkninger på miljøet ved store anlægsprojekter i Grønland, eksempelvis ved etablering af vandkraftanlæg og minedrift. Formålet med en vurdering af virkninger på miljøet er ud fra den forudsætning, at når et projekt er vedtaget, at vise, hvordan projektet konkret kan gennemføres med mindst mulig påvirkning af miljøet. I tilknytning til aluminiumsprojektet valgte infrastruktur, miljø og natur arbejdsgruppen dog at pege på, at der burde arbejdes på et højere strategisk niveau ved udarbejdelsen af en strategisk miljøvurdering. Forskellen på en vurdering af virkninger på miljøet og en strategisk miljøvurdering er blandt andet, at en strategisk miljøvurdering belyser flere alternativer og udarbejdes forud for, at der tages en endelig beslutning om, hvorvidt et projekt skal gennemføres, mens en vurdering af virkninger på miljøet udarbejdes efter en beslutning er truffet.

- Strategisk miljøvurdering: **SMV**: *Om* og *hvilken* type udvikling der skal finde sted. Omfatter oftest flere alternative lokaliteter. Berører politikker, planer og programmer (flere indbyrdes afhængige projekter). Udarbejdes før beslutning er truffet. Finansieres oftest af myndighederne.

- Vurdering af virkninger på miljøet: **VVM**: *Hvordan* udvikling kan ske med færrest negative miljøkonsekvenser. Relaterer sig som oftest til én konkret lokalitet og et konkret og fastlagt projekt. Udarbejdes efter beslutning om etablering er truffet. Finansieres oftest af bygherren.

Der er flere styrker ved en strategisk miljøvurdering, der på internationalt niveau anvendes som et redskab i indsatsen for en bæredygtig udvikling. Strategisk miljøvurdering er i familie med vurdering af virkninger på miljøet, der er omfattet af Espoo-konventionen, som Grønland har tiltrådt. I tilknytning til aluminiumsprojektet blev det valgt at anbefale en strategisk miljøvurdering med henblik på at integrere miljøhensyn i den politiske beslutnings- og planlægningsproces dels for at undgå eller afbøde eventuelle mulige miljøpåvirkninger i tilknytning til aluminiumsprojektet, dels for at kunne prioritere miljøhensyn ved valg imellem alternative placeringsmuligheder (Grønlands Hjemmestyre 2007, 4-7), (SMV, 2007).

På baggrund af arbejdet i de tre udvalg blev der formuleret en redegørelse til Landstinget: "Redegørelse om energiintensiv Industri i Grønland". I april 2007 blev redegørelsen behandlet i Landstinget, der tilsluttede sig. En af anbefalingerne var, at der forud for en endelig beslutning om såvel igangsætning af projekt, som placering af aluminiumssmelteværk skulle gennemføres en strategisk miljøvurdering. Senere i processen skal der udarbejdes vurderinger af virkninger på miljøet, når det mere præcist er fastlagt, hvor smelteren skal placeres og, hvordan vandkraftanlæggene skal designes (Grønlands Hjemmestyre, 2007).

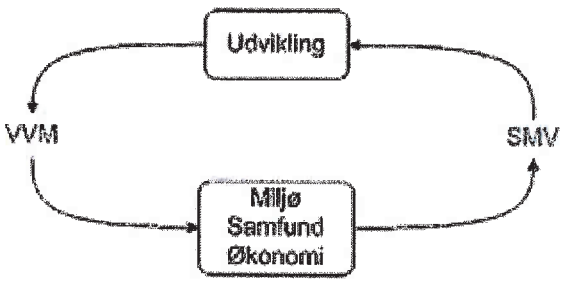

Fig. 1: Forholdet imellem VURDERINGER AF VIRKNINGER PÅ MILJØET og STRATEGISK MILJØVURDERING, versioneret efter (CSIR, 1996)

I figur 1 er forholdet mellem vurderinger af virkninger på miljøet og strategisk miljøvurdering illustreret. Hvor vurderinger af virkninger på miljøet adresserer effekterne af en given udviklingsaktivitet i forhold til miljø, samfund og økonomi, peger strategisk miljøvurdering på strategiske tiltag i tilknytning til potentielle udviklingsmuligheder, med andre ord påvirker strategisk miljøvurdering rammerne, der sættes for den fremtidige udvikling (CSIR, 1996), (Kørnøv, 2007, 400-401).

Arbejdet med vurderinger af virkninger på miljøet i tilknytning til aluminiumsprojektet vil blive langt mere detaljeret end de gennemførte undersøgelser af strategisk miljøvurdering undersøgelser. I vurderinger af virkninger på miljøet fokuseres direkte på de områder, der vil blive berørt af vandkraftværker, dæmninger, transmissionsledninger, smelter, havn m.m. Vurderinger af virkninger på miljøet undersøgelserne vil dog komme til at omhandle en lang række af de samme spørgsmål, der er nævnt i strategisk miljøvurderings-rapporten.

5.1 Stratefisk miljøvurdering arbejdsgruppe

I forlængelse af tilslutningen til Redegørelse om energiintensiv Industri i Grønland, blev det besluttet i administrativ koordineringsgruppe at nedsætte en strategisk miljøvurdering arbejdsgruppe, og administrativ koordineringsgruppe udpegede en formand for arbejdsgruppen. Strategisk miljøvurdering arbejdsgruppen blev nedsat på tværs af de relevante direktorater, og der blev afsat midler til projektet i finansloven for 2008 med en tillægsbevilling på fire millioner kroner og et overslag på 4,3 millioner for 2009. Strategisk miljøvurdering arbejdsgruppens formand blev løst tilknyttet administrativ koordineringsgruppe for sager, der havde direkte relation til strategisk miljøvurdering processen. (Grønlands Hjemmestyre, 2007).

Hjemmestyrets arbejde med strategisk

April – maj 2007:	Opstart og strukturering.
Juni – august 2007:	Indgåelse af aftaler med bidragsydere.
August 2007:.	"Forudgående Offentlighed" om udformningen af strategisk miljøvurderingen.
August – september 2007:	Bidragyderne (konsulenter m.fl.) udarbejder materiale. Deadline principielt den 1. oktober 2007.
Oktober – november 2007:	Foreløbig strategisk miljøvurdering 2007 rapport skrives. Inklusiv intern høring i direktoraterne.
December 2007 – januar 2008:	Offentlig høring strategisk miljøvurdering 2007 rapport med borgermøder i de berørte kommuner.
Marts 2008:	Aflevering af revideret strategisk miljøvurdering 2008 rapport til politisk behandling.
April 2008:	Politisk beslutning om placering af smelter.
Hele 2008:	Indsamling af yderligere strategisk miljøvurdering relevant viden.
Primo 2009:	Aflevering af endelig strategisk miljøvurdering 2009 rapport.
Efterår 2009:	Endelig politisk beslutning om hvorvidt projektet gennemføres.
2009 - 2010:	Opsamling og monitering af strategisk miljøvurdering området. Midler er endnu ikke fuldt ud sikret.

Figur 2, Opdateret tidsplan for strategisk miljøvurdering arbejdsgruppen.

miljøvurdering skulle foretages i henhold til et kommissorium, der blev vedtaget den 25. april 2007 i administrativ koordineringsgruppe. Strategisk miljøvurdering arbejdsgruppen blev struktureret med et forretningsudvalg og fem ansvarsområder med hver sin tovholder samt Greenland Development som tilforordnet.

De fem tema/ansvarsområder i strategisk miljøvurderingen:

1. Miljø & natur
2. Kultur
3. Sundhed
4. Regional udvikling
5. Kumulativ undersøgelse

I kommissoriet indgik en tidsplan for udarbejdelsen, og de involverede direktorater skulle hver især bidrage med materiale til et kapitel i strategisk miljøvurdering rapporten. Imidlertid blev datoen for forårssamlin-

gen i Landstinget rykket frem. Det betød, at strategisk miljøvurderingen skulle være færdig før planlagt, og tidsplanen blev således strammet op undervejs. Den opdaterede tidsplan fremgår af figur 2.

Som det fremgår af figur 2 vil strategisk miljøvurdering processen som helhed komme til at strække sig over tre år. Udarbejdelse af strategisk miljøvurdering rapporten sker i tre faser og strækker sig fra foråret 2007 til foråret 2009. I en periode derefter skal der ske en monitering (overvågning) på baggrund af de anbefalinger, som fremgår af strategisk miljøvurdering rapporten.

Af strategisk miljøvurdering arbejdsgruppens kommissorium fremgik det endvidere, at den kommende strategiske miljøvurdering skulle struktureres på baggrund af den eksisterende lovgivning om strategisk miljøvurdering i Danmark, fordi der endnu ikke var lavet en særskilt lovgivning for strategisk miljøvurdering i Grønland. De danske bestemmelser, der er fra 2004, baserer sig på EU's strategiske miljøvurdering Direktiv fra 2004 (SMV, 2007).

Det første udkast til strategisk miljøvurderingen (SMV 2007) kom i intern høring i november 2007.

I forlængelse af den interne høring opstod der diskussion om, hvorvidt strategisk miljøvurderingen skulle indgå som en del af det samlede materiale/beslutningsoplæg, som Greenland Development havde ansvaret

Udskibning fra Nalunaq Goldmine. Der er foretaget miljøvurderinger af de tre aktive miner, der er aktive i Grønland i dag.
(FOTO: RC-Entreprenørservice)

Qorlortorsuaq Vandkraftværk er et af de få store projekter i Grønland, som der er udarbejdet en miljøvurdering for forud for etableringen.
(FOTO: RC-Entreprenørservice)

for eller, om den strategiske miljøvurderingen skulle behandles individuelt af politikerne som et særskilt beslutningsgrundlag. Nogle embedsfolk udtrykte bekymring for, om politikerne ville læse den lange strategisk miljøvurdering rapport og mente, at der i stedet skulle fremlægges en mere enkel samlet oversigt på baggrund af alle oplysningerne, så det kun var de konklusioner, som peger på problemer eller andre væsentlige delelementer, der skulle trækkes frem i et fælles dokument sammen med de øvrige tekniske og økonomiske vurderinger i relation til aluminiumsprojektet. Andre embedsfolk mente, at det ville være problematisk, at der ved at udarbejde et samlet beslutningsgrundlag ikke blev mulighed for politisk stillingtagen til enkeltaspekter for aluminiumsprojektet. Ved behandlingen af "Redegørelse om energiintensiv Industri i Grønland" var der ikke afholdt afstemning om, hvorvidt projektet skulle fortsætte eller ej, og ved behandlingen af Finanslovsforslag 2008 ville beslutningsgrundlaget ved en model med et fælles beslutningsgrundlag blive en samlet pakke, som Landsstyre og Landsting skulle forholde sig til på én gang. Der var bekymring for, om dette ville drukne enkelt elementerne i beslutningsgrundlaget, så der ikke ville være reel mulighed for at godkende eller afvise disse. Debatten endte med at administrativ koordineringsgruppe besluttede at lade Direktoratet for Natur og Miljø få ansvaret for et ekstrakt af strategisk miljø-

Det er vigtigt at foretage miljøvurderinger i forbindelse med opførelse af miner i Grønland – sådan som det også er sket i forbindelse med Nalunaq Goldmine.
Foto: RC-Entreprenørservice)

vurderingen, som skulle indgå som en del af det samlede beslutningsgrundlag.

Den 10. december 2007 kom strategisk miljøvurdering 2007 rapporten i offentlig høring.

5.3 Offentlighed og inddragelse

Den offentlige høring omkring strategisk miljøvurdering rapporten varede i perioden fra den 10. december 2007 til den 15. januar 2008. I forbindelse med høringen afholdt strategisk miljøvurdering arbejdsgruppen og de berørte kommuner blandt andet borgermøder om den strategiske miljøvurdering. Møderne blev holdt i de tre byer, der på det tidspunkt var kandidater til at huse smelteren. Ved borgermøderne blev der præsenteret fakta om de identificerede konsekvenser, som eksempelvis vandkraftplanerne i tilknytning til projektet og konsekvenserne heraf. Det var et af de emner, som flere fremmødte viste særlig stor interesse for, da mange familier i generationer har brugt områderne til jagt, bærplukning og rekreative formål. Ved de offentlige møder bidrog flere deltagere med egne erfaringer og viden til fagfolkenes forståelse af områdernes dyreliv og historie, og var dermed med til at understrege borgermødernes dobbelte formål – oplysning og dialog.

I forbindelse med den offentlige høring af strategisk miljøvurdering rapporten modtog Hjemmestyret mange høringssvar. Høringssvarene viste en generel stor interesse

for miljøvurderingen, rapporten og Alcoa-programmet som helhed. De bar klart præg af de værdier, der kendetegner de enkelte institutioner og interesseorganisationer som bidrog, men kendetegnet ved de mange høringssvar var, at de var lange og engagerede, både de negative og de positive høringssvar. Der blev rejst mange kritiske spørgsmål både til rapporten og til vurderingerne, men også mange roste Hjemmestyret for at have taget initiativ til udarbejdelse af en strategisk miljøvurdering.

5.4 Miljørapporten, beslutningsgrundlaget og det videre arbejde

Den strategiske miljøvurdering peger ikke på, at vandkraft- og aluminiumsprojektet vil forårsage uacceptable, irreversible skadevirkninger på naturen. Dette til trods for, at der, især i forbindelse med vandkraftanlæggene, vil blive tale om meget omfattende anlæg. Der peges dog også på, at de undersøgelser, der er foretaget indtil nu, ikke er tilstrækkelige til en endegyldig miljøvurdering af projektet. Derfor skal den strategiske miljøvurdering følges op i 2008-2009 af mere detaljerede miljøkonsekvensvurderinger og arkæologiske undersøgelser. Disse undersøgelser skal danne grundlag for projektets nødvendige myndighedsgodkendelser.

I beslutningsoplægget til Landsstyret stod der: "Strategisk miljøvurderingen har ikke lokaliseret nogen egentlig showstopper. Opsamling af eksisterende basisviden, vurdering af fordele og ulemper ved forskellige placeringer samt registrering af viden om, hvad vi ikke ved, bliver gennemgået for de fem områder. Anbefaling af forslag til nye tiltag for at skaffe nødvendig ny viden er samlet i et afsluttende kapitel" (Grønlands Hjemmestyre, 2008).

Når det mere præcist er fastlagt, hvor smelteren skal placeres og, hvordan vandkraftanlæggene skal designes, vil man gå i gang med vurderinger af virkninger på miljøet undersøgelserne, som vil blive langt mere detaljerede end de gennemførte strategisk miljøvurdering undersøgelser. I en vurdering af virkninger på miljøet fokuseres direkte på de områder, der vil blive berørt af vandkraftværker, dæmninger, transmissionsledninger, smelter, havn m.m.

Endvidere skal der foretages et såkaldt "bæredygtigheds initiativ". Denne opgave vil blive varetaget af Greenland Development i samarbejde med Alcoa. Formålet med bæredygtighedsstudiet er at inddrage interessenter i projektet.

6.0 Strategisk miljøvurdering og industri i fremtiden

Strategisk miljøvurdering processen er efterhånden godt i gang og foregår efter hensigten sideløbende med beslutningsprocessen vedrørende Alcoas henvendelse med ønske om placering af en aluminiumssmelter i Grønland. Det foreløbige resultat af den strategiske miljøvurdering er dels en håndgribelig miljørapport, dels en debat og bevågenhed i samfundet samt i høj grad en ny erfaring i tværsektorielt samarbejde i Hjemmestyret. Endelig har udarbejdelsen af den strategiske miljøvurdering været med til at rejse spørgsmålet om hvilke miljøvurderinger, der skal kræves udarbejdet i fremtiden, hvem der skal udarbejde dem, og hvilken rolle de skal spille i beslutningsprocesser i tilknytning til megaprojekter fremover.

Den strategisk miljøvurdering er den første af sin slags. Forstået på den måde, at det er den første miljøvurdering af et megaindustriprojekt i Grønland som ikke vedrører mineraludvinding eller olieefterforskning. Det er også den første strategiske miljøvurdering, som er udarbejdet af de grønlandske myndigheder. Ved udarbejdelsen af en strategisk miljøvurdering som en del af det samlede beslutningsgrundlag er der blevet introduceret et nyt niveau for miljøvurderinger i Grønland samtidigt med, at processen omkring udarbejdelsen og diskussionen om, hvad miljøvurderingen skulle bruges til og hvornår, har stillet nye udfordringer til ad-

I de fleste tilfælde placeres et råstofprojekt ikke i nærheden af eksisterende bebyggelse. I forbindelse med Alcoa-projektet er det dog besluttet, at aluminiumsprojektet skal opføres i nærheden af en eksisterende by. (Foto: RC-Entreprenørservice)

ministrationen af Alcoa projektet, og måske vil arbejdet komme til at danne præcedens i forhold til kommende erhvervsprojekter.

Derfor er det også vigtigt at være bevidst om og lære af de foreløbige erfaringer, for hvad var det egentlig for nogle styrker og svagheder, man stødte på undervejs? Vi vil her pege på to ting.

For det første er aluminiumsprojektet ikke omfattet af de særlige ordninger, som findes på råstofområdet. I modsætning til råstofområdet, har natur og miljøforvaltningen ikke retningslinier for håndtering af store industriprojekter. Den administrative behandling af aluminiumsprojektet har derfor været kendetegnet ved løbende justeringer, og det har på mange måder påvirket processen frem til nu. I tilknytning til fremtidige industriprojekter vil det være en fordel på forhånd at opnå enighed om formål og anvendelse af strategisk miljøvurdering som et redskab. Klare retningslinjer for indhold og opsætning af en strategisk miljøvurdering vil ligeledes gøre arbejdet mere tilgængeligt. En fornuftig ide kan således være at udarbejde regelsæt indenfor natur og miljøreguleringen, der klart definerer, hvordan en henvendelse fra en industrigigant skal behandles i forhold til miljøspørgsmål, hvem der har ansvaret for udarbejdelse af miljøvurderinger, hvad de skal indeholde som minimum, og hvad de skal bruges til og ikke mindst, hvem der har tilsyn/opfølgningspligt.

Den anden erfaring, som vi har valgt at trække frem her i forbindelse med den strategiske miljøvurdering, handler om det tværfaglige samarbejde og den offentlige deltagelse. På trods af manglende retningslinjer og travlhed med andre opgaver bidrog direktoraternes egne eksperter i forhold til

Mega industry and climate change in Greenland – a need for strategic environmental assessment at a higher level

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Abstract
Greenland is a former colony, heading for independence. Two requisites for gaining independence are growth and economic sustainability. Therefore, a progressive policy furthering development and attraction of mega-scale industries is pursued. Existing accessible mineral deposits are localised and a range of new projects such as mining, aluminium production and petrol exploration are likely to be implemented within the next few years. Due to climate change, which causes reduction of the ice cap, yet unidentified deposits are expected to be accessed and further exploited in the future. How these mega-scale industrial projects will influence and impact on the vulnerable arctic environment and Greenlandic society is yet unknown, as the use of strategic environmental assessments in Greenland is only at its early stages.

Based on a documentary study, the paper presents a review of the environmental assessments conducted in relation to former and actual projects, programmes and plans in Greenland. The authors analyse the strategic level of the assessments made as well as their scope in terms of the parameters included. It is concluded that the current industrial development in Greenland along with climate change require strategic environmental assessment at a higher level, covering the policy and plans of decision-making and a broader concept of environment than the one applied in the cases presented.

Keywords: Strategic Environmental Assessment, Climate change, Mega Industry, Mining.

1. Introduction – mega industry and climate change challenge Greenland
This paper presents an analysis of the strategic level and the scope of the environmental assessments made of former and actual projects, programmes and plans in Greenland.

Greenland is a former Danish colony. Since 1979, Greenland has had an individual government, the so-called "Home Rule", but it still forms part of and receives financial subsidies from the Danish State. In the last few years, the Greenlandic Home Rule has worked dedicatedly towards gaining independence and becoming an individual state. To gain independence, development and economical growth are required and Greenland is determined to reach this aim. To establish economic sustainability, a progressive policy aiming at attracting mega-scale industries is now being carried out, and Greenland has the potential for significant economic development (Greenland Home Rule, 2007). Existing accessible mineral deposits are localised and a range of new projects such as mining, aluminium production and petrol exploration are likely to be implemented within the next few years (Bureau of Minerals and Petrol, 2008; Greenland Development, 2008). Due to global warming, which causes reduction of the ice cap, yet unidentified deposits are expected to be accessed and further exploited in the future. The impact of these mega-scale industrial projects on the vulnerable arctic environment and Greenlandic society is yet unknown, as the use of strategic environmental assessments in Greenland is only at its early stages.

This paper describes how Greenland can benefit from an extended use of Strategic Environmental Assessment (SEA) at a higher level. Firstly, section two presents the definitions applied as a framework for the analysis of environmental assessments undertaken today in Greenland. In section three, the research approach including case selection is defined. The results of the analysis are presented in sections four and five. Finally, the paper discusses and concludes on the results in section six.

2. The need for an appropriate level of SEA and a broad concept of environment

Due to its mega industry, Greenland has the potential for significant economic development. In this context, the role of Strategic Environmental Assessment is, in a proactive approach, to inform decision-makers and the public about the sustainability of the decisions to be made. This involves raising the right issues and alternatives at the right tiers of strategic decision-making, covering policies, plans and programmes. Policies, plans and programmes are tiered and, in theory, higher-level SEAs define the context of lower-level SEAs (Thérivel and Partidário, 1996). Despite the experience that securing right level SEAs and tiering is not a single top-down process, due to e.g. time lags between different tiers (Fisher, 2007, 2003; Arts et al., 2005), it is necessary to ensure that sufficient information exists at all levels to provide the basis for robust and sustainable decisions. The analysis of the levels of environmental assessment undertaken in Greenland will be based on the definitions provided in table 1.

Tier	*Definition*	*Main question raised in the SEA*	*Focus in the SEA*
Policy	Inspiration and guidance for action	Why action?	- Need, objectives and principles of new action
		What actions?	- Selection of best methods and the capacity needed for each method
Plan	Set of co-ordinated and timed objectives for the implementation of the policy	What actions?	
		Where actions?	- Location of alternatives
Programme	Set of projects in a particular area	Where actions?	
		When actions?	- Implementation
Project	Development project	How actions?	- Design of projects

Table 1. Tiers of decision-making and the role of SEA ('Definitions' used are based on Wood and Djeddour, 1991, and 'questions' and 'focus in the SEA' are based on Fisher, 2007 and Verheem, 2000).

Besides securing an appropriate level of SEAs, there is a need for assessments based on a broad concept of environment to ensure a balance of different environmental parameters and avoid trade-offs. The concept of environment applied to the analysis is the one defined in the European SEA Directive, covering the parameters of biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between these factors (European Commission, 2001).

3. Research approach and cases

In this paper, the authors analyse both the strategic level of the assessments undertaken and their scope in terms of the parameters included. The analysis is based on a review of selected environmental assessments of mega projects in Greenland. Mega projects are defined as the most expensive projects in terms of infrastructure and investment in the world today, with typical cost from one hundred million dollars to billions of dollars (Bent Flyvbjerg, 2007).

In order to represent the wide scope of the assessments undertaken, the selection of cases included in the analysis is based on the following three principles, in coincidental order:

- *Prioritising environmental assessments which are officially described as and/or named EIA or SEA.*
- *Prioritising environmental assessments of industrial mega projects.*
- *Prioritising environmental assessments which are the only ones of their kind or typical for a group of assessments of projects which include the same or similar parameters.*

The cases, selected from 3 SEAs and 6 EIAs of industrial development projects in Greenland, are:

1. *Aluminium production, Alcoa, SEA (GHR, 2008)*
   This assessment is the most comprehensive environmental assessment carried out in Greenland. The assessment includes six alternative localizations of aluminium production and associated constructions such as hydroelectric plants, transmission lines, roads, buildings and port. This assessment is made by the Greenlandic Home Rule. The assessment is primarily based on existing knowledge and points out potential significant environmental impacts from implementing the programme, including both the production facility and related projects.

2. *Minerals and petrol exploration, a preliminary strategic environmental impact assessment of minerals and hydrocarbon activities on the Nuusuaq peninsula, West Greenland (DMU, 2008)*
   This assessment is the first in Greenland to investigate the sustainable capacity of nature in a larger area, in this case the Nuussuaq Peninsula. The assessment is made by the Danish National Environmental Research Institute on behalf of the Bureau of Minerals and Petroleum, Greenland Home Rule. The environmental assessment focuses on activities such as mineral and hydrocarbon exploration on the Nuussuaq peninsula. The assessment is based on existing knowledge and points out the data yet to be collected in order to provide a complete overview of the area.

3. *Qorlortorsuaq hydroelectric plant,Environmental report (Niras, 2005)*
   Two environmental assessments have been made of mega hydroelectric plants in Greenland. Case 3 is chosen as an example of this assessment. The background for the project is the decision to replace Greenland's petrol-based power and heat supply with an energy production which is independent from import and has a less negative impact on the environment. The environmental impact assessment includes: dam construction, hydroelectric plant, and transmission line and transformer stations. The assessment formed part of the application from the developer to the Bureau of Buildings and Infrastructure, Greenland Home Rule, and was included in order to obtain the permissions required to execute the project. The assessment is based on existing materials and common knowledge. The assessment evaluates three alternative locations of the transmission line. The assessment points out possible environmental impacts of the project in the construction phase and during operation.

4. *Goldmine, Nalunaq Gold Project, Environmental Impact Assessment, 2002, prepared for Nalunaq I/S (SRK Consulting, 2002)*
   Four environmental assessments have been made of specific mining projects in Greenland. The EIA of the Nalunaq Goldmine in Southwest Greenland is chosen as an example of this type of environmental assessment. The environmental impact assessment has been carried out by consultants on behalf of the mining company. EIAs of mineral activities comprise a set of legally required parameters clarified through three years of base-line studies on the location (Bureau of Minerals and Petrol, 2007).

4. Strategic level in today's assessment practice in Greenland

Based on a documentary study of the environmental reports, the strategic level of the four cases is defined as follows; one takes place at the project level, two at the programme level and one at the plan level, as visualized in table 2.

	Case 1	Case 2	Case 3	Case 4
Policy SEA				
Plan SEA		•		
Programme SEA	•		•	
EIA				•
Focus of the assessment	Impacts of alternative locations Cumulative impacts of projects	Regional capacity and sustainability	Impacts of projects Impacts of alternative locations	Impacts of project

Table 2. Strategic level of the assessments of the four cases (Definition described in Section 2).

As shown in table 2, none of the environmental assessments takes place at the policy level of the scale. Furthermore, cases 1 and 2 are the only ones of their type in Greenland today, and they are also the only ones concerned with mega industry in Greenland.

While the policy level is not represented in the assessments and plan level SEA is very sparsely undertaken, it is clear that the consideration of cumulative effects of multiple actions is limited. The summarized activities in Greenland are thereby not visible to the authorities, decision-makers or the public when processing cases and applications related to new mega projects. The sustainability of the projects and the long-term consequences of permitting more projects are not visible to the decision-makers.

5. The concept of environment used in the assessments

The review of the four cases shows a variation in the scope of parameters included and the depth by which they are assessed in the reports. It is apparent that there is a lack of joint legal requirements to environmental assessments carried out in Greenland, as no common concept can be found in the assessments made. Also, the contents of the assessments with regard to the parameters included are diverse. The parameters included are shown in table 3.

Environmental parameter	Case 1	Case 2	Case 3	Case 4
Biodiversity				
Fauna/Flora	√	√	√	√
Soil		√		
Water		√		√
Air		√	√	√
Population	√			
Human health	√	√		√
Climatic factors	√	√		
Material assets	√			
Cultural heritage	√		√	
Landscape		√	√	√
Interrelationship	√			

Table 3. Parameters included in the cases.

The differences in both the parameters included and in the contents of the parameters make it hard, if not impossible, to compare the assessments and to identify the cumulative effects of the aggregated mega projects. In the assessments, no argumentation is presented which explains the parameters not included, and therefore, it seems coincidental which impacts are identified as being significant to each case.

6. Conclusion and discussion

The policy level is not yet included in strategic environmental assessments in Greenland. One single assessment has been made at the plan level, two at the programme level and six at the project level. Some of the assessments are very detailed, but still, they only contain some of the parameters relevant for strategic assessment. The situation in Greenland today with an aggressive policy aiming at attracting mega industry projects combined with the vulnerable arctic climate and the global warming causing ice cap reductions, makes it is highly relevant to take the environmental assessments to a higher level.

Because of Greenland's significant development potential, there is a present need for considerations at the policy and plan levels with regard to the environment. The types of questions which need to be raised in this respect are shown in table 4, which also points to the need for assessing alternatives and their impacts in terms of needs and capacities. The extension and the types of industries which can settle without significant negative and irreversible consequences for the Greenlandic environment and the effect which this will have on other policy areas, like e.g. labour and commerce, must be defined. This discussion has still not taken place and decisions in this respect are yet to be made. The current industrial development in Greenland along

with climate change require strategic environmental assessment at a higher level, covering the policy and plan levels of decision-making and a broader concept of environment.

Tier	*Type of questions which needs to be raised*	*Basis for alternative assessment*
Policy	Whether or not to promote the development of mega industry in Greenland?	Societal development needs
Plan	The extent to which mega industrial development must take place in Greenland?	Societal capacity
Programme	Where to locate the industrial development in Greenland?	Regional and local capacity

Table 4 Higher level SEA required in the case of mega industry in Greenland.

Without strategic considerations on the environmental sustainability of Greenland, the interrelationship between activities will not be visible and the basis for decision-making will be insufficient.

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Værdiportrætter i en tid med industriudvikling og klimaforandringer

Grønland i forandring

Med Selvstyrets indførelse den 21. juni 2009 blev et nyt skridt taget i retning af grønlandsk selvstændighed. I Selvstyreaftalen mellem Grønland og Danmark er det tydeliggjort, at en forudsætning for et fremtidigt selvstændigt Grønland er øget økonomisk selvbærenhed (Selvstyrelov, 2009). Der er således skabt en motivation for udbygning af industrien. Samtidig motiveres industriudvikling yderligere af et behov for at skabe arbejdspladser til udsatte erhvervsgrupper. Som eksempel herpå nævnes ofte de traditionelle fangerhverv. Fokus er i den forbindelse på minedrift, olieudvinding og aluminiumsproduktion, som alle er aktuelle megaindustrier. Global opvarmning med højere temperaturer forårsager reduktion af indlandsisen (Kerr, 2007) og forbedrer derved adgangen til mineralske ressourcer, og reduktionen af ismassen sker i et hurtigere tempo end forudset (ved modeller indtil nu) og forårsager tilbagetrækning af iskappen i Grønland (Aoalgeirsdóttir, 2008). Iskappens tilbagetrækning betyder, at endnu uidentifi-

RESUMÉ

Resume: Grønland er i hastig udvikling. Der er i dag stor fokus på industriudvikling og økonomisk selvbærenhed. Samtidig er der et politisk ønske om, at industriudviklingen skal foregå på en forsvarlig måde set fra et miljømæssigt og socialt perspektiv. Men hvordan sikrer man, at befolkningens almene interesser varetages i den politiske beslutningsarena, når der skal tages stilling til de store industriprojekter? I denne artikel tegnes et billede af, hvordan almindelige borgere opfatter og oplever udviklingstendenserne i deres hverdag. På baggrund af personlige værdiportrætter af helt almindelige mennesker diskuteres de fælles forankrede værdier i det grønlandske samfund og kultur i forhold til udviklingen.

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cerede mineral- og olieforekomster forventes at blive tilgængelige for udnyttelse i fremtiden. På Black Angel Mining A/S hjemmeside kunne man tidligere læse at: "Den mest spektakulære opdagelse i 2005 var, da en enorm forekomst af massiv sulfid blev afsløret ved tilbagetrækningen af en gletscher. Eksistensen af mineralforekomsten på dette sted var kendt, men tidligere omsluttet af en 60 m tyk iskappe" (Angus & Ross, 2008).

Minedrift, olieindvinding og aluminiumsproduktion er megaindustrier, der alle har potentialet for at medføre nye arbejdspladser og langsigtede indtægter til det Grønlandske samfund. Selvstyret har således også som noget af det første igangsat hjemtagelse af det tidligere fælles dansk/grønlandske råstofområde. (Merrild og Kørnøv, 2009; Selvstyrelov, 2009)

Samtidig med, at der er et politisk ønske om industriudvikling, så stilles der også krav til, at udviklingen skal foregå på en forsvarlig måde set fra et miljømæssigt og socialt perspektiv. Dette kommer til udtryk i erklæringer både fra medlemmer af Naalakersuisut (regeringen), NGO'er som Narsaq Earth Charter og interesseorganisationer som Grønlands Arbejdsgiverforening. Der arbejdes endvidere pt. på at indføre nye miljøkrav på lovgivningsniveau med henblik på at kunne stille krav om miljøvurdering (VVM) af nye store industriprojekter. Grønland er således i hastig udvikling både på det organisatoriske område via lovgivningsreformer og via implementering af nye megaindustrier. (Merrild & Kørnøv, 2009)

Den menneskelige bekymring

For at få input til den igangværende dialog om Grønlands udvikling har vi valgt at undersøge en gruppe menneskers opfattelse af samfundsmæssige værdier i relation til udviklingen. Undersøgelsen er baseret på i alt 13 personlige værdiportrætter udført på baggrund af samtaler med personer i forskellige aldre og af begge køn. Alle samtalerne er gennemført i deltagernes egne sfærer, i hjemmet eller på arbejdspladsen, og på nær en enkelt er alle gennemført på deltagernes modersmål, grønlandsk. Blandt deltagerne er syv kvinder og fire mænd, der spænder aldersmæssigt fra 14 år til 86 år.

Begrebet "værdi" kommer oprindeligt af det latinske udtryk at valere, der betyder at have styrke. Værdibegrebet er et grundbegreb indenfor samfundsvidenskaben og filosofien og knytter sig til opfattelsen af, hvad der er godt. Det kan knytte sig til den enkeltes opfattelse af materielle goder, hvor én ting kan have større værdi end en anden, men det kan også knytte sig til persongruppers opfattelse af, hvad der er «det gode samfund». Og det er i denne sidstnævnte betydning værdiportrætterne er udført. De portrætterede er alle blevet stillet de samme fire simple værdirationelle spørgsmål, baseret på en metode ved den danske samfundsforsker Bent Flyvbjerg (Flyvbjerg, 2009).

1. **Hvor er Grønland på vej hen?**
2. **Er det ønskeligt?**
3. **Hvad bør der gøres?**
4. **Hvem vinder og hvem taber i udviklingen?**

Et vigtigt argument for at vælge denne tilgang er den særlige situation og kontekst i Grønland med industriudvikling og klimaforandringer. Der findes ikke endelige, objektive svar på spørgsmålene, og svarene knytter sig således til de personlige værdiopfattelser. Når værdiopfattelser er fælles for befolkningsgrupper, så er de at betragte som samfundsmæssige værdier.

I det følgende præsenteres fire af værdiportrætterne, som eksempler og herefter beskrives det billede, der tegnes af de samlede værdiportrætter.

Navn: **Evannguaq Sandgreen**
Alder: **26 år**
Fødeby: **Qeqertarsuaq**
Nuværende bopæl: **Qeqertarsuaq**
Profession: **Elev ved Piareersarfik**

Hvor er Grønland på vej hen?

Naturen betyder meget for mig. Min kæreste er fanger, og når han tager mig med ud at sejle i hans båd, så gør det mig meget glad. Jeg elsker at fiske og gå på jagt. Ude i naturen føler vi, hvordan vejret forandrer sig med varmere somre og kraftigere og flere storme i disse år. I dag er vejret rigtigt godt. Det ville være dejligt at tage ud at sejle og fiske, men jeg er lige begyndt på Piareersarfik (forberedelsesskole) i mandags, så jeg kan ikke blive væk fra undervisningen.

Grønland ændrer sig i disse år. Meget mere vil forandres i løbet af de næste halvtreds år. Mit håb er, at det bliver en god udvikling for alle. Vi mennesker er gode til at tilpasse os forandringer. Teknologien udvikles også meget, og der er mere forurening end tidligere. Jeg tror, at vi mennesker påvirker naturen via vores handlinger. Når vi mennesker skaber emissioner og smider affald i naturen, så påvirker vi naturens balance.

Er det ønskeligt?

»Asuki«: Det ved jeg ikke. Det er et problem, at isen forsvinder, og at vejret bliver varmere. Vi kan ikke stole på vores erfaringer og viden om naturen og de naturlige dyrearter.

Verden udvikler sig hele tiden. Det gælder også Grønland og udviklingen kan bidrage med noget positivt. Vi har brug for flere jobs. Mangel på arbejdspladser i de mindre byer medfører en situation, hvor folk tvinges til at flytte, selvom de ikke har lyst til det. Derfor er industriudviklingen positiv, hvis den medfører flere jobs i de små byer.

Hvad skal der gøres?

Vi skal have isen tilbage [ler]. Der skulle være flere arbejdspladser her og flere uddannelsesmuligheder og institutioner. Jeg vil eksempelvis gerne være tøjdesigner, men jeg har ingen mulighed for at uddanne mig til tøjdesigner her i nærheden. Jeg laver mange kreative ting, broderer, tegner og maler og sælger nogen gange det, jeg laver, men det er ikke så organiseret, fordi jeg ikke er uddannet. Mange uddannelser kræver, at man kan tale dansk. Jeg er ikke så god til dansk, men nu er jeg lige startet på et kursus. Vi burde også være bedre til at beskytte miljøet: landet (nuna) og klimaet/vejret (silarlu).

Hvem vinder og hvem taber?

Vi vinder alle på udviklingen, hvis den sker på en hensigtsmæssig måde. Det vigtigste for mig er vores jordklode og vores natur. Hvis vi mister adgangen til naturen, så mister vi alt. Som menneske finder jeg miljøet og omgivelserne helt essentielle for trivsel og velfærd.

Navn: **Adam Møller**
Alder: **82 år**
Fødeby: **Qeqertarsuaq**
Nuværende bopæl: **Qeqertarsuaq plejehjem**
Profession: **Pensionist**

Hvor er Grønland på vej hen?

Mange unge mennesker flytter fra Qeqertarsuaq nu. De samles i de store byer eller flytter til Danmark og bosætter sig der.

Da jeg var yngre arbejdede jeg for en lokal entreprenør som arbejdsmand. Jeg har også arbejdet med radiomekanik. Jeg har ingen videregående uddannelse. Jeg gik i folkeskolen her i Qeqertarsuaq, men har også været på kursus i radiomekanik i Danmark. Kurset foregik et sted i nærheden af Rebild i 1966. Min søster har giftet sig med en dansk mand. De bor i Danmark. Mine to børn er også flyttet til Danmark, efter de er blevet voksne. Jeg besøgte dem for nogle år siden. Jeg kan ikke tale dansk, men det kunne jeg tidligere, dengang jeg var på kursus i Danmark, blev vi undervist på dansk. Jeg holder meget af at lytte til musik og se film. Jeg kan godt lide actionfilm; Jean Claude Van Damme er en af mine yndlingsskuespillere.

Fra mit værelse har jeg en dejlig udsigt. Engang plejede der at være sne på bjergene i Qeqertarsuaq på dette tidspunkt af året. Sneen kommer senere nu. Der falder ikke sne, før det bliver koldere på bjergtoppene, og det sker ikke, før det er blevet koldere i vejret. Der er heller ikke meget is i fjorden, men det er fordi, der har været storm for nylig.

Er det ønskeligt?

Jeg tænker ikke meget over, hvorfor tingene ændrer sig. Det er bare sådan, det er. Jeg synes, at det er okay, at folk rejser for at forfølge deres muligheder.

Hvad skal der gøres?

Måske der skulle skabes flere jobs, og der skulle være flere muligheder og mere at lave for de unge mennesker i Grønland, så det bliver mere attraktivt at blive her og bidrage til samfundet.

Hvem vinder og hvem taber?

Jeg tror, at fremtiden for Grønland tegner godt for den uddannede del af befolkningen. Men dem, der ikke kan få jobs her, de vælger at flytte til andre steder, og på den måde mister vi en del af vores befolkningsgrundlag.

Navn: **Nuka Pavia Wille**
Alder: **50 år**
Fødested: **Kangerluk**
Nuværende bopæl: **Kangerluk**
Profession: **Husflidskunstner**

Hvor er vi på vej hen?

Vejret er noget, vi taler meget om i bygden. Det er meget vigtigt i hverdagen, blandt andet påvirker vejret transport mellem Qeqertarsuaq (den nærmeste by) og Kangerluk. Hvis vejret er dårligt, er det ikke muligt at sejle, og hvis det er varmt, er isen ikke god til at køre hundeslæde på. Indlandsisen trækker sig dramatisk tilbage i dette område. Gletsjerne er også blevet meget mindre. For bare fem år siden gik gletscherne helt ned til fjorden, men nu er de meget små og stopper helt oppe i fjeldet. Det er på grund af ændringerne af indlandsisen, at vejret bliver varmere. Mine bedsteforældre og min far fortalte mig, at dengang min far var barn, kunne man tage til Ilulissat over fjorden på hundeslæde om vinteren. Isen var over 1 m tyk dengang. Det er helt umuligt nu, da isen ikke bliver tykkere end 26 cm. Omkring år 1900 var der rensdyr her ved vores bygd, Kangerluk. Der er ikke nogen dyr længere. Der må have været mange rensdyr, fordi jeg fandt en masse gamle knogler med bidemærker.

Er det ønskeligt?

Jeg bor sammen med min kone her i Kangerluk. Jeg blev født her. Mine forældre og bedsteforældre blev også født her. Jeg har fire børn. Kun én har valgt at blive boende her i Kangerluk, de andre er flyttet væk for at få job i de større byer. Min yngste er 15 år gammel, det er en søn. Han studerer i Norge. Jeg er meget stolt af ham. Ingen tvivl om, at jeg savner ham, men det er godt for ham at være i Norge. Jeg har ikke penge til at besøge ham, eller købe ham en billet, så han kan komme hjem på ferie.

I Grønland er vi klar over, at naturen ændrer sig hele tiden. I gamle dage var Inuitfolket nomader og ville rejse fra sted til sted afhængigt af ændringer i vejret og fangstdyr. Det fortælles i gamle sagn, hvordan Inuit altid har vidst, at mennesket og naturen påvirker hinanden.

Det kan være problematisk, når tingene ændrer sig, men du tilpasser dig til ændringerne. Du ved aldrig, hvornår naturen ændrer sig igen. Det er ikke noget du ønsker, men det er heller ikke noget, du forsøger at ændre.

Hvad skal der gøres?

Folk flytter fra bygden. De elsker dette sted, men der er ikke længere fisk nok at fange. Tilbage i halvtredserne var der 100 indbyggere her. Nu er der kun 34 mennesker tilbage i bygden. De bor i 14 af husene. Resten står tomme. Jeg synes det er trist.

Det er svært at sige, hvad der bør gøres. Du kan ikke sige præcist, hvorfor vejret er skiftende. Naturen er meget kompleks. Hvornår vil fisken vende tilbage og skabe nye arbejdspladser?

Jeg har været på kursus i Danmark for at blive uddannet i at bruge nogle enkle maskiner til fremstilling af kunsthåndværk. Jeg taler ikke dansk, men kommunen sørgede for, at der var en tolk med, der kunne oversætte for mig. Det var en god ting, fordi jeg kan forsørge mig selv ved at sælge kunsthåndværk til turisterne, og det gør det muligt for mig at blive boende her i Kangerluk. Det ville være godt, hvis det var muligt at skabe flere nye arbejdspladser på den måde.

Hvem vinder og hvem taber?

De mennesker, der bor i bygderne taber, hvis udviklingen ikke ændrer sig.

Navn: **Augusta Salling**
Alder: **55 år**
Fødeby: **Narsaq**
Nuværende bopæl: **Qeqertarsuaq**
Profession: **Ejer og direktør i privat turisme selskab.**

Hvor er vi på vej hen?

Grønland er ikke et udviklingsland set fra et velfærdsperspektiv. Vi har en høj levestandard. Vores fiskerflåde og produktionssystem er meget udviklet. Men set i lyset af de industrielle potentialer, der endnu ikke er udnyttet, så er Grønland endnu ikke udviklet som et I land. Udvikling af miner og oliefelter i Grønland kunne være til gavn for både Grønland og resten af verden. Derfor skal Grønland have CO2-kvoter for at blive i stand til at udvikles.

Halvtreds år fra nu vil vi have en masse flere og bedre uddannede unge end i dag. Uddannelsesniveauet i landet vil være betydeligt højere end nu. Det er sandsynligt, at vi vil leve mere koncentreret i færre byer, ikke så spredt som i dag. Men vi bør ikke samle os alt for meget. Vi skal stadig være i stand til at sprede os på kysten og derved bevare adgangen til ressourcer i alle områder. Vi er så få, at vi nemt kunne leve på ét sted. Men det ville være rigtig kedeligt.

Er det ønskeligt?

Man kan frygte konsekvenserne, hvis vi gennemfører alle de planlagte industrier med minedrift, olie- og aluminiumprojekter. Det vil kræve, at en masse mennesker fra andre lande flytter hertil og arbejder her. Vores lokale befolkning vil blive blandet med en masse forskellige nationaliteter, så det er svært at forestille sig, hvor det vil bringe os hen.

Hvad skal der gøres?

Jeg ser gerne en fortsat industriudvikling. Jeg tror, at udviklingen er god og nødvendig for at gøre Grønland mere økonomisk uafhængigt af Danmark. Men vi bør tænke nøje over, hvor mange projekter der skal gennemføres, og hvor de skal placeres. Ændringer i samfundet bør ikke ske for hurtigt. Det er vigtigt, at befolkningen er i stand til at tilpasse sig. Hvis udviklingen sker for hurtigt, vil borgerne ikke kunne nå at følge med. Grønlændere er generelt gode til at tilpasse sig, men vi har set eksempler, hvor udviklingen skete for hurtigt. Ligesom da folk blev tvunget til at flytte fra mineområdet ved Qullissat. Nogle af de mennesker kan stadig nu - 40 år senere - bryde sammen og græde, når de taler om, hvad der skete dengang. Vi bør lære af dette i fremtiden.

Det er også vigtigt, at vi beskytter miljøet. Folk skal tage ansvar for deres egne handlinger - fra det lille stykke affald smidt i naturen til større miljøspørgsmål i forbindelse med den industrielle udvikling. Jeg tror, at det er vigtigt, at folk bliver klar over, hvor de kan søge oplysninger om konsekvenserne af forskellige industrielle projekter. Kanalerne til information kan være svære at finde, hvis ikke man på forhånd ved, hvor man skal lede.

Hvem vinder og hvem taber?

Hvis vi er parate og åbne for forandringer, hvis vi lærer vores børn og børnebørn, at verden ikke står stille, men udvikler sig hele tiden, og at vi skal være åbne for at lære og tilpasse os, så kan vi alle blive vindere.

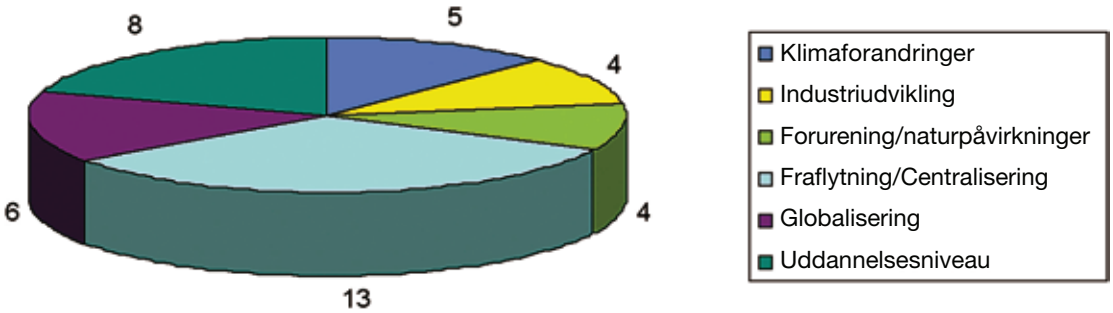
Værdier og udfordringer:

De 13 værdiportrætter peger på flere fælles problemområder og samfundsmæssige værdier. Som det også fremgår af de fire eksempler præsenteret her, så bringer personerne emner op, som bekymrer og glæder dem i forhold til de forandringer, de oplever i deres hverdag. Der er nogle gennemgående temaer i portrætterne. De emner, der fokuseres på er:

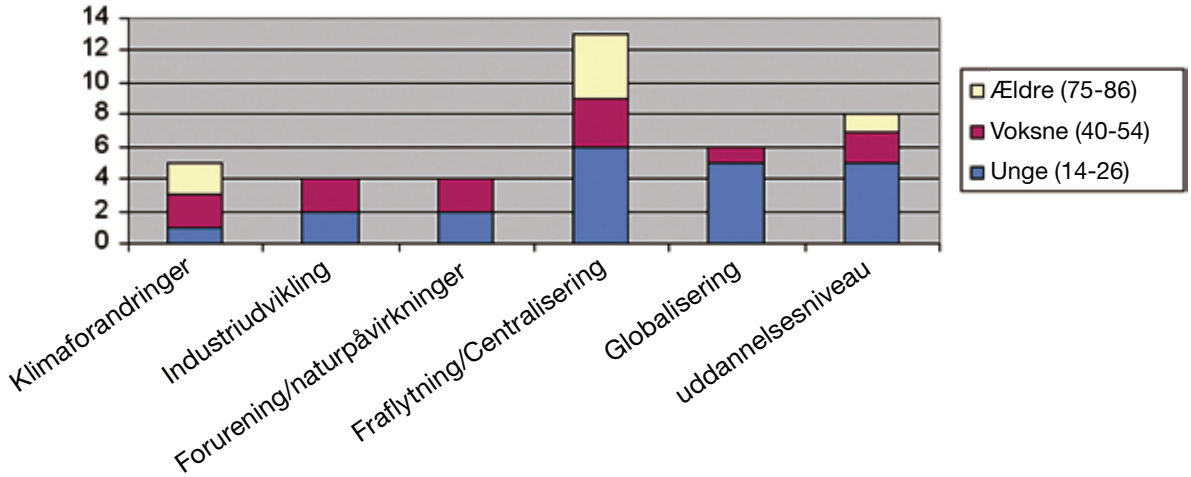
- vejret og klimaet der forandres
- industrien der vokser og ændrer karakter
- forurening og menneskeskabt forringelse af naturen
- centraliseringen - borgere der flytter fra de små bysamfund til de større eller til udlandet
- øget globalisering samt uddannelsesmuligheder og niveau

Der er bred enighed blandt deltagerne om, at disse meget forskellige typer af forandringer er dem, der er væsentlige i deres hverdag lige nu. Samtidig er deltagerne ramt af en vis ambivalens, idet ingen af forandringerne ses som entydigt negative eller positive. Således betragtes eksempelvis industriudvikling både som et middel til at skaffe ønskede arbejdspladser og forbedre Grønlands økonomi og dermed bidrage til et bedre samfund for alle, og som en trussel mod naturen, klimaet og mod befolkningens kulturelle værdier. Det er påfaldende, at hvert emne rejses af flere deltagere. Figur 1 viser antallet af personer, der har beskrevet de enkelte emner i samtalerne. Det fremgår at der specielt er ét emne, der berører alle, idet det indgår i samtlige portrætter, nemlig tendensen til at borgere flytter fra de små bysamfund ind til de større byer eller til udlandet.

Aldersmæssigt ses der en vis spredning på emnerne, som vist i figur 2. Også holdningen til det oftest rejste emne, fraflytning varierer efter alder. Mens de voksne og ældre primært finder fraflytning og centralisering problematisk, har de unge et andet perspektiv, idet de ser det at flytte fra et mindre samfund til et større som en mulighed og et individuelt valg, der foretages bevidst for at opnå bedre levebetingelser gennem uddannelse eller jobmuligheder. Det de portrætterede unge finder problematisk er i højere grad udfordringer, de møder i forhold til globalisering og uddannelse. Eksempelvis nævner alle de unge, at sprogkundskaber er en forudsætning for at uddanne sig både i Grønland og særligt i udlandet. De portrætterede føler ikke, at deres sproglige kvalifikationer fra folkeskolen er tilstrækkelige til at gennemføre en gymnasial eller videregående uddannelse. Da de samtidigt ser uddannelse som en forudsætning for at få "det gode job" og leve "det gode liv" i fremtidens Grønland, så placerer det dem i en situation, hvor sproglig opkvalificering er en nødvendighed. Således er det også påfaldende, at alle de portrætterede enten er i gang med



Figur 1. Emner som de portrætterede personer nævnte og angivelse af antal personer, der nævnte dem.



Figur 2. Aldersmæssig spredning og antal personer, der har rejst de forskellige emner. Der er i alt interviewet 6 unge, 3 voksne og 4 ældre.

sprogkurser eller har ønsker om at komme på højskoleophold eller på efterskole i Danmark. Her ser de voksne og ældre mere generelt på uddannelsesområdet og konstaterer, at det er positivt, at uddannelsesniveauet stiger.

Ses der på fordelingen af hvor mange mænd og kvinder, der har rejst de forskellige emner, så er der en ligelig fordeling på alle emner. Der er altså ikke tegn på en kønsbestemt variation i værdier.

Når de portrætterede forklarer, hvorfor de finder forandringerne problematiske, så giver de udtryk for, at de rejste emner truer nogle specifikke samfundsmæssige værdier, som de finder væsentlige. Man kan beskrive sammenhængen imellem værdi, trussel og løsningsmodel som et værdirationale, idet handlingen, der foreslås, er baseret på et ønske om at beskytte sine værdier og ikke udfra et ønske om at opnå et givet mål. De værdirationaler, som deltagerne beskriver i portrætterne, er skitseret i det følgende.

Erfaring, lokal viden og traditioner er en af de værdier, der kan identificeres. De deltagere, der nævnte klimaforandringer, som en aktuel problemstilling forklarede det problematiske med, at deres viden og erfaringer om vejret, jagt og fiskesteder sættes ud af kraft. En af de portrætterede ernærer sig som fisker, han forklarede, at han ikke længere kan fange fisk de steder, hvor der tidligere plejede at være mange, og at han nogle gange fanger fisk, som han ikke ved, hvad han kan bruge til, fordi han aldrig er stødt på eller har hørt om arten før. Der peges også på, at vejret har stor betydning i forhold til planlægning af transport mellem byerne.

På den anden side er der også en enighed blandt deltagerne om, at mennesket som art og grønlændere i særdeleshed tilpasser sig forandringerne, og at den nye viden bliver en del af den erfaring, som deres generation giver videre til de kommende. Løsningen, der peges på i tilknytning til klimaforandringer, er at skabe øget viden og bevidsthed om sammenhængen mellem menneskers handlinger og indflydelsen på miljøet.

Adgang til naturen og naturens ressourcer er en anden værdi, der kommer til udtryk i portrætterne. Der er en generel glæde og livskvalitet forbundet med den minimalt regulerede adgang til naturen og naturens

ressourcer. Det handler om muligheden for at samle bær, gå på fangst og samle materialer til kunsthåndværk, ligesom det handler om den mere åndelige tilfredsstillelse ved muligheden for at bevæge sig rundt i naturen. Værdien kommer til udtryk via de portrætteredes forklaringer på deres bekymring for, om den rene og uspolerede natur går tabt som et led i den nye industriudvikling. Der er også bekymring i forhold til forurening både fra industrien, men også fra borgerne selv, idet de konstaterer, at emballage og produkter nedbrydes langsomt og har stor indflydelse på både udseende og funktion af naturen. Som svar på spørgsmålet om, hvad der bør gøres, peges der af de adspurgte på, at der er behov for større viden og bevidsthed om menneskets indflydelse på naturen og på indførelse af miljøbeskyttelsessystemer i forbindelse med ny industri.

Små bysamfund Som tidligere nævnt er der ét emne, der dukker op flest gange - faktisk i alle portrætterne. Det er borgernes flytning fra de små bysamfund til de større byer og udlandet. Som nævnt er bekymringen aldersbetinget, men fælles er det, at det er noget de portrætterede påvirkes af i deres hverdag. Årsagen er, at alle finder de små bysamfund værdifulde enten på grund af kulturelle forhold, på grund af kærlighed til deres eget bysamfund eller på grund af den diversitet, de tilsammen repræsenterer. Denne værdi udtrykkes i sammenhæng med manglen på beskæftigelse og manglen på tilbud, der kan fastholde de unge, og selvom de unge selv finder, at det at flytte til en større by er attraktivt for dem, så ser de alligevel en interesse i at bevare de små bosteder. Der peges på forskellige løsningsmuligheder i portrætterne. En foreslår, at den trafikale infrastruktur udbygges, "tænk hvis vi kunne køre fra by til by med tog og dermed arbejde i de store byer, imens vi blev boende her," reflekterer han. Industriudvikling ses af alle som en mulig løsning på problemet. Som Evannguaq forklarer i portrættet tidligere i denne artikel: " Mangel på arbejdspladser i de mindre byer medfører en situation, hvor folk tvinges til at flytte, selvom de ikke har lyst til det. Derfor er industriudviklingen positiv, hvis den medfører flere jobs i de små byer". Nuka Pavia Wille mener til gengæld, at der skal satses på at udvikle små erhverv, der kan gøre borgerne i stand til at forsørge sig selv i de små bysamfund, så det bliver muligt at blive boende. Han peger på eksempler som turisme og kunsthåndværk

Uddannelse er en anden værdi, der går igen i portrætterne. Der er en generel enighed om behovet og vigtigheden af, at flere unge uddannes og gerne på højere niveau end tidligere. De portrætterede føler, at der er for få uddannelsesmuligheder i de små bysamfund, og at manglende sproglige kompetencer kan forhindre muligheden for at gennemføre en uddannelse. Samtidig er der en fælles ide om, at niveauet højnes generelt i Grønland i disse år, og at man er på vej i den rigtige retning med flere uddannelsesmuligheder og institutioner.

Trivsel er en anden helt essentiel værdi, der fokuseres på i portrætterne. Augusta formulerer det meget tydeligt i interviewet tidligere i artiklen, hvor hun udtrykker, at udviklingen bør ske i et tempo, hvor alle kan være med. Hun forklarer, at der tidligere er set dårlige eksempler på for hurtig udvikling, hvor folk "har fået sår på sjælen, som ikke vil heles". Også en af de ældre kvinder i portrætterne formulerer det bevægende: "Det er vigtigt, at der er en forståelse for, at folk er forskellige og har forskellige ønsker og værdier, og selvom det er godt, at de unge har mulighed for at forfølge deres drømme andre steder, så er det også vigtigt, at alle har mulighed for at leve på den måde, de ønsker"

I portrætterne udtrykkes en enighed om, at de, der taber i udviklingen, er bygdeborgerne og dem, der ikke får en uddannelse,

mens dem, der "vinder," er dem, der forstår at tilpasse sig forandringerne og udnytte dem til deres egen fordel.

De 13 personlige værdiportrætter peger på en række samfundsmæssige værdier og værdirationaler knyttet til udviklingen i Grønland i dag. De giver tilsammen en delvis forståelse af de komplekse opfattelser, der ligger til grund for lokalbefolkningens bekymringer og overvejelser om fremtiden. I indledningen til artiklen blev det forklaret, at der på politisk niveau gøres en indsats for at balancere industriudvikling samt miljø- og sociale hensyn. Som et redskab til at skabe denne balance implementeres blandt andet et nyt miljøvurderingssystem. Identifikation af samfundsmæssige værdier i forhold til udviklingen, som i denne artikel, kan bidrage til en debat om og vurdering af, om de samfundsmæssige værdier, som varetages, når de store projekter besluttes, er de samme værdier, som befolkningen finder væsentlige.

Tak til de portrætterede personer for deres varme og åbne deltagelse. Også tak til Lars Rosendahl Appelquist, som deltog i udførelsen af samtalerne og til Lone Kørnøv for hendes gode forslag til artiklen og ikke mindst en tak til Kirsten Hastrup og Cecilie Rubow fra forskningscenteret Waterworlds for en spændende Ph.D. sommerskole ved Arktisk Station, der gjorde undersøgelsen mulig..

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A value-rational view of impact assessment of mega industry in a Greenland planning and policy context

Anne Merrild Hansen and Lone Kørnøv

The article reflects on the challenges to Greenland's impact assessment (IA) system in a planning and policy context, and discusses if and how IA at a strategic decision level could contribute to securing good environmental management and support sustainable development. This is done by focusing on two value-rational questions: (1) Where are we going with industrial development, IA regulation and IA practice in Greenland? and (2) What should be done? The two questions are answered through a gap analysis of legislation and IA practice and through the values for a future IA system in Greenland expressed by key actors. The research points to a need for strategic considerations in relation to planning new industries, which could be met by upstreamed IAs. A broad concept of environment in IAs, increased participation in the process and accessibility to the IA statement for all stakeholders are needed.

Keywords: Greenland, SEA, EIA, mega industry, value-rationality

WORLDWIDE, IMPACT ASSESSMENT (IA) is implemented into national environmental protection strategies on the policy, plan, programme and project levels. The use of IA is still at its early stages in Greenland, as Greenland is only now developing IA legislation at the project level. For various reasons the policy, plan and programme levels are so far excluded from mandatory impact assessment. IA is primarily carried out in relation to mining and petroleum exploration and exploitation, and with very limited public participation in the process and limited public accessibility to the environmental statement. The context in Greenland is currently changing; among other countries Greenland is undergoing organizational reforms, implementing new 'mega industries' and facing climate change challenges.

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For acknowledgements see page 144.

The aim of this article is to go beyond views upon general best practice for IA and grasp the context-specific challenges for IA implementation at the strategic level of decision-making in Greenland. The research takes a point of departure in two value-rational questions:

- Where are we going with industrial development, IA regulation and IA practice in Greenland?
- What should be done?

The article is based upon context analysis, and analysis of IA practice and existing values. It is meant as a contribution to the understanding of existing IA work in Greenland and the ongoing discussion of IA's future role in Greenland's environmental protection strategy.

Background to Greenland

Greenland is a self-governing territory of Denmark. It is the world's largest island, has an Arctic climate,

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and is occupied by a population of 56,000. Most of the island is covered by ice. The island's main economic activities are fishing and hunting, and in many ways Greenland can be defined as a developing country. The society has recently undergone significant changes and is still adjusting. Within the last century a traditional Inuit nomad hunter culture dependent on the hazards and resources of nature has (not seamlessly) been replaced by a modern western lifestyle (Rasmussen, 2005a,b).

Greenland has not yet experienced general industrialization; even though parts of the fishing fleet and production have been modernized, it was mostly unprocessed products that were exported in 2009. Therefore, to uphold the new way of living, Greenland is today dependent on subsidies from Denmark. However, factors such as the accelerating industrialization of countries in Asia are likely to compound the increasing demand for raw materials to fuel the global economy, and as Greenland contains a wealth of natural resources (minerals, oil and hydropower sources) it is positioning itself as a likely supplier of industrial demands. In Greenland, activities to attract new industries are being pursued in order to gain economic sustainability and thereby make it possible to uphold the modern lifestyle independently of Danish subsidies. Among other industries, mining and aluminium production are currently being planned.

On 25 November 2008 there was a referendum on a second step towards independence from Denmark, and on 21 June 2009 the Home Rule government was replaced by an extended Home Rule government (referred to as the Self Rule government). Under the new Self Rule all activities in connection with oil and mineral activities may be governed by Greenland if the Self Rule government decides so (Dusik, 2009; Winther, 2007; Greenland Statistics, 2009).

These new tendencies are likely to have impacts on Greenland's environment, economy and society. In relation to new industries in Greenland, IAs have been carried out in an attempt to balance the need for environmental considerations and protection, and the wish for economic growth. Today there is a legal demand for environmental approval of different types of industry, including tanneries and the onshore fishing industry. Currently, Greenland's agency for Environment and Nature is preparing a regulation of environmental impact assessments (EIAs) for the island. Institutional changes may provide an opportunity for a harmonized EIA legal framework.

There is, however, no legal framework for conducting strategic environmental assessment (SEA) of proposed policies, plans and programmes (PPPs) in Greenland. But some more strategic assessments have been made. These resemble large-scale, detailed EIAs and include assessment of cumulative impacts of proposed developments in the respective study areas. There is a perceived need for establishing a legal framework for SEA regulations that would

There is, however, no legal framework for conducting strategic environmental assessment of proposed policies, plans and programmes in Greenland

apply for PPPs in Greenland. The potential for initiating the preparation of SEA regulations has also recently been discussed in the Ministry of Infrastructure and Environment. Greenland is involved in an Overseas Countries and Territories Association (OCTA) project regarding formulation of best practice for IA in OCTA countries and identification of the weaknesses and needs in relation to the local IA legislation systems. It has also been discussed in the Self Rule government whether or not SEA should be included in a future environmental protection strategy for Greenland (Dusik, 2009).

Methodological approach

To study Greenland and the challenges to IA implementation we take a point of departure in phronetic planning research and use two out of four value-rational questions put forward by Bent Flyvbjerg: (1) Where are we going? and (2) What should be done? (Flyvbjerg, 2004). Thus, the focus is on values and evaluative judgements. An important argument for choosing this approach is the emphasis on the particular situation and context in Greenland — recognizing that there are no final, objective answers to the questions. By raising the value-rational questions we are looking for input to the ongoing dialogue about Greenland's development and how IA may be developed and practised. We do not consider the questions of desirability of the development of Greenland or the power questions related to who gains and who loses in this respect. In this way the study provides a partial understanding of the values and complexity surrounding industrial development in Greenland and the needs for a future IA system. The analysis presented is structured according to the two value-rational questions, and the methodological choices are presented in the following sections.

Answers to the question of 'Where are we going?'

The question 'Where are we going with industrial development, IA regulation and IA practice in Greenland' is answered through a context analysis and an analysis of IA practice.

The context analysis focuses on (a) the policy for gaining independence and industrial development, (b) the challenge of global warming and planning

in a vulnerable Arctic environment and (c) the existing planning and environmental legislation in Greenland.

Key documents describing the rationale for Greenland's policies are reviewed. The focus is on the laws in relation to the implementation of the Self Rule, together with existing literature on the historical social development in relation to Greenland's policy-making.

The context analysis also builds upon new research, pointing at tendencies and impacts of climate change, and a documentary study of the existing legislation requiring IA — specifically the Mineral Act and guidelines concerning mineral activities, and legislation in relation to protection of nature and environment in general.

In the **analysis of IA practice** the strategic level of IAs in Greenland is the focus, and the analysis forms part of the basis for discussing Greenland's capacity to proactively address the necessary questions in relation to future mega industry and thus secure a long-term and sustainable development for society and nature. Despite experience that securing the correct level of assessment and tiering is not a single top-down process, due to, for example, time lags between different tiers (Fischer, 2007; Arts *et al*, 2005), it is necessary to ensure that sufficient information exists at all levels to provide the basis for robust and sustainable decisions.

The analysis of the levels of assessments undertaken in Greenland is based on a review of selected environmental reports, documenting the environmental impacts of mega projects in Greenland. The documentary review is based on an analysis of the following topics and questions:

- The role of IAs: Which objectives are raised in the environmental statements as the primary reasons for undertaking the IA?
- Alternative assessment: Which alternatives are included in the IA?

The first two questions relate to the strategic level of the IA. The objectives and thereby the main questions raised in the IA are strongly linked to whether the IA is at the policy, plan, programme or project level. This in turn raises the necessary strategic question of 'why action', 'what actions' and 'where actions' and not only the question of 'how actions' at the project level.

- Concept of environment: Which environmental parameters are included in the IA?

The analysis looks into the concepts of environment included in the statements, and can conclude whether there is a narrow or a more broad inclusion of environmental parameters involved in the IA practice. On the basis of this analysis it can be discussed whether the current IA practice is capable of revealing and avoiding trade-offs.

The cases, selected from nine IAs of industrial development projects in Greenland, are:

- Aluminium production, Alcoa, SEA (Greenland Home Rule, 2008).
- Minerals and petroleum exploration, a preliminary strategic environmental impact assessment of minerals and hydrocarbon activities on the Nuussuaq Peninsula, West Greenland (NERI, 2008).
- Qorlortorsuaq hydroelectric plant, Environmental report (NIRAS, 2001).
- Gold Mine, Nalunaq Gold Project, Environmental Impact Assessment, 2002, prepared for Nalunaq I/S (SRK Consulting, 2002).

The four selected environmental statements document the environmental impacts of mega projects in Greenland. 'Mega projects' are defined as the most expensive projects in terms of infrastructure and investments in the world today, with typical cost from one hundred million to billions of dollars (Flyvbjerg, 2007). These mega projects represent a significant possible economic development in Greenland and at the same time a significant potential threat to environmental protection, human health etc. In addition, they are, because of the large investment, long-term binding projects for Greenland's society.

The four cases were selected according to the principles that the IA is: (a) of mega projects and (b) officially described as and/or named as an EIA or SEA.

Answers to 'What should be done?'

The question of what should be done is answered through an **identification of values and interest** focusing on key persons' perceptions and expectations of a future IA system. The aim is to find out how environmental assessment can contribute to society's capacity for value-rational action. What environmental values in Greenland are to be protected — from a Greenland perspective, and what role could IA play in this regard?

To elucidate the values in relation to IA, key people were selected as respondents for a questionnaire. The questionnaire was designed to answer the following value-rational questions:

- In which values should performance of IA be anchored?
- At which strategic tier should IA be carried out?
- Who should be responsible for IA?
- Who should be involved in IA and have access to results?
- Which environmental parameters have to be included in IA when planning new industries?

The selected persons are identified as people who:

- Understand the concept of IA — expressed in their job position and/or their involvement in the public debate on environmental assessment;

- Are politicians, government officials of the Self Rule; or
- Have shown concerns about and interest in environmental assessment in Greenland.

The 16 respondents included eight government officials, the Minister for Finance and the Minister for Infrastructure, Traffic and Environment, five persons from non-governmental organizations, and one private individual. In addition to the questionnaire, follow-up telephone interviews with all respondents have been undertaken.

Finally, the **comparative analysis** identifies the needs that are not fulfilled, and the possible strengths and weaknesses of the existing system. The comparative analysis builds upon the context analysis, the analysis of IA practice and the identification of values, and compares the wishes and needs with the IA practice and legislative context.

Where are we going?

In summary, the context analysis shows that climate change with higher temperatures increases the accessibility to natural resources due to ice freeing. At the same time Greenland seeks economic and political independence from Denmark and is planning to attract new mega industries in order to fulfil this aim. The warming climate and new industries will affect the environment on a yet unknown scale. Furthermore, the legislative status shows that IAs of PPPs are not demanded in Greenland, and that IA as a whole is still at its early stages. The analysis of IA practice shows that practice at a strategic level is further developed than legislatively required.

Policies for independence and industrial development

The Greenland Self Rule government is working dedicatedly towards gaining more independence and becoming an individual state. To gain independence, development and economic growth are required, and Greenland is determined to reach this aim. At the same time, there is a consciousness of the complexity related to industrial development, including the needs for climate change mitigation. The Greenland Minister of Health and Environment explained this double-sided challenge that Greenland is facing when he participated in an EU climate conference in Lisbon in 2007: 'Greenland wants to be environmentally conscious and contribute to the reduction of CO_2 emissions at the global level, but at the same time wants to be a country in industrial progress, being able to attract foreign investors to the area of minerals and petrol exploitation' (Abelsen, 2007). Thus, Greenland has a dual strategy which both exploits and protects the environment.

To establish economic sustainability a progressive policy, aiming at attracting mega industries, is now being carried out, and Greenland has the potential for significant economic development (Greenland Home Rule, 2007). Existing accessible mineral deposits are localized and a range of new projects, such as mining, aluminium production and petroleum exploration, are likely to be implemented within the next few years. Today there are three active mines in Greenland: Minelco A/S (olivine), Nalunaq Gold Mine A/S (gold) and Black Angel Mining A/S (lead and zinc) (Bureau of Minerals and Petroleum, 2009). In addition to mineral activities Alcoa and the Greenland government are also contemplating the construction of an aluminium smelter, which would begin operating around 2015 (Greenland Development, 2009). Greenland does not produce any of the ingredients of aluminium, but its abundant hydropower can cheaply power smelters. Aluminium production is a very energy-demanding activity, which is both costly and in a global context requires a low-CO_2-emitting energy supply. The potential aluminium project in Greenland includes, besides the smelter itself, construction of hydropower dams, roads, a harbour, dwellings and service facilities for workers during construction and later operation.

Global warming and vulnerable Arctic environment

Global warming with higher temperatures causes reduction of the ice cap (Kerr, 2007). The mass loss of ice is happening at a faster rate than predicted by previous models (Aoalgeirsdóttir, 2008), and the increase in mass loss of ice means that yet unidentified mineral and petrol deposits are expected to be accessed and further exploited in the future. On the Black Angel Mining A/S website homepage it is explained that: 'The most spectacular discovery on the ground in 2005 was finding an outcrop of massive sulphide uncovered by a retreating glacier. The existence of mineralization at this location was known, but previously it was covered by 60 m of ice' (Angus & Ross, 2008).

Indigenous peoples who live in areas with fragile ecosystems are particularly vulnerable when it comes to climate change, and the *Report of the Office of the United Nations High Commissioner for Human Rights on the Relationship Between Climate Change and Human Rights* emphasizes that climate change has already affected people in the Arctic (OHCHR, 2009).

Planning and environmental protection law in Greenland

Greenland's environmental protection system does not include strategic initiatives. The present national environmental protection law, Landsting Act No. 29 of 18 December 2003 on the Protection of Nature, requires that enterprises causing significant pollution, with emissions to earth, water or air, should seek environmental approval from the environmental

authority (The Home Rule) (Landsting, 2003). The enterprises concerned are listed in annex 1 to the law, and include animal husbandry, storage, disposal or treatment of waste, processing of animal raw materials and chemical manufacturing. There are no general limits for emission values, but limits can be set by the Home Rule for the individual company. To gain environmental approval the respective companies should document that they follow the laws' restrictions, and initiatives to minimize pollution should be taken before the project is implemented (Greenland Home Rule, 2004). When the project is implemented, monitoring to check that legal requirements are upheld takes place. Regarding public involvement, the Landsting Act on the Protection of Nature does not include requirements for public participation during the assessment of an application for environmental approval.

The use of impact assessments, which could be a tool for incorporating environmental protection into the planning of mega industry, is only at its early stages in Greenland. Greenland has endorsed the Espoo Convention, and a formal system for EIA is due to be implemented in Greenland, but as Greenland has not consented to the Strategic Environmental Assessment (SEA) Protocol, there are no formal demands to conduct SEAs (Hansen, 2008). SEA is an attempt at foreseeing the impacts of a decision and providing information to decision-makers, so that they can make an informed decision with minimized negative impacts at an early stage in the planning process (European Commission, 2001). The activities in relation to aluminium production etc. will require planning at a higher level than EIA only, and therefore it has been decided to conduct a SEA for the aluminium project.

Environmental protection in relation to mining and petroleum exploration is yet another story, as it is carried out pursuant to the Mineral Resources Act, which is a part of the Greenland Home Rule System and establishes the framework for joint administration by Greenland and Denmark of mineral resources in Greenland. The Joint Committee on Mineral Resources in Greenland was set up in July 1979, and has since been the central political forum for the Greenland–Danish co-operation on minerals and petroleum in Greenland (Danish Energy Agency, 1999). The respective laws in relation to environmental and nature protection do not include specific activities for mineral resources and exploitation. This exception carries, among others, the opportunity to implement mineral activities in preserved areas in Greenland. In some cases the Mineral Resources Act is more restrictive than the other environmental legislation; for example, EIAs based on two to three years' baseline studies are required to gain a licence for mineral investigations and/or exploitation in Greenland, while there is no legal requirement to perform EIAs for other mega industry projects as described above. The present Mineral Resource Act has no requirements for public involvement or public access to information besides a decisional declaration. However, the bill for a new act includes public hearing if a project will have an impact on nature and climate. In addition, the bill suggests a new requirement of public access to some environmental information, though not the entire environmental statement.

Greenland is taking home the full authorization for mineral and petrol activities in Greenland from the Danish State, including the granting and the administration of EIAs and baseline studies.

The use of impact assessments, which could be a tool for incorporating environmental protection into the planning of mega industry, is only at its early stages in Greenland

IA practice

Despite the fact that limited legislation is in place and a limited number of IAs have been undertaken, some practice exists and can be analysed. The overall results from the documentary analysis of the four selected environmental statements are presented in Table 1. The analysis of practice shows that none of the assessments takes place at the policy level of decision-making. Cases 1 and 2 are, however, both above the project level EIA.

Case 1 is labelled a strategic environmental assessment and includes six alternative locations of aluminium production and the associated constructions, such as hydropower dams, transmission lines, roads, buildings and ports. The assessment is made by the Greenland Home Rule. The assessment is primarily based on existing knowledge and points out the data yet to be collected to provide a complete overview of the area. The SEA focuses upon the impacts of alternative locations for an aluminium smelter and hydropower dams in Greenland. It also considers the zero-alternative, aluminium production in China, which is considered to be the country in which marginal aluminium production will take place if Greenland is not chosen. This alternative was assessed in a separate Life Cycle Assessment focusing on the global warming potential (GWP) emissions related to aluminium production.

Case 2 is the first strategic environmental assessment in Greenland to investigate a larger area with a view to identifying the area's sustainable capacity in relation to industry projects. The assessment was made by the Danish National Environmental Research Institute (NERI) on behalf of the Bureau of Minerals and Petroleum, Greenland Home Rule. The assessment focuses on activities such as mineral and

Table 1. Case study of four IA statements in Greenland

Strategic level IA	Case 1	Case 2	Case 3	Case 4
	Plan/programme SEA	**Programme IA**	**Project EIA**	**Project EIA**
Focus of assessment	Aluminium production including hydropower, roads, harbour etc	Mineral and hydrocarbon activities on the Nuussuaq Peninsula	Hydropower at the Qorlortorsuaq lake	Nalunaq gold mine
IA's role	'The overall aim of undertaking an SEA is to collect knowledge and points of view' (Greenland Home Rule, 2007) '... part of the total preparations for the decision regarding the location of an aluminium smelter by either Nuuk, Maniitsoq or Sisimiut' (Greenland Home Rule, 2008) The SEA should '...identify the themes and problems related to development of heavy energy-demanding industry in Greenland' (Greenland Home Rule, 2008)	'The assessment is preliminary, because it is based solely on existing information. One of the main objectives has been to identify important data gaps which should be filled in order to prepare a more elaborate strategic impact assessment or future environmental impact assessments of specific activities.' 'A SEA is included in the background for the decisions made by the relevant authorities, and may identify general regulatory or mitigative measures and monitoring requirements that must be dealt with by the companies applying for concessions' (EIAs) (NERI, 2008: 14)	'In connection with the establishment of Qorlortorsuaq hydropower plant it has been decided to prepare an environmental statement, which accounts for the environmental impacts from the hydropower plant in the construction and operational phase.' (SRK Consulting, 2002)	The IA is undertaken as an Ecological Risk Assessment (ERA) and is part of a feasibility study. 'The specific objective of the ERA is to determine the environmental impacts likely to be associated with the discharge of a detoxified tailing slurry (after substantial pre-discharge dilution with seawater) from a submerged pipeline some 130 m deep within Saqqaa Fjord in South Greenland...'. (SRK Consulting, 2002)
Alternatives assessed	Aluminium smelter located at Nuuk Aluminium smelter located at Maniitsoq Aluminium smelter located at Sisimiut Aluminium production in the marginal production country — China	None	For part of the transmission line: Cable laying New trace	None
Concept of environment	Nature, environment (aquatic environment, water resources, waste, waste water, air emissions, noise, dust), health, culture, regional development and migration	'The impact assessment encompasses only biological resources, chemical background measurements and local use of the area. Socioeconomics, archaeology and cultural history are not included' (NERI, 2008: 14)	Flora, fauna, freshwater and drinking water, landscape, animal life, cultural heritage, waste water, waste, air pollution, tourism and fishing	Marine biota, demersal organisms, epibenthic organisms, human health, existing and future fisheries

hydrocarbon exploration on the Nuussuaq Peninsula. The assessment is based upon existing knowledge and points out the data yet to be collected to provide a complete overview of the area. A point of criticism against the SEA is that no alternatives are described, and it does not relate to other plans, but only presents a description of the area and identifies potential impacts in relation to petrol and mineral activities, and explains what future EIAs for specific projects in the area should include. Thus the assessment is only dealing with 'how actions' and does not include strategic concerns of sustainable capacity.

Case 3 is one of two environmental impact assessments that have been carried out in relation to hydropower dams in Greenland. The dam in this project is supplying the two largest cities in South Greenland with power. The environmental assessment includes dam construction, hydropower plant, transmission lines and transformer stations. The assessment is based upon existing materials and common knowledge. Case 3 includes two alternatives for part of the transmission line, and the assessment describes which alternative will have less impact on the environment.

Case 4 is an assessment of a specific mining project in Greenland: Nalunaq Gold Mine. Four EIAs have been undertaken regarding mining projects. The EIA of Nalunaq Goldmine in Southwest Greenland is chosen as an example of this type of assessment. The EIA has been carried out by consultants on behalf of the mining company. The EIA of the mineral activities comprise a set of legally required parameters clarified through three years' of baseline studies on the location. The assessment itself is undertaken as an ecological risk assessment. The EIA has focus on reducing the potential impacts from the mining project, and this way it answers the project-specific question of 'how actions', as it is meant to.

In summary, IA practice shows cases at both the project level and at a higher strategic level of decision-making. The statements involve assessments according to a rather broad concept of environment. The concepts, however, vary significantly between the cases, and it is observed that explanation of the specific scoping is missing. The *ad hoc* SEA of aluminium production can be highlighted as the most comprehensive case of the four analysed. Besides working with a broad concept of environment, this case includes different location alternatives in both Greenland and in marginal production countries and these are assessed equally.

What should be done?

The overall perspective on nature and environment presented in the analysis is that humans are part of nature, influencing it, and being influenced by it, and also being dependent on natural resources to live. Therefore they should be aware of and take responsibility for the human-caused impacts on the environment. This establishes a basis for how respondents answer the value-rational question of 'what should be done'.

Stakeholders' value-rational views upon IA

The respondents' views upon wants and needs in relation to a future development of Greenland's IA system are presented below.

Values in which performance of IA should be anchored There was general agreement among the respondents that the path to future welfare of Greenland depends upon industrial development while at the same time securing environmental protection. Autonomy is not seen as important in this respect. As illustrated in Figure 1, there are various estimates of which businesses are going to carry this development, but generally the respondents point to mineral, oil and aluminium production as the main occupations in Greenland's future economy.

One respondent expressed the challenge in Greenland as to 'maintain a good standard of living without compromising on the protection of environment and nature, and at the same time preserve the cultural uniqueness. How it is achieved is, however, more complicated, but one of the prerequisites is implementing IA in relation to e.g. large plants'. According to the respondents there are several reasons why it is in Greenland's interest to protect the environment.

First, Greenland is in the process of implementing new intensive industries and should attend to local environmental interests. The international signal value of being environmentally conscious provides motivation for taking environmental interests into consideration. There is a clear indication that the respondents find that IA should be implemented in

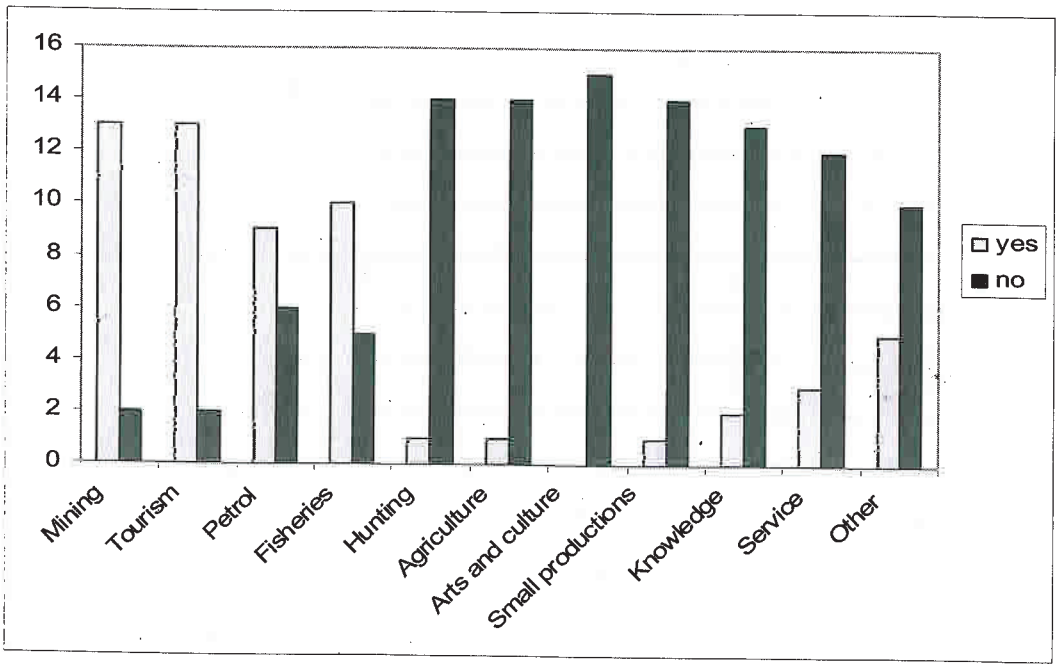

Figure 1. Businesses expected to carry Greenland's industrial development (N = 15)

response to Greenland's needs and not to promote Greenland or to protect the interests of the outside world.

Second, it was also stated that environmental assessment can help to balance industrial development and environmental protection. A respondent noted: 'It is important to preserve the environment and the Greenlandic traditions while still having an industrial development and being able to create an international community. The big challenge as I see it is to get the process towards achievement of these goals to go hand in hand.' The overall picture of Greenland's relationship to nature and environment expressed by the respondents is interpreted as follows: Man must be seen as part of and dependent on nature, and therefore he must take care of it and ensure that people do not unreasonably affect the environment.

Strategic level of IA According to the respondents, the reason why IA is relevant and needs to be integrated into the legislative system is that IA can help to ensure incorporation of environmental considerations in planning and implementation of new industries. A respondent put it this way: 'I would point to a more sustainable economic development as an essential goal for Greenland. This is probably achieved primarily through the development of large industries, e.g. in the sector of minerals and petrol. Personally and professionally I think it is important to take care of the fragile and often unspoilt nature that Greenland has — while also paying regard to the necessary economic development.' Surprisingly only half, or 8 out of 15, of the respondents believe that IAs should be made with a view to achieving sustainable development in Greenland.

It appears clearly from the questionnaires that the respondents find it relevant and necessary to implement IA at both the strategic level and the project level. The respondents all agree that a good IA should be able to cover all levels of IA (project, programme, plan and policy), but with less emphasis on the policy, for example in relation to questions of whether or not a particular industry should be promoted. A total of 12 out of 14 respondents expressed specifically that IAs should be carried out when deciding on the issue of land allocation, or licensing of new industries, and in relation to spatial planning at the programme and plan level.

It appears clearly from the questionnaires that the respondents find it relevant and necessary to implement IA at both the strategic level and the project level

One respondent added a comment about IA at the project level: 'It is important that IA is part of the basis for decision-making, and therefore they [IA] should be made before the decision is taken. It is therefore important that IAs are included as part of the decision-making and not when the project is already booted'. Another respondent wrote regarding the strategic level: 'I believe that good environmental assessment should identify, predict and communicate any potential environmental impacts over a longer cycle. In addition, it should suggest alternative proposals and a conclusion, from a scientific viewpoint.'

IA responsible The investigation gives a clear picture of who should be responsible for protecting the environment: it is mainly the public authorities and the companies. The public authorities should be responsible for 'securing that the environmental assessment fulfils legislation', and the companies should be 'responsible for doing the environmental assessment'. Regarding the politicians the respondents raise the view that they should have the overall responsibility for defining IA requirements and securing legislation. Some of the respondents point to the importance of including independent organizations in the IA works. A respondent wrote: 'To inform the public, independent agencies without public or industrial affiliation should be part of IA processes'.

Involvement in IA and access to results The respondents agree upon a broad inclusion of actors in the IA preparation (see Figure 2). Regarding IA preparation the answers are less unequivocal. The emphasis is on the companies as those who work out the IA and write the statement.

Researchers/experts and public authorities are also highlighted as key actors in IA preparation, and the need for researchers and experts to be involved in implementing IAs is primarily emphasized by the administrators themselves. Several respondents from the administration suggest that politicians be involved later in the IA process, when the final approval has been given. Differentiation between SEA and EIA is also suggested, so that EIA responsibility could be delegated to administrators. Concerning access to the results, including the IA statement, the respondents in general find that access should be secured for all stakeholders involved, and also the public.

Concept of environment in IA As all 16 respondents in the investigation found all the possible environmental parameters relevant, the analysis shows a strong interest for IA to include considerations on a broad concept of environment when new industries are planned, including local economy, national economy, culture, climate, soil, air, water, health, flora, fauna, landscapes, social welfare and settlement patterns. A respondent explained that he

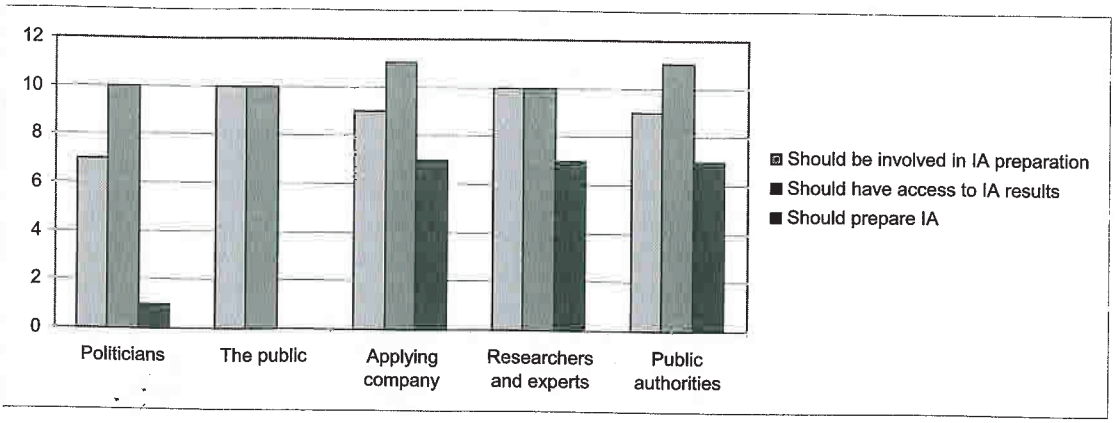

Figure 2. Involvement in the IA preparation and access to the IA results (N = 11)

believes the competence and information needed in relation to IA when planning new industries are already available: 'I believe that many of the above points are included in the application material that a company comes up with, and the central administration together with international institutions relate to these issues … I really see all the parameters as important in the planning of major new businesses in Greenland.' This indicates that the information needed for SEA is already available in some form and maybe just needs to be structured and considered from an environmental perspective.

Comparative analysis: gaps found

Comparing the results from the two value-rational analyses including the analysis of context, practice and needs/wants, three main gaps are identified. The gaps are illustrated in Table 2. Remarkably, the gaps are mainly between the legislative framework and the needs/wants, while the practice and the needs/wants are closer to agreement. The exception is involvement in the process and access to the IA results. Here the gap is related to both legislation and practice.

First, comparing the results from the three parts of the investigations it is shown that the needs/wants are actually a combination of the two others. The legislative system is focused on securing the environment through IA, the companies conduct the IAs, and consequently the companies focus on conducting a good IA to be able to gain permission to act. And the respondents find that the role of IA is to balance the need for industrial development with the need for environmental protection.

A gap is found in relation to the strategic level of the IAs. The environmental laws, even those which are still not implemented, only require IAs at the project level. However, both IA practice and the expressed needs/wants show that there is an interest and willingness to take the IAs to the strategic level including both the programme and plan level of IA. The policy level is not yet included in practice, nor is it formulated as a clear wish from the respondents.

Regarding responsibility, the analysis shows overall coherence between needs/wants, legislation and practice.

The second main gap is found in relation to needs/wants regarding involvement in the IA process and access to the IA results. As presented, the respondents agree upon the need for a broad inclusion of

Table 2. Gaps found between needs/wants, IA legislation and IA practice in Greenland

	IA legislation		Needs and wants		IA practice
Values for IA performance	Protecting the environment		Balancing development and environmental protection		Mitigation and securing industrial permission
Strategic level	Project tier	GAP	Project, plan and programme tiers		Project, plan and programme tiers
Responsibility	Public authorities, the politicians and c ompanies		Public authorities, the politicians and companies		Companies, public authorities and politician:
IA involvement and access	Companies and authorities. Limited public access	GAP	Public authorities, companies, the public, researchers/experts and politicians	GAP	Authorities and companies. Limited access for the public
Concept of environment	Different concepts. Primarily narrow	GAP	Broad concept of environment		Variations but in general broader than the law prescribes

stakeholders in the process and that stakeholders in general must have access to the results. Legislation, however, lacks clear statutory guidelines securing involvement and access to information. The limited access to environmental information has also been experienced in practice, when the authors were trying to obtain environmental statements in Greenland.

Finally, it is shown how the legislative system in Greenland does not yet include the broad concept of environment, known from the EU directive and other developed countries. But looking into practice in relation to the four IA cases reviewed it seems that more parameters than prescribed in the law are taken into consideration. The variation in the parameters included can be explained as a consequence of the different and inconsistent laws in relation to minerals on the one side and industries on the other, as the different legislations require inclusion of different parameters. Still, the cases go beyond the legal demand in their descriptions, which could indicate the need for a broader concept of environment to be able to give the full picture of the impacts of a certain project. The results from the questionnaire analysis of values and interests draw the same picture, as they show that all respondents find all the mentioned parameters relevant.

Conclusion and discussion

The development of an IA system for Greenland is complex. The system cannot be prescribed, but needs to be developed through value-rationality and a dialogue between different actors. The authors' intention has not been to suggest specific priorities for a future IA system in Greenland. Rather the article is meant to inspire reflection and discussion to achieve further insight into wishes and needs that can guide the IA system. The emphasis on value-rationality raises the questions of 'where development in Greenland is going?' and 'what should be done?'. The answers to these questions form the basis of a comparative analysis between IA legislation/practice and needs/wants, which reveals the following main gaps:

- **IA in Greenland today should be upstreamed to the strategic level of decision-making and include SEA.** The respondents are unanimous about the need for IA at the plan and programme levels. Strategic environmental assessments are not yet conducted at the policy level in Greenland. One single assessment has been carried out at the plan level, two at the programme level, and six at the project level. The situation in Greenland today, characterized by a progressive policy with regard to attracting mega industries, and combined with the vulnerable Arctic climate and global warming causing ice-cap reductions, makes it is highly relevant to discuss whether IA legislation should be taken to a higher level.
- **IA should be more inclusive towards stakeholders and increase access to IA results and statements.** With respect to the assessment process and participation, both practice and legislation are inconsistent with the expressed needs and wants. The legislation does not automatically secure access to the IA statements, and due to confidentiality some statements are not accessible to the public. The newest case studied, the SEA of aluminium production points, however, to a development of practice bending towards the expressed wants. In this case openness in the process and access to the statements are secured.
- **IA should in general be based upon a broad concept of the environment.** The analysis shows a desire for IA to include a broad range of parameters, covering more than the physical environment. However, the IA practice shows great variation in the width of parameters included and the depth to which they are assessed in the reports. It is concluded that there is a lack of common legal requirements for environmental assessments carried out in Greenland, as there is no shared concept in the legal acts and guidelines used.

The key stakeholders' views point to a need for IA legislation and practice based upon a broader concept of the environment, a safeguarding of more public participation and access to the environmental statements. Furthermore, the current industrial development in Greenland, along with climate change, points to the need for a strategic IA covering the plan and programme level of decision-making to reduce the gap between wants/needs and the reality. This includes assessing alternatives and their impacts against the needs and societal capacities, which leads to questions including how intensive an industrial development should be allowed, which industries can settle without significantly negative and irreversible consequences for the Greenlandic environment, and how will this affect the environment and society cumulatively. This discussion has just started and no decisions have been taken in this respect.

But looking into practice in relation to the four IA cases reviewed it seems that more parameters than prescribed in the law are taken into consideration

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Evaluation of Strategic Environmental Assessment effectiveness
- In the planning of an aluminium reduction plant

Anne Merrild Hansen, Ph.D. Fellow, Aalborg University, Denmark

Abstract: This paper presents an evaluation of the effectiveness of a strategic environmental assessment (SEA). Based on the formal objective of the specific SEA, the focus is on investigating how the SEA impacted on inclusion of environmental knowledge in the planning processes and decision making, when a site for an alumina reduction plant (ARP) in Greenland was selected among 12 alternatives. An analysis based on a study of meeting minutes and official statements combined with interviews with representatives of the central actor groups show that the SEA influenced three out of four key decisions and based on this the paper describes when and how the SEA was used and environmental knowledge argued in the discussions and materials regarding the project. The paper is meant to broaden up the understanding of the use and effectiveness of SEA in a Greenlandic context.

Keywords: Strategic environmental assessment, effectiveness, planning, Greenland, aluminium

1. INTRODUCTION

Accelerating global industrialization is likely to compound an increasing demand for raw materials to fuel the global economy. Greenland contains a wealth of natural resources (minerals, oil and hydropower potentials) and thereby positions itself as a likely supplier for domestic industrial needs.

There has only been a few environmental assessments carried out in relation to Greenlandic industrial development projects (Hansen and Kørnøv, 2010). Presently the largest industrial project ever to be undertaken in Greenland is being planned and regards the establishment of an aluminium reduction plant (ARP) on Greenland's western coast. The ARP project includes, beside the smelter itself, construction of hydropower dams, roads, a harbour, dwellings and service facilities for workers during construction and afterwards operation etc. A non-mandatory SEA is carried out to secure inclusion of environmental knowledge in the planning process. (Hansen, 2008) To understand the use and effectiveness of SEA in relation to mega industry in the Greenlandic context, this paper presents the results of an evaluation of the SEA's effectiveness.

The Greenlandic Cabinet signed a Memorandum of Understanding (MoU) with one of the world's leading aluminium producers, the company Alcoa, on the 25th of May 2007,

regarding the evaluation and potential implementation of an industrial project involving the development of an ARP. The MoU includes three planning phases, running from May 2007 to the year 2012 ending up with a final location, ownership model and design of the project. The operation phase is likely to start in 2017. In the first planning phase of the project running from 2007 to 2009, a site for the possible location of the ARP was decided upon. The condition for the site selection was that it should be decided upon by the Greenlandic Parliament on the basis of various factors such as impact on environment, economy, logistics, location of the hydroelectric power stations and transmission lines from the power stations. To ensure that environmental knowledge was included in the planning and decision making process a SEA was carried out in relation to the project. (Greenland Development, 2010a; P Hansen, 2010). Besides being non-mandatory, the SEA is characterised as being continuously developed and expanded in the process from 2007 – 2010. In total the SEA process includes an SEA report in 2007 (including public hearing), a hearing response report in 2008, an SEA report in 2008 (including the results from the hearing), an SEA report in 2010 plus background reports on e.g. regional development, cumulative impacts and mobility. After 2010 a follow-up and monitoring in relation to the SEA is planned. This paper focuses on this first phase of the MoU and the decision concerning a site for the ARP and the effectiveness of the SEA in this regard. This case study forms the base for an analysis based on three main types of data sources: Documents, observation and interviews.

First the paper presents a description of the method and research design. Then the results from the case study are presented regarding identification and organisation of related actor groups and the identification and description of the key decisions and the related decision-making and the decision outcome. Finally the paper concludes that the SEA was effective and it is discussed how the concept of effectiveness impacts on the conclusion.

2. METHODS AND CONCEPTS FOR INVESTIGATING EFFECTIVENESS

Measuring and achieving SEA effectiveness can be a complex and challenging task as effectiveness is a multifaceted concept. SEA on the international level is extensively put into practice, and principles, techniques and application of SEA have been commented and researched (Stoeglehner et al, 2009). But empirical research and evaluation of SEA effectiveness is still limited and often related to the output in form of the environmental report and its implementation (Fisher, 2004; Retief, 2007; Stoeglehner et al., 2009). Recently Stoeglehner, has contributed to the discussion by arguing that SEA effectiveness can be described as a combination of environmental effectiveness and democratic effectiveness divided into direct and indirect effectiveness. (Stoeglehner et al, 2009). The direct and indirect outputs are initially introduced as approaches to evaluation of SEA effectiveness by Thissen (2000) and Sadler (2004). The direct outputs relate to the primary and sub goals of the SEA such as improving environmental quality and including environmental knowledge in decision making. The indirect outputs regard changes in attitudes towards the environment like improved awareness, changes in institutional arrangements and departmental traditions, etc.

(Retief, 2007, p. 87). Besides direct and indirect environmental effectiveness, Stoeglehner et al (2009) suggest that democratic effectiveness should also be included in the model, based on the experience that SEA needs to be integrated into the planning and decision making process to make a decisional difference, and that the political system is crucial for environmental effectiveness. Democratic effectiveness refers to effectiveness when either political decision makers make decisions and choose means that fulfil the political environmental objectives and/or when the administration implements the political decisions e.g. performing SEA according to certain legislation and guidelines.

The official objective of the SEA in this case is stated by the authorities as "The SEA must provide an overall overview of relevant problems, in addition to an assessment of the consequences of the choice of different locations. - An SEA is thus an important tool in the planning phase and decision-making process" (Greenland Development, 2010b). Based on the objective of the SEA this paper focuses on the inclusion of environmental knowledge in the decision-making process of the ARP and thus on direct environmental effectiveness. Inclusion of environmental knowledge is here understood as the short-term comprehension of environmental information by the actors. The inclusion of environmental knowledge is thus based on the condition that environmental information from the SEA is accessible for the decision makers. Accessible in the sense, that the information is handed out to the decision makers or as a minimum it is explained where and how the decision makers can get it. Further it is a condition that the knowledge is used to argue for the decision that is made. The generation of environmental knowledge through the SEA is an important parameter, but not a sufficient condition for integrating environmental considerations into decision-making and for securing a priority of environmental concerns. One cause for this non-proportional linkage between knowledge and decision behaviour is the exercise of power in the decision-making processes in which preferences other than environmental ones are at play (Cashmore et al, 2009; Richardson, 2005; Kørnøv and Thissen, 2000). This linkage between the SEA and the decision-making on site selection for the aluminium smelter, and the outweighing in relation to other preferences, is analysed.

2.1 An extreme case

The results presented are based upon a single case study of the decision-making process upon the location of an aluminium reduction plant in Greenland. It is an atypical case where the decision can be characterised as a "residual, ad hoc decision affecting organizational space without temporal implications beyond the immediate event" (Katz and Kahn, 1966). The decision-making in relation to the planning of the Alcoa project is, in other words, a situation where the organisation of the Greenlandic Self-Rule is lacking policies and therefore reacts to this one event without setting a precedent. The case is also atypical or extreme in the sense that it involves irreversibility due to the large economic investment while the aluminium project due to the extensive energy requirement will delay the possibility of similar energy intensive industries in Greenland. While the project would utilize the largest individual hydro potential (Tasersiaq), there are several large unused hydro potentials, in combination easily

sufficient for a similar project, in the area between Nuuk and Paamiut. "*However, the complexity of such a project and the inferior hydrologic data for these potentials mean that such a project is less likely in the near future"* (Drechsel, 2010) Finally the non-typicality involves a study of the influence of a non-mandatory SEA being carried out for the first time in Greenland (Hansen and Kørnøv, 2008). These atypical or extreme cases are interesting and according to Bent Flyvbjerg "…often reveal more information because they activate more actors and more basic mechanisms in the situation studied" (Flyvbjerg, 2006; p. 229).

2.2 Methods employed

An important term in the study of decision behaviour is the 'decision arena', which is understood as "….localisation of these events, taking place, and termed the decision-making process." (translation of Christensen and Daugaard-Jensen, 1986, p. 22), The decision behaviour regarding inclusion of environmental knowledge from the SEA is framed around four key decision arenas in which location sites are assessed and scoped:

1) ACG and Alcoa exclude 5 sites.
2) Government officials decide on the content of a report to support political decision making.
3) The Cabinet approves the report including recommendation of a single site to the parliament.
4) The parliament decides on the recommended site.

The key decisions are defined as decisions that were made after the SEA working group was established and which impacted on the numbers of possible sites and/or officially changed the recommendation of sites and led to the final selection of a site. The arenas analysed are all related to the formal decision-making process. The process is illustrated in fig. 1.

		Alcoa	**Public participation**	**SEA**
	April 07	ACG meetings (18th and 25th)		Mission for working group
	May 07	MoU with Alcoa (25th)		
	June 07		Alcoa meets with municipalities	
	July 07			
	August 07	Alcoa Scopes out 5 sites, ACG meeting (22 th)	Public meetings	

Time	September 07 October 07 November 07	ACG meeting (13 th) MoU2 (12th) AKG meeting (19 th)		Compilation: Preliminary report (Aug-Sept) Internal hearing (9. – 12th)
	December 07 January 08 February 08	ACG meeting (30th), Recommendation by GHR (21 th) MoU3, 1. treatment of proposal in Parliament (26th)	Public hearing incl. public meetings	Review and edit: Final report (Decision making support report Jan-Feb)
	March 08 April 08 May 08	Government decides on recommendation, MoU4 Decision on site in Parliament (7th)		Report submitted to politicians in parliament

Fig 1. Planning activities in the 1st phase of the MoU.

The analysis presented in this paper is conducted as a part of a broader case study carried out according to principles by the social scientist Bent Flyvbjerg, who developed a methodology for case studies in relation to planning and decision making, among others, with focus on decision making arenas where power relations are present (Flyvbjerg, 2008; Flyvbjerg 2009). Data sources are used in combination in order to take advantage of their strengths. Document analysis is used to determine the chronology, and thus the backbone of the mapping of decisions in the project. The documents reviewed are public and internal materials on the project from the Greenlandic Self Rule, Nuuk-, Sisimiut- and Maniitsoq municipalities, the Greenlandic newspapers, and the SEA working group. The documents include reports and drafts, political spokesman messages, meeting minutes, correspondence, and press releases. Some of the documents are confidential. The documents are assembled in a case file for the purpose of documentation. In the intent of triangulation of evidence, interviews serve to verify and supplement the document review in uncovering case activities and decision behaviour. The interviews are undertaken primarily by personal semi structured qualitative interviews with key persons from central actor groups. Further, the researcher's personal observations in a 14 day period in November 2007 are also included. The observations were maid by attending meetings in the Governmental administration and physical planning group. The observation covers attendance at, an official ACG meeting the 19th November 2007, and at 3 staff meetings in the Department of Physical Planning. The key actors interviewed are the

Chair of the SEA working group, the Director of the Business Department and chair of the ACG, the Director of Greenland Development, the Head of ACG Secretariat and the Environmental Manager from Alcoa. The Actor groups are further described in the following section.

The result of the research is presented in two steps in the following section. First the potential decision makers in form of actor groups present in the decision-making arenas are identified and described. Secondly the key decisions are unfolded one by one and it is described if and how environmental knowledge from the SEA was included based on the questions 1) if environmental information from the SEA process was accessible and 2) if it was used to argue the decision made.

3. ACTOR GROUPS AND ROLES

In the investigation the actor groups are defined as those who had an official task in the 1st phase of planning the ARP. The actor groups are identified by the content of service contracts and by central actor statements.

The actors who participated in the 1st phase of the planning of the ARP, their role and task are the following:

Parliament: Decision maker. GP should decide on a site for the ARP.

Cabinet: Authority should formulate a proposal for a legal framework and inform the Parliament of its decision-making.

Alcoa: Project applicant, should conduct technical investigations and economical feasibility studies.

Administrative Coordination Group: Planning administrator, Should manage the process.

The Business Directorate: Planning secretariat, should meet and respond to demands from the ACG and The Cabinet.

Greenland Development: 'Negotiation Unit, Should contribute to a "smooth" process towards implementation of the project including discharge negotiations between Alcoa and the Greenlandic Government.

SEA working group: Assoc. working group. Should secure inclusion of environmental knowledge in the decision-making.

An organisation diagram for the actors in the 1st phase of the planning process of the ARP is illustrated in fig 2.

When the Greenlandic Cabinet and Alcoa initially agreed on a Joint Action Plan back in July 2006 an administrative coordination group (ACG), was established within the cabinet's administration, to handle the planning process in relation to the ARP. The ACG was also responsible for the economical administration of the project (Jæger, 2010). The Business Directorate was appointed to function as secretariat for ACG. The members of the ACG were appointed from the very top of the organisational hierarchy within the Government's administration and included directors from the departments of economy, environment, business, infrastructure and housing, minerals and petrol. The director of the business department functioned in this phase also as the chair of the ACG, and the general administration of the ARP was simultaneously located in the Business Directorate. Furthermore selected employees from Greenland Development were associated to the ACG as scrutinisers. (ACG, 2007; P Hansen, 2010; Drechsel, 2010) The objective of the ACG was, according to the Director of the Business Directorate who was also chairing the ACG, *"to investigate some closer defined issues regarding the MoU in separate phases to avoid that there were used more money than necessary, before it was clear if the project was implementable or not"* (P Hansen, 2010)

Furthermore a company, Greenland Development A/S, was established in 2006, first as an affiliate of Greenland Tourism & Business Council, but since the summer of 2007 placed directly under the Cabinet, to handle the communication and negotiations between Alcoa and the Cabinet. There were different reasons for placing Greenland Development closely to the Cabinet. Initially the reason for establishing a company instead of a negotiation unit within the administration of the Government was in the interest of handling information discretely, so Alcoa would not risk public accessibility of confidential information. The confidentiality enjoyed by potential mining investors in their relation to the Bureau of Minerals and Petroleum in Greenland could not be directly copied to this project, as this protection in relation to minerals investors was stipulated in the Danish Minerals Act – now the Greenland Minerals Act. Later, the protection of confidentiality has been set up as a contract between Alcoa and the Cabinet in the MOU. Still there were other reasons for keeping this structure among others the because of difficulties to recruit the necessary competencies to the Business Directorate. There was also a risk that the project might draw too much focus and personnel from other administrative tasks within the directorate – or oppositely – that the daily operational needs would draw necessary resources from the developing project. Since the project's inception it has been taken for granted that it should be possible to close down the project with relative ease and limited additional expense if need be – i.e. if the hydropower was proven insufficient, if there were indisputable environmental showstoppers, if Alcoa were

to pull out. *"I tell every new employee that they should not expect to grow old in GD - we have short term office leases, and the only fixed asset the company has on our books is our photo copier. Thus, if Government should at any point decide that GD shall not carry out our tasks anymore, our organization can be easily dismantled."* (Drechsel, 2010)

Besides upholding the communication and negotiation with Alcoa, Greenland Development was also given the task of collecting and passing on information to ACG both from Alcoa and from external consultants, regarding technical, economical and social aspects of the project (GD Service contract, 2006; Drechsel, 2010). According to the Director of Greenland Development A/S, the main task for the company was to *"secure a smooth negotiation process with Alcoa towards an implementation of the project"* He further explains: *"Large and modern foreign companies like Alcoa are used to communicating and negotiating with local authorities. What they really need is a local contact that can direct them in the right direction and create a contact to the people they need to talk to and have an overview of the approvals necessary to gain in order to implement the project. That is the function we have in Greenland Development. You could call us key account managers. We have a service to sell. We want to sell an investment opportunity in our country. - But not at any price. In order to succeed, any project must offer a competitive return on investment, and the host country must provide an investment-friendly environment. However, it is a clear obligation for us to help ensure, that through regulation, taxation and an adaptable workforce the project must also bring substantial long term advantages for our country"* (Drechsel, 2010).

The Board of Greenland Development was largely composed of government officials, as it would otherwise seem that Greenland Development had all powers vested in us. In the period analyzed the company had a 5 person board consisting of:

- Director of National Power Authority
- Permanent Secretary, Ministry of Industry
- Permanent Secretary, Premier's Office
- Director of Environmental Agency
- CFO, Vice President of Tele Greenland

Thus, there has always been a very close link between GD, ACG, the business directorate and Cabinet.

There was no legal requirement for Cabinet to include Parliament in the site selection process. However, the Cabinet (both the former and the present) argued that due to the scale and permanence of these decisions, they should be made by Parliament, and with greatest possible inclusion and consensus amongst the parties. So the Cabinet chose to delegate authority to Parliament. (Jæger, 2010; Drechsel, 2010)

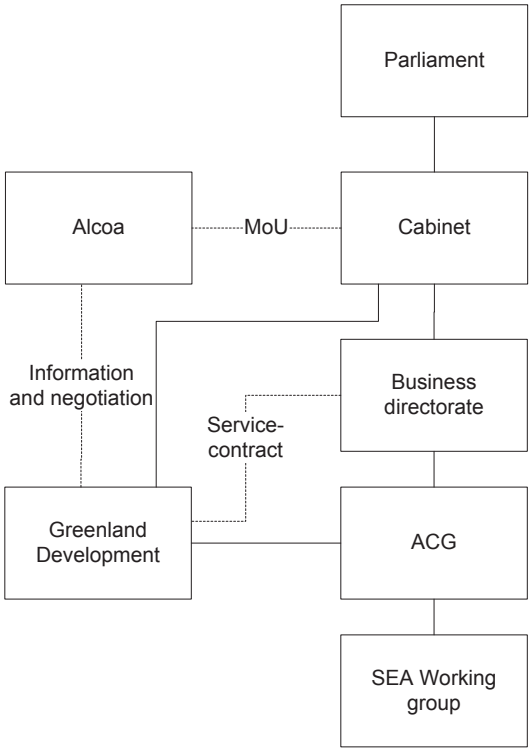

Fig 2. Organisational structure of the actors in the 1st phase of the MoU

When the MoU was signed in May 2007, the ACG decided to set up an SEA working group to coordinate the SEA process. Two other working groups were simultaneously established regarding socio economic matters and labour relations. These were unlike the SEA working group set up within the other institutions on the scene, namely Greenland Development and the Business Directorate (Drechsel, 2010; Jæger, 2010). The SEA working group was set up as a working group under the ACG and was cross departmental. As chair for the SEA working group, ACG appointed the head of the Department of Physical Planning which is positioned within in the Department of Environment and Health. The reason why the SEA was organised to be placed externally and not in other institutions related to the planning of the ARP was based on both recommendations from an SEA expert from Aalborg University who was guiding the authorities and on the assumption that a more independent working group was necessary to avoid conflicts of interests regarding environmental and economical issues (P Hansen, 2010; KG Hansen, 2010; Drechsel, 2010). The SEA working group was set up across the relevant directorates, and a budget of approximately 1.5 million US$ was approved. The SEA chairman was affiliated to ACG for cases that were directly related to the SEA process. (SEA, 2007; KG Hansen, 2010; P Hansen, 2010) The Chair of ACG explains why the environmental assessment was not integrated into one of the other related institutions: *"The environmental responsibility was anchored within the environmental directorate for the SEA working group to take care of the coordination. It was our opinion that it had to live its own life, to make sure that everybody could see that the environmental interests were not suppressed. We could say to the politicians and the public, that somebody had it as their main*

task to secure the environmental investigations and bring them forward in the decision making process to avoid conflicts of interests". (P Hansen, 2010)

4. ENVIRONMENTAL CONCERNS IN KEY DECISIONS ON SITE SELECTION

Initially there were 12 alternative sites to select from for the ARP. In January 2007 the ACG requested that the municipal authorities in Nuuk, Sisimiut and Maniitsoq specify possible sites for the location of an ARP. The three municipalities are all located in an accessible area from the potential hydropower resource on which the ARP should base its power supply. As aluminium production is a very energy intensive industry, the hydropower potential in Greenland is the main reason for Alcoa's interest in placing an ARP there (Drechsel, 2010). The request for the municipalities to identify three sites each was based in the argument that the municipal authorities possess the best local knowledge. The municipalities then pinpointed areas within the municipality that, seen from their perspective, had the best

potential and were ideal for further study. (DSR, 2008; Jæger, 2010) The three municipal

authorities each pinpointed different sites for the ARP, Nuuk and Maniitsoq pointed at 3 sites each and Sisimiut pointed at 6 sites, 12 sites in total.

Fig 3. Map of Greenland illustrating the locations of the cities of Nuuk, Maniitsoq and Sisimiut, where the potential sites for the ARP were pin pointed.

To grab the context of the decision making four questions are raised in the analysis of the key decisions:

1. Who had the formal decision-making competence?
2. Was information of environmental knowledge accessible due to the SEA?
3. Was environmental knowledge used to argue the outcome?
4. What was the outcome of the decision?

4.1 Key decision 1, Alcoa excludes 5 sites

Alcoa representatives were invited by the ACG to initially investigate the pinpointed sites. The investigation had the purpose of detecting if some of the sites should be excluded on objective grounds before deeper and more expensive investigations were carried out. (P. Hansen, 2010; Drechsel, 2010)

The decision proceedings were held by Alcoa and from the 16th – 20th August 2007 Alcoa's team of engineers inspected 11 of the sites – the 12th site was immediately excluded "because of the geographically isolated location and the high risk of ice in the fjord" (DSR, 2008, 34; MoU, 2007).

Environmental knowledge was not obtained at this early level of the SEA and environmental knowledge was not included in the decision-making. A government official from the secretariat in the Business Department explains: *"Alcoa's exclusion of sites was based on pure technical data: - is it possible to place a port? - Is the water deep enough? So it was pure engineering. The sites they excluded did simply not fit within the frame of the project"* (Jæger, 2010).

Still the Director of Greenland Development finds that environmental concers were made even if it was not formalized: *"The municipalities had already looked to environmental parameters in their site selection process. Also, after passing the municipality criteria SEA/ESHIA criteria were applied in: For example, Maniitsoq site 1 was deemed to be too close to the future town development. The site would thus not provide a sufficient buffer zone. Together with the topography (technical issues) of the site, this was grounds for the exclusion of the site."* (Drechsel, 2010).

In total five sites were excluded by Alcoa due to the initial inspections. One of the excluded sites was in Maniitsoq, one in Nuuk and three in Sisimiut. The delimitation of the number of sites was confirmed by the ACG. Seven sites remained as possible locations for the ARP.

4.2 Key decision 2, The ACG decides on the content of the decision support report (DSR)

Subsequently a technical evaluation of the remaining seven sites was carried out by Alcoa's engineers including: port conditions, the location and protection against wind and weather, freshwater supply, and the possibility of future expansion (Jæger, 2010). Alongside of the technical investigations citizens meetings in the three municipalities were carried out, informing about the results of the SEA and the project as a whole. Before the cabinet should decide on what to recommend regarding sites, all the information from the investigations were screened and summarized in the DSR. Data collection and selection was carried out by the ACG. The DSR included a resume of the SEA which was written and formulated independently by the chair of the SEA working group. Furthermore, the DSR included a technical evaluation from Alcoa and a rough estimate of the economy related to the establishment of the ARP. The exact numbers were kept confidential in accordance with the MoU agreement (DSR, 2008).

While the ACG was in charge of the planning process they had the decision competence, and at the 30th January 2008 ACG had the last meeting in the first phase of the MoU, deciding on the final content and recommendation in the DSR for the cabinet.

The ACG was continuously informed of the results from the SEA working group, and the results were presented and discussed. By the 30th of January 2008, the content of the SEA was settled. The recommendation was argued by environmental, technical and economical parameters. Therefore it was a case of informed decision making from an environmental perspective when the ACG decided. The SEA had its own chapter in the DSR. (DSR, 2008; KG Hansen, 2010; P. Hansen, 2010)

The environmental knowledge was used to argue the outcome. The DSR recommended a single site due to the fact that there were no environmental showstoppers identified with the site. It was also argued that some sites were problematic due to environmental parameters. (DSR, 2008)

Still the economics were the primary reason for the recommendation. A government official from the secretariat in the Business Department explained: *"The goal was initially for the information report to include three sites, one from each city. It was a sort of political decision in order to create a good and equitable process. It was the framework chosen - it's the kind of thinking you as a government official normally has acting in a political context: how should the message be sold? All three cities wanted the ARP in their municipality. It was a highly political decision and it should not seem as if the administration had chosen in advance. We needed to secure that it was an official political decision. But when we saw the economical results of the preliminary feasibility studies, only one site was worth recommending"* (Jæger, 2010).

The ACG decided on the content including the SEA chapter formulated by the chair of the SEA working group and recommended Maniitsoq site 3 for the ARP.

4.3 Key decision 3, recommendation from the cabinet

The Cabinet met on February 21st 2008 to officially take a position on the question of where to place the ARP. Representatives from the Business Department were present at the meeting and were presented with the DSR and the recommendation from the government officials in ACG. All members of the Cabinet and the Greenlandic ministers formally had the decision competence, and were present at the meeting to participate in the decision-making.

Environmental knowledge from the SEA was a part of the material that was presented to the politicians in the Cabinet prior to the decision making, but the SEA working group was not there to present the results from the SEA. The Cabinet had already though been informed of the preliminary results earlier in the process. A government official from the Business Department explained: *"It was of cause cleared with the Cabinet before the official meeting where the decision was made. Before the official decision in the Cabinet, the information regarding the sites had been presented to the politicians. Also the Parliament was briefed prior to the reading of the bill. It was a means for the ACG to have all information out as soon as possible and so openly and early as possible"* (Jæger, 2010).

There was a generally positive approach to the ARP project and there were several politicians that mentioned the SEA positively and said that they approved of the site, among other reasons, due to the fact that there were no showstoppers identified in the SEA. The outcome was that the Cabinet approved the DSR and thereby decided on what to recommend for the Parliament.

After the meeting in the Cabinet an announcement was made, that the Cabinet recommended one site for the ARP to the parliament, pointing at Maniitsoq's site 3, "*as the site was offering the best prospects of the further development of the project*" (Translated from: Greenland Home Rule, 2008a). In the proposal for the Parliament , the Minister of Business and labour among others explained: "*The Strategic Environmental Assessment - the so-called SEA - have investigated the circumstances of nature, environment, health, archaeology and regional conditions in order to elucidate whether the project would have unacceptable effects on one or more of these parameters. The SEA has not identified factors that should stop the project. However, the SEA has identified a number of factors which should be considered in the further project cycle. These include minimizing disturbance of wildlife during the construction phase. The SEA has also identified several areas where there is a need for further studies in the next few years. The public consultation of the SEA in December and January helped in many ways to the shaping of the final report, as well as the well-attended citizen meetings became useful contributions, which are also included in the SEA. All SEA-material can be found on the website www.aluminium.gl / smv."* The Minister ends up with the conclusion: *"The Government nominates the north-western part of the Maniitsoq Island. Alcoa's technical*

and economic calculations have identified this location as the best. The environmental investigations imply also minimal risk at this location. Finally, the socio-economic and regional reviews also found that the best placement was in Maniitsoq." (Translated from Government proposal, 2008, 2)

4.4 Key decision 4, The Parliament decides on the recommended site

The 83rd item on the agenda at the Parliament of Greenland's meeting on the 7th of May 2008, was the proposal from the Cabinet about the ARP including the decision on a site. (Government proposal, 2008; Greenland Home Rule, 2008b). The Parliament in Greenland had the decision competence. The parliament met on the 7th of May 2008 and included members of five different parties. The DSR was up for vote and each of the 31 members of the Parliament could either vote for or against the proposal of Maniitsoq's site 3 for the ARP. The DSR was again the primary information material for the politicians including the summary of the SEA. Thereby information of environmental knowledge was present.

Environmental knowledge was not used as a direct argument. It was though mentioned, that the environmental assessments would carry on in the second phase and several environmental issues that should be considered further in the following investigations were identified. Nevertheless it was the economical and technical issues that were pointed at as being the determining issues. The minister of business and labour, Siverth Heilmann, spoke to the Parliament during the political treatment of the proposal saying: "*We are now at the end of the 1st phase in our agreement with Alcoa, which among other is focused on the decision of a location of the ARP. Already at the 1st reading of the proposal there was political agreement on the location in Maniitsoq, which Alcoa has identified as technically and economically advantageous*." (Heilmann, 2008)

At the 1st reading of the bill a committee across the parties was set up to look into the project. The chair of the committee started the debate in the parliament regarding the 2nd reading and the decision of a location for the ARP with the words: *"During the Parliaments 1st reading of the bill there was among the political spokesmen a clear consensus that the aluminium plant, as recommended by the Cabinet, should be placed near Maniitsoq. While also referring to the DSR, which contains quite clear recommendations for the location of the facility, the Committee has not found that there are additional bases or political needs to go deeper into this issue. The committee can therefore without further investigations join The Cabinet's recommendation for the location of the site in Maniitsoq."* (Greenland Parliament, 2008)

All members of the Parliament voted for the recommended site 3 in Maniitsoq.

4. EFFECTIVENESS OF THE SEA

When considering the performance results across the key decisions, the review results show that the SEA, in general, was effective. Firstly, in relation to the assumption of presence and access to environmental knowledge, the decision makers in three out of the four key decisions

had access to environmental knowledge from the SEA, which was submitted as a part of the decision support materials as well as part of presentations of the project from the government officials. The full SEA was furthermore accessible on the internet. Secondly, it was found that the SEA was used to argue the decisions made. A summary of the main results from the four key decisions are shown in fig.4

The first of the four key decisions is basically different from the others due to the fact, that this decision was made before preliminary results of the SEA had been found. There can be several reasons for this early decision which narrowed the number of potential sites down. It was argued by the chair of the ACG that it was due to economical interests. But the SEA could also have influenced on a narrower scope without adding to the costs, as the SEA covered the whole area of the potential sites, and not only the specific sites. In this way, the same investigation was made in relation to the SEA despite the fact that some of the sites were excluded. The SEA would therefore have had the opportunity to be more effective if the process of conducting the SEA had begun earlier in relation to the planning. This could have resulted in the initial excluding being based not only on technical data but also on environmental parameters. Actually they were. The environmental criteria were just not part of a formalized environmental EA.

	Key decision 1	**Key decision 2**	**Key decision 3**	**Key decision 4**
Date for the decision	20th Aug 2007	30th Jan 2008	21st Feb 2008	7th May 2008
Decision maker	ACG and Alcoa	ACG, GD and SEA	Cabinet	Parliament
Accessible environmental knowledge	No	Yes	Yes	Yes
Environmental knowledge used as argument	No	Yes	Yes	Yes
Primary outcome	5 sites excluded	Content of decision support report	Recommendation of Maniitsoq site 3	Selection of Maniitsoq site 3

Fig. 4. Summary of four key decisions.

The results further indicate, that the presence of the SEA and thus environmental information and knowledge in the decision making arena qualifies the environmental debate as the environmental information is used to argue the decisions made in all the decisions were that environmental knowledge was accessible.

Indirect effectiveness was present

The effectiveness can be assumed to be more extensive than what is found through the analysis of direct effectiveness taking place in formal decision arenas. The actors might also more indirectly have used the SEA to create a knowledge base on environmental issues and get insight into different preferences. As a critical note the author would therefore like to add to the conclusion that besides from the direct effectiveness, which was the focus of the investigation, the case study also indicates that indirect effectiveness was a significant part of the outcome from the SEA. This is illustrated by examples from the interviews:

"I think that the planning process and the inclusion of SEA should have positive critique. It is the first time ever that a project at this large scale has been handled cross departmental where it actually succeeded. Everybody had access to influence the process and be heard. It has become a shared project, we can benefit from drawing on this experience in the future." (Jæger, 2010)

"…we understand now, that SEA as a tool has its greatest strength in relation to regional planning, it is an absolutely correct approach to create a political understanding for the fundamental changes that projects of this type can bring to Greenland." (Drechsel, 2010)

"One of the most important things we got out of the work related to the SEA, was an overview of the environmental knowledge and data that we did not have access to. - Environmental information which had been collected in relation to other projects and mapping in Greenland or that was simply never investigated before. We further gathered a lot of these materials for the first time during the SEA process" (KG Hansen, 2010)

"Carrying out Environmental Assessments for planning purposes was new to Greenland. I think we have learned a lot during this planning process and that the SEA has something to offer that we need in relation to the administration of large industrial projects" (P Hansen, 2010)

So besides direct effects on the decision-making on the location of the ARP, the SEA also influenced other dimensions of effectiveness, hereunder the direct democratic effectiveness by paving the way for increased access to environmental information and indirect effectiveness by creating a space for broader environmental learning.

5. CONCLUSION AND DISCUSSION

In this case study, the objective of the SEA related to the planning of a site for an ARP, was to provide an overall overview of relevant problems, in addition to an assessment of the potential consequences of the choice of different locations in order to support the decision making. As the SEA was effective in securing inclusion of environmental knowledge in three out of four

key decisions in the process, the conclusion must be, that the SEA does conform to this main effectiveness criterion, and thus also to the objective in the Greenlandic context.

Furthermore the "unexpected" effects turned out to be essential to the project. Distinguishing between indirect and direct effectiveness, it is clear that all the central actors interviewed point at the indirect effectiveness e.g. change in attitudes, learning and institutional changes, as effects of major importance to both the process and the outcome. The indirect effectiveness is not investigated further in this study, but could be extremely relevant due to the fact that there is a very limited experience with SEA's in Greenland in general.

The effectiveness of the SEA both in the role of securing environmental knowledge in decision making in the planning phase and as a facilitator of learning and institutional change indicates that there is a role for SEA in relation to implementation of new industries in Greenland. Still the result of the analysis leaves the question of why the SEA was effective. There can be different reasons for the effectiveness of the SEA in this case. Would the SEA for example have been as effective if environmental impacts of significant 'showstoppers' had been detected? Or did it simply have to do with the fact, that the SEA was continuously adjusted to match the needs in the process? These are questions that still need attention in order to identify how impact assessments in Greenland can support decision making processes.

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The significance of structural power in Strategic Environmental Assessment

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Abstract: This article presents a study of how power dynamics enables and constrains the influence of actors upon decision-making and Strategic Environmental Assessment (SEA). Based on structuration theory, a model for studying power dynamics in strategic decision-making processes is developed. The model is used to map and analyse key decision arenas in the decision process of aluminium production in Greenland.

The analysis shows that communication lines are an important resource through which actors exercise power and influence decision-making on the location of the aluminium production. The SEA process involved not only reproduction of formal communication and decision competence but also production of alternative informal communication structures in which the SEA had capability to influence.

It is concluded, that actors influence strategic decision making, and attention needs to be on not only the formal interactions between SEA process and strategic decision-making process but also on informal interaction and communication between actors as the informal structures, which can be crucial to the outcome of the decision-making process.

This article is meant as a supplement to the understanding of power dynamics influence in IA processes and as a contribution to the IA research field with a method to analyse power dynamics in strategic decision-making processes. The

article also brings reflections of strengths and weaknesses of using the structuration theory as an approach to power analysis.

Keywords: SEA, power, structures, structuration theory, Greenland, network, decision-making

1. INTRODUCTION

This paper takes as its departure point the premise that power matters to impact assessment (IA) theory and practice. The day to day work of IA is unavoidably enmeshed in the politics of development, yet precisely how power works in IA in different contexts, and influences effectiveness, is far from clear. In this research we analyse structural power dynamics related to a single IA process: the SEA for a mega-project in Greenland. The case centres on a proposed aluminium reduction plant which will be the largest industrial project in Greenland to date, and includes an aluminium smelter, construction of hydro power dams, roads, a harbour, dwellings and service facilities for workers during construction and subsequent operation. Greenland is presently experiencing significant changes as a new and more autonomous Governmental constitution was implemented by the 21st June 2009, and have created a strong motivation for economical growth (Hansen and Kørnøv, 2010). Further the business structure is changing as new extractive industries are settling. This brings that important strategic decisions are being made regarding the future development of Greenland. This critical case provides a rich opportunity to explore the dynamics of power, and how such dynamics can be better conceived and analysed.

That IA provides an arena of power exercise and struggle is recognised by several scholars, and recently researchers and practitioners in the IA field have pointed to the need for inclusion of theories of power in general, to understand and capture the role and function of IA (iaia10, Cashmore et al., 2009; Richardson, 2005). In the early 1950's power investigations were based on a narrow understanding of power as the ability to control others actions, and were investigated as visible superiority in conflicting situations, and power was primarily seen as a causal relation between the behaviour of two actors (see for example Simon, 1953; March, 1955 and Dahl, 1957). The concept has been developed significantly since, and many diverse interpretations of the meaning of power have been explored. The different meaning of power has though also led to criticism that it is an 'essentially contested concept' (Lukes, 197 with reference to Gallie, 1955), 'elusive and redundant' (Astley and

Sahdeva, 1984) and vacuous (March, 1966). Power is multifaceted, which is also shown in the theoretical richness and extensive literature, and the understanding of the concept is today also broadened up to include a wide range of aspects, such as domination, manipulation, agenda setting, opinion making, discipline, force and structures (Thomsen, 2005). Consequently, different approaches to analyse power have emerged and have been tested empirically.

Within the IA field, however, there have been very few studies based on power theories. This appears to be an important lacuna because, as Cashmore et al. (2009) argue, power dynamics may significantly influence IA effectiveness. It becomes important then, for analyses of power in IA to be carried out in different contexts, to deepen understanding of these power dynamics. In the absence of an established research field it is also necessary to explore different conceptual and methodological approaches to analysing power in IA, to examine how power dynamics in and through IA can be interpreted.

The aim of this paper, then, is twofold. Firstly it elaborates – and later critically evaluates – a particular conceptual and methodological approach to analysing power in IA, inspired by Giddens' structuration theory, and methodologies of social network analysis. Secondly, using this framework, it presents the results of an analysis of structural power dynamics in the case of SEA for the proposed aluminium reduction plant in Greenland. It is important to note, however, that the selection and development of theory in this research is not based on a purely deductive approach. Rather, the identification of the main concepts of power has been informed by the empirical investigation. The decision to focus on structural power dynamics was, therefore, largely inductive. Turning to Giddens' theorisation of power, and the subsequent methodological choice of social network analysis, can be read as an attempt to refine the conception of power in IA, and to explore relevant research strategies.

We proceed as follows. Firstly, we introduce Gidden's structuration theory and develop a model for analysing power structures among actors in decision-making arenas involving SEA. In the methodology section, we explain how social network analysis was used to operationalise this model of power in decision-making, and introduce the aluminium reduction plant case and the research methods employed. Next, the research findings are presented and discussed, reasoning and explaining how power dynamics enabled or constrained actors influence on decision-making. We conclude with reflections on the particular insight provided by, and utility of, the structural power approach and the corresponding research strategy.

It should be noted that there is no claim that this analysis represents a complete, holistic analysis of power. Rather the point is to explore what sort of account of power can be established using this structural-relational approach. We are interested in reflecting on how this could be useful more broadly within a suite of approaches for analysing power in IA. This is achieved in part by reflecting critically on how the account of power found in this case makes sense in relation to the specific politics of planning and development in contemporary Greenland, and to IA practice in general. We end by reflecting on the question: Does the approach to analysing power used in this paper provide insights that could be practically useful to development actors in Greenland, and to the wider IA community?

2. STRUCTURES, POWER AND SEA

To analyse how power dynamics enable or constrain the influence of actors on decision-making, the investigation uses Anthony Giddens' structuration theory (ST) (Giddens, 1984). ST holds that social structures make social action possible, and at the same time that social action creates and/or sustains those very structures. Action and structure should therefore be understood as a duality rather than two separate entities, where decisions are neither the product of structure or actors alone, but a product of both. ST is, then, both a theory about how actors behave within structures and a theory about how structures are formed by actors.

Why use structuration theory in this study? Early empirical findings indicated that the influence of actors on the decision-making process (about alternative locations for siting aluminium production) was largely due to informal communications which developed in the process. This is in line with Giddens' insistence on 'agency' and on the potential for actors to make deliberate choices leading to different outcomes (Giddens, 1985). ST holds that power dynamics initiated by the actions of actors influence societal development processes. It thereby emphasises the actors' 'transformative capacity' and hence their power to influence development processes through existing structures or by changing or reshaping the structures. Such a theoretical approach is highly relevant for this study because it provides a lens to view the pattern of dynamics among actors in the exercise of power, and is hence seen as a useful way of investigating actors' capability to influence decision-making in the aluminium case. The theory provides an explanatory framework that raises fruitful questions and supports a critical investigation of what enables or constrains actors' influence on decision-making.

In this empirical study of power dynamics in decision-making, which centrally includes an SEA, ST suggests a different analytical approach to one based on the view that SEA practitioners will override

structures or alternatively based on the view that the agency of SEA practitioners will be fully determined by structures. Rather, ST suggests that SEA practitioners may either use and hence reproduce the existing structures or that they will change or reshape the structures through their actions, or that they will use some combination of these strategies. This approach may, then, reveal how through these engagements with structures, SEA practitioners develop and make use of their transformative capacity to influence decision-making.

Within ST, structures are defined as rules and resources. The concept of resources is central to ST, and critical in this study. According to Giddens resources are "anything that can serve as a source of power".Giddens further defines resources as *"...structured properties of social systems, drawn on and reproduced by knowledgeable agent in the course of interaction"* (1984, p. 15). He distinguishes between two kinds of resources: either material allocative (generating command over objects, goods or material phenomena), or authorative (generating command over persons or actors). Rules are understood as procedural regulations, which may be formal (written) or informal (rules and norms) (Giddens, 1984, p. 31; 33). However these are rather broad definitions, and what resources more precisely may mean remains unclear in Giddens' work. In this research we addressed this problem inductively, by using empirical indications about the relations between resources and power to achieve a working understanding of the meaning of 'resources'.

Based upon ST this article is based on the hypothesis, that power dynamics involve capable and knowledgeable (SEA) actors who use communications as a resource to secure decision competence and thereby influence decision-making

2.1 Operationalising ST through communications and decision competence

In this section we will show how Giddens' theorisation of power, influence, resources and structures is operationalised in this research. In particular we explain how, by bringing ST into an engagement with the empirical material, this approach led us to develop an analytical focus on access to (and lines of) communications, and formal and informal decision competence.

ST includes the premise that power dynamics are present in development processes at all times as a result of knowledgeable and capable actors influencing and being *"able to intervene in the world or to refrain from such intervention, with the effect of influencing a specific process or state of affairs"* (Giddens, 1984, p. 14). Power is understood as relational, because the realisation of outcomes is dependent upon other actors' behaviour. Power is, then, understood as *"the capability of actors to secure outcomes where the realization of these outcomes depends upon the agency of others. The use of*

power in interaction can be understood in terms of the facilities that participants bring to and mobilize as elements of the production of that interaction, thereby influencing its course" (Giddens, 1979, p. 93). Actions, then, involve the use of resources by actors to secure the outcome according to their particular interests. Resources are "*the media through which power is exercised*" (Giddens, 1979, p. 131).

To understand power dynamics in decision-making it is necessary to analyse how resources were used in practice. Central questions concerns how actors acted in relation to formal structures, and how these interactions led to influence on decision-making.

The early empirical findings in the aluminium case pointed to communications as an essential resource which allows actors to influence decision-making. The chair of the Administrative Coordination Group stated the importance of access to communication: *"ACG was informed continuously about the preliminary results of the SEA and so was Alcoa to secure that the process did not cause environmental problems"* (P Hansen 2010). The chair of the SEA working group further stated that *"it was important that the working group had access to participation in the ACG meetings for the part of the agenda that were concerning them. And we were invited to deliver a status on the SEA work continuously throughout the process. We also had the opportunity to contact Alcoa directly for information or dialogue"*. (KH Hansen 2010) A government official who had the role as secretary for the ACG explained how access to communication was important to the coordination of the decision-making process: "*It is the first time a project of this size has been handled cross departmental and succeeded. It is due to the fact that all the relevant actors had access to the process - to be heard."* (C Hansen, 2010)

Based on such explanations in the interviews with actors, we defined communication as a form of action through which actors impart information to one another regarding the issue to be decided upon in the key decision arena or provide background information to serve as decision making support. Further, it is generally recognised in social theory that communication causes individuals to voluntarily behave in a more collaborative way, which also indicates that access to communication is an important resource to influence decision-making. The social scientist Elinor Ostrom summarised this as follows: "*Exchanging mutual commitments, increasing trust, creating and reinforcing norms and developing group identity appear to be the most important processes that make communication efficacious*" (Ostrom, 1998, p. 7) .

According to ST, actors influence processes through agency. In this case we place the focus on the lines of communication along which such influence takes place. We follow the twin premises that actors use communication to influence the outcome of decision-making according to their own interests, and that by their use of communication actors either reproduce or reshape the formal lines of communication.

To understand significance of the use of communication as a resource to influence decision-making we introduce the concept of decision competence. Decision competence is understood as a condition where actors in a decision-making environment have transformative capacity – in other words that they can impact on the overall outcome of the process. Such competence may be formally given to certain actors, through legal and institutional means, or it may be informally secured as a result of the way actors engage in the process. So, a first reading of a decision environment may identify those who are formally competent to take a decision (such as a planning committee of a city authority), whereas attention to informality can reveal that the actions of particular actors who did not hold this formal competence nevertheless allowed them to have significant influence on the decision. It then becomes relevant to study whether the formal decision-making competencies were in fact influenced as actors developed competence informally, and further to assess the extent to which any such influence resulted from the use of particular resources.

Based on this understanding of power we find that the power dynamics can be identified in this case by first mapping 1) Communication lines and 2) Competences to take a decision and then analysing the characteristics of the power dynamics by comparing the formally stated and prescribed use of communication resources with how this actually turned out in practice.

2.2 Power dynamics in SEA

The role of SEA in general can be described as to inform decision-making regarding strategic actions, and strategic decision-making. Strategic actions are here policies, plans and programmes, defined by Wood and Djeddour (1991) as follows: *"A policy may …. be considered as the inspiration and guidance for action, a plan as a set of co-ordinated and times objectives for the implementation of the policy, and programme as a set of projects in a particular area."* As aluminium production requires implementation of several individual projects in relation to which Environmental Impact Assessments (EIA) are carried out, such as roads, aluminium smelter and port, these are collectively considered a programme.

The main purpose of SEA is to influence and change the outcome of a decision-making process (Therivel et al, 1992; Partidario and Clark, 2000; Sadler and Verheem, 1996). To ensure that environmental considerations are taken into account, IA research and literature suggests that SEA outputs should feed into various stages of decision-making, because the outcome of decisions is not necessarily determined in the final decision at the end of a process, but is shaped by input from actors continuously during the process (Therivel, 2004; Kørnøv and Thissen, 2000). To investigate a decision-making process in order to find out how power dynamics enabled or constrained actors' possibility to influence the decision-making, it is hence necessary to identify the stages in the decision making process where important choices were made that influenced the course of the process and thus the final decision. These stages are in the following called 'decision arenas' (inspired by Christensen and Daugaard-Jensen, 1986, p. 22). In the study of power dynamics in a strategic decision making process, ST offers the view that actors involved in decision-making will use resources to influence the outcome. As the role of the SEA is to feed into the decision-making throughout the whole decision-making process, the theory predicts that actors in the decision-making process, where SEA is being used, will through their use of resources either reproduce the existing structures (by doing as they always do, or as they are supposed to do according to formal rules) or reshape the structures (do something else). Therefore actors with access to influence a decision-making process need to be identified as a central focus of analysis.

Based on the SEA principles and ST it is found that two main foci are important in a structural power analysis in relation to SEA in decision-making. These are 1) Key decision arenas where SEA feeds into the process and 2) Actors in the key decision arenas.

3. *METHODOLOGY*: *MAPPING CHARACTERISTICS OF POWER DYNAMICS IN KEY DECISION ARENAS*

In the following it is explained how the different steps of the analysis are approached and investigated. The steps in the analysis of power dynamics in the case of the aluminium project are presented in Figure 1.

Analysis steps:

1. Identification of key decision arenas
2. Identification of actors in key decision arenas
3. Mapping the actors use of resources in key decision arenas:
   a. Communication Lines in key decisions (network analysis mapping)
   b. Decision Competency in key decisions
   c. Comparison with formal statements
4. Analysis of power dynamics characteristics in the process

Figure 1. Analysis steps

I. Identification of key decision arenas

Key decision arenas are seen as the stages in the decision-making process, which contained choices that influenced the course and hence impacted on the outcome of the process. Key decision arenas are identified as meetings where choices were made which impacted on the numbers of possible sites and/or officially changed the recommendation of sites and led to the final selection of a site.

II. Identification of actors in the decision making process

According to the definition presented in section two of this paper, actors are defined as individuals or groups that have an interest in relation to a specific outcome of a process. In the aluminium case this definition includes various actors as Greenland has a very small population most of the public will have some interest to promote or protect in relation to the project. As the focus is on analysing the key decision arenas in the process the number of potential actors is narrowed down to the actors formally connected to the key decision arenas. It is recognised that external actors have the possibility of influencing as well through the media, and friendships with actors in the scene or other, but in general have an interest in the outcome. Still these external and indirect influences are difficult to map and the investigation is delimited to include groups of government officials or politicians who had access to influence directly by participation in the planning process and more specific in the key decision arenas in focus of the research.

III. Mapping the actors' use of resources in key decision arenas

Mapping communication lines

Principles from social network analysis (SNA) are applied to map the lines of communication between actors in the key decision arenas. SNA is not a formal theory in sociology but rather a strategy for investigating social structures. SNA ranges from descriptive to highly quantitative modelling approaches. Compared to other social research methodologies, SNA is not focused on the characteristics or attributes of individual entities, but on the relationship between them. In its most simple form, a social network is a map of all of the relevant ties between the nodes being studied. These concepts are often displayed in a social network diagram, where the actors are symbolised by points and relations are the lines (Scott, 1991). This is an empirical approach to measuring, describing and analysing structure on the basis of relationships between entities such as actors or organisations (Welman, 1983; Kenis and Schneider, 1991).

Mapping communication lines in social networks allows visual and directly comparable results. Without predicting what we will see, SNA provides a way of looking at decision-making. Here SNA is used descriptively to identify and visualise the formal and informal communication networks between actors in the key decision arenas. The approach used here focuses on actually practised lines of communications, which are later compared with formal lines of communication.

Identifying actors' decision competence

Decision-making competence in key decision arenas is understood as the capability of actors', using formal or informal means, to significantly determine the outcome of the issue in focus in the key decision arenas, which impacted on the course of the decision-making process as a whole.

Identification of key decision arena characteristics

When the actual communications and decision-making competences in the key decision arenas are mapped, the results are compared to the communications and competences that would be expected according to statements in formal documents establishing the actors' roles in the process. The comparison is used to identify the characteristics of the decisions made in the key decision arenas, as communications and decision-making competences are characterised either as formal or informal according to the illustration in table 1.

	Formal decision making competence	*Informal decision making competence*

Formal communication	Communication is carried out according to contracts and formal agreements. The decision is made according to contracts and formal agreements.	Communication is carried out according to contracts and formal agreements. The decision is: - Made by others than those who have the formal competence and/or; - Regarding something else than formally stated and/or; - Made at another time than stated and/or - Made at another place than stated
Informal communication	Communication is carried out either: - With others than the formal actors and/or regarding other issues than planned The decision is made according to contracts and formal agreements.	Communication is carried out either: - With others than the formal actors and/or regarding other issues than planned The decision is: - Made by others than those who have the formal competence and/or; - Regarding something else than formally stated and/or; - Made at another time than stated - Made without being planned

Table 1: Model for characterisation of key decision arenas.

IV. Analysis of power dynamics in the key decision arenas

The analysis of power dynamics is based upon the characteristics of the key decision arenas as presented in table 1.

The access to communication lines in the process is seen as a resource that brings actors transformative capacity and the possibility of exercising power in the key decision arenas by securing and exercising decision competence. This decision competence is seen as the central structure in this case, which can be reshaped or reproduced by actors to influence decision-making through both formal and informal mechanisms. We recognise that other types of structures, such as traditions, culture and norms, could possibly lead to influence on decision-making, but here the analytical strategy was to focus on decision competence because it was identified as a single dominant issue in the early empirical work, whereas these other aspects were found to be far less significant. Evidence of both formal and informal decision-making competence is therefore sought to trace the power dynamics around structure in the case.

As the use of communication is understood here as an exercise of power, and we have argued that lines of communications can be both formal and informal, the exercise of power can also be seen as either formal or informal. When there is evidence that both the use of communications and the decision-making competences are informal, we take this as an indication that actors are exercising power in order to change structures and thereby gain influence on decision-making.

4. EMPIRICAL STRATEGY

The analysis presented is based on a case study approach which adopts principles proposed by the social scientist Bent Flyvbjerg for use in researching decision-making arenas where power relations are present (Flyvbjerg, 2008). Document analysis is used initially, to determine the chronology of the case and thus the backbone of the mapping of decisions. The documents reviewed are both public and internal materials on the programme from the Government of Greenland, Nuuk-, Sisimiut- and Maniitsoq municipalities, the newspapers, and the SEA working group. The documents include reports and drafts, political spokesman messages, meeting minutes, correspondence, and press releases. Some of the documents are confidential. The documents are assembled in a case file for the purpose of documentation. With the aim of triangulation of evidence, interviews served to verify and supplement the document review in uncovering case activities and decision behaviour. The interviews were undertaken primarily by personal semi structured qualitative interviews with key persons from central actor groups. Further, the 1. author's personal observations in a 14-day period in November 2007 are also included. Attending meetings in the Governmental administration and physical planning group made the observations. The observation covers attendance at, an official ACG meeting the 19th November 2007, and at 3 staff meetings in the Department of Physical Planning. The key actors interviewed are the Chair of the SEA working group, the Director of the Business Department and chair of the ACG, the Director of Greenland Development, the Head of ACG Secretariat and the Environmental Manager from Alcoa. The Actor groups are further described in the following section.

5. KEY DECISION-ARENAS, CENTRAL ACTORS AND FORMAL DECISION COMPETENCES

The time schedule for the strategic decision-making and the related SEA input to the process are illustrated in figure 2. The five key decision-arenas identified as influencing the site selection were:

- Identification of alternative locations.
- Exclusion of five sites. (1)

- Content of decision support report for political decision-making. (2)
- Recommendation of one single site. (3)
- Final and formal decision on site. (4)

The first crucial decision took place before SEA commenced, when the three municipalities chose among 12 sites, illustrating their capability to influence access to make choices that narrowed the scope of the decision-making process. The chair of the SEA working group expresses it like this: *"You could say that the municipalities had huge influence on the process of deciding on a location for the aluminium production as they pointed out the sites to choose from in the first place. If Nuuk Municipality had chosen more realistic options, then I think that the possibility of location near Nuuk would have been possible."* As the assessment of the environmental impacts was not initiated when this first decision-arena was happening, the investigation is delimited to investigate the last four of the decision-arenas. These are illustrated in figure 2. After the formulation of the decision support report including the environmental statement, the Decision support report carried the statement in the forward process and the SEA working group was excluded from further participation in the process

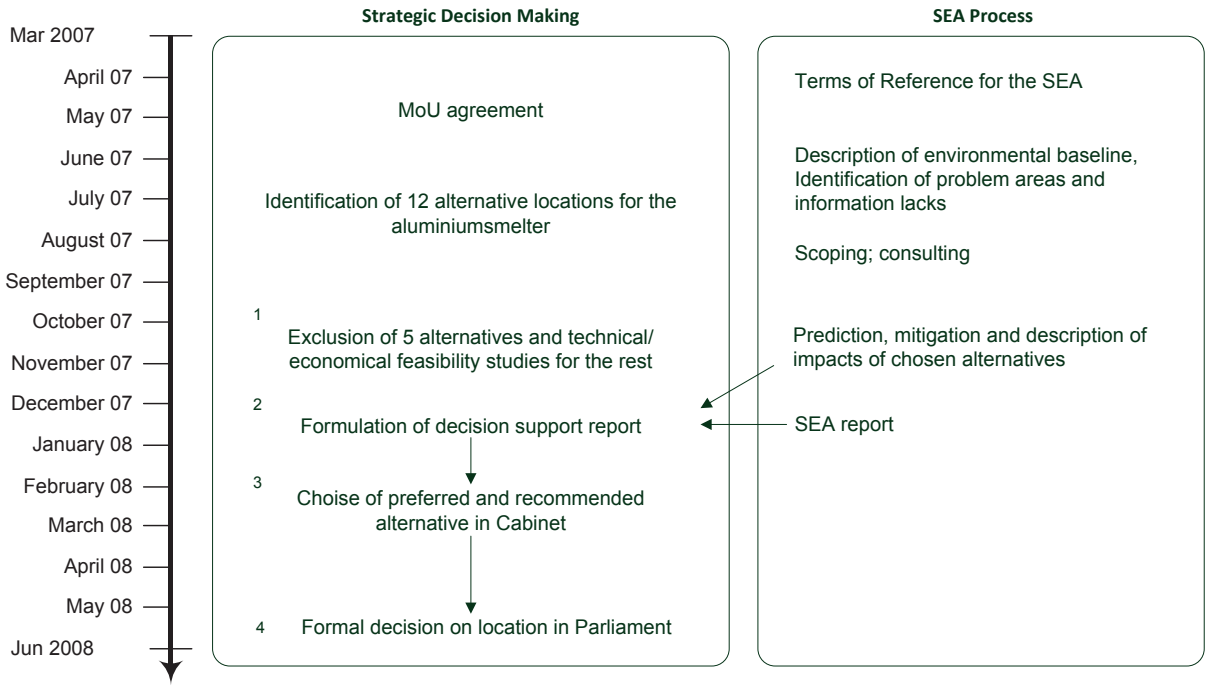


Figure 2 Strategic decision-making and formal input from the SEA process of the aluminium project. The arrows symbolise where and when the input from the SEA fed into the process (Hansen, 2010).

The central actors are presented in figure 3, separated into private actors and actors working within the Government of Greenland system.

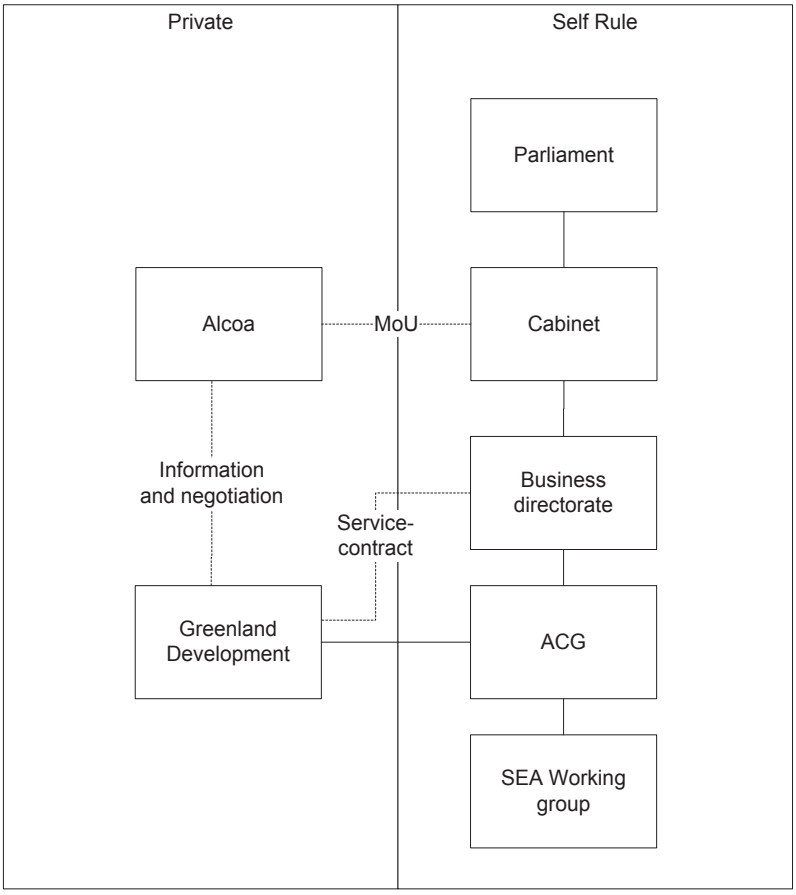


Figure 3. Organisational diagram for the actors in the aluminium case

The actors who participated in the 1st phase of the planning of the aluminium reduction plant was the project applicant: **Alcoa**, who should conduct feasibility studies. The formal decision competence was held by The **Parliament (P)** of Greenland who should decide on a location, including a **political sub group** with members from the political parties in the Parliament who had access to communicate with the administration to access information about the project, the administrator: **The Cabinet (C)** was responsible for the planning process and recommendations for the Parliament, as advisory board: the Government set up an **Administrative Coordination Group (ACG).** Their primary task was to manage and coordinate the process interacting with several Directorates, Secretariat: The **Business Directorate (BD)** had as primary task to exchange information between-, and meet and respond to needs from the ACG and The Cabinet, negotiation Unit: **Greenland Development (GD)** who's primary

mission was to contribute to a *"smooth"* process towards implementation of the project, they facilitated Alcoa and secured exchange of information between Alcoa and the ACG (Drechsel, 2010) GD's board further discharged continued negotiations between Alcoa and the Cabinet. Further there were three associated working groups: 1st The **SEA working group (SEA)** whose primary task was to ensure inclusion of environmental knowledge in decision making; 2nd The working group on education and labour under the Business Directorate; and, 3rd Economy and regional development under Greenland Development. **(MUN)** Nuuk, Maniitsoq and Sisimiut Municipality should pinpoint 3 possible sites each. (ACG meeting minutes, 2007; Interviews, 2010)

The formal communication network among actors, according to contracts and formal statements, is illustrated in figure 4.

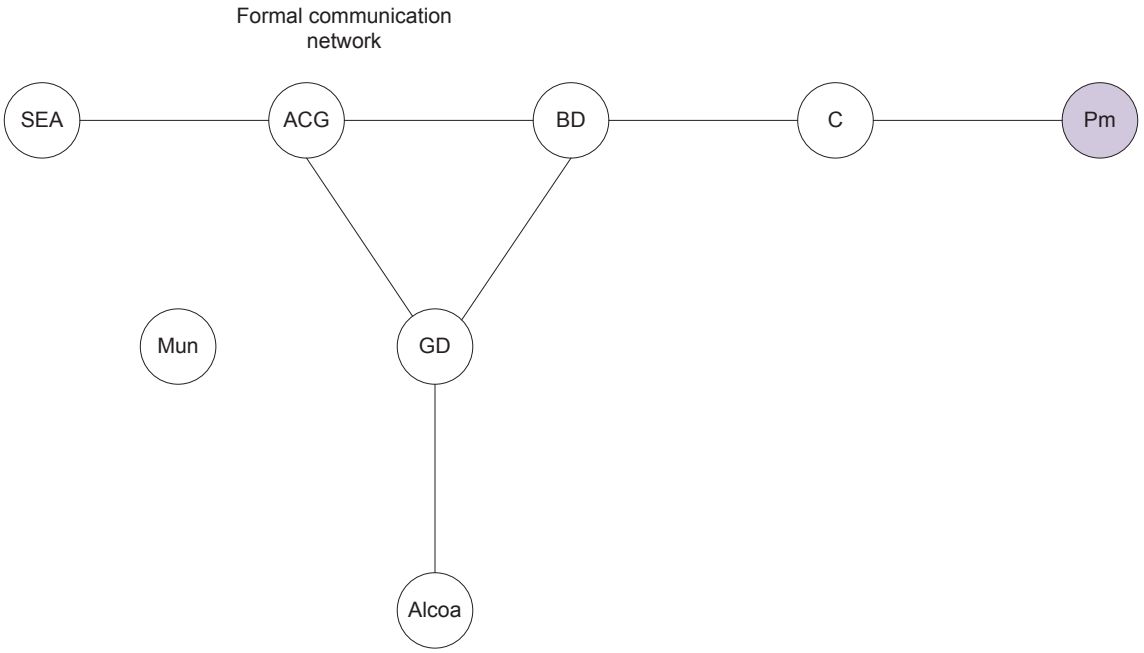


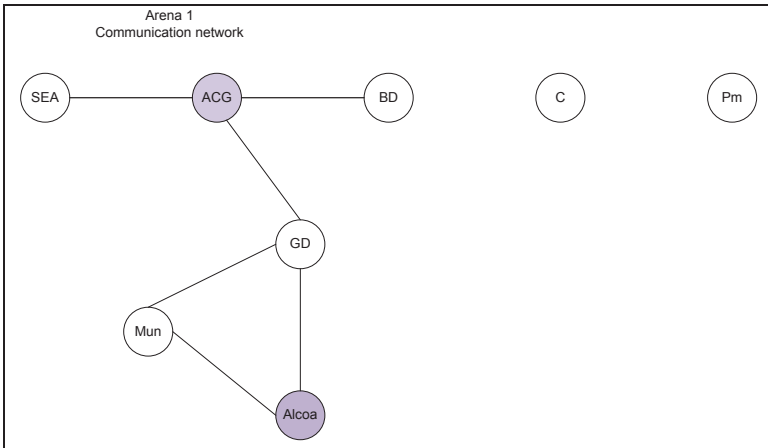
Figure 4. Formal communication network among actors.

The SEA working group was, according to the terms of reference, set up as a working group under the Administrative Coordination Group. The Administrative Coordination Group appointed the head of the Department of Physical Planning as chair for the SEA working group, positioned within the Department of Nature and Environment. The reason why the SEA working group was set up as an external group was based on both recommendations from Professor Lone Kørnøv from Aalborg University, who was guiding the authorities, and on the assumption that an independent working group was necessary to avoid conflicts of interests (Hansen, 2010).

Mapping the communication lines shows that the actors in the decision-making arenas were connected through three internally connected actors namely GD, ACG and BD.

6. STRUCTURAL POWER DYNAMICS IN THE ALUMINIUM CASE

The mapping and analysis of decision-making and communication used as a resource shows that structuration takes place due to production of structures, and that the SEA practitioners influences decision-making. The communication networks found is illustrated in table 2 and further discussed in the following text.



Decision-arena 1: Exclusion of 5 sites

The decision-making process is formal, and ACG and Alcoa are as prescribed making the exclusion decision – and environmental knowledge is not formally included in decision-making.

Communication is however informal, the SEA group and the municipalities are included in the dialogue, and the SEA feeds in analysis of impacts.

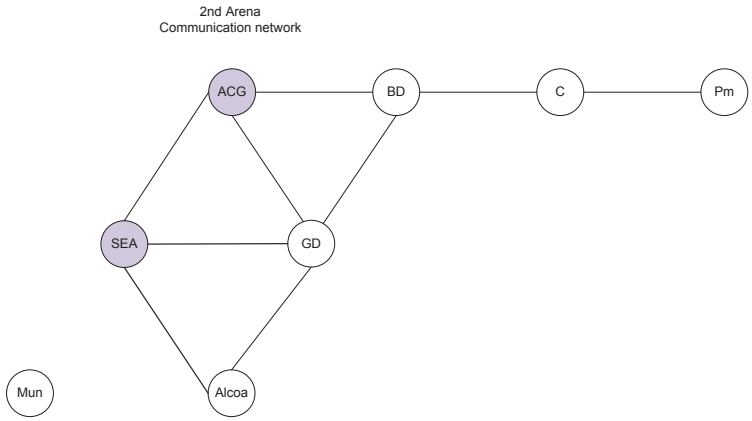
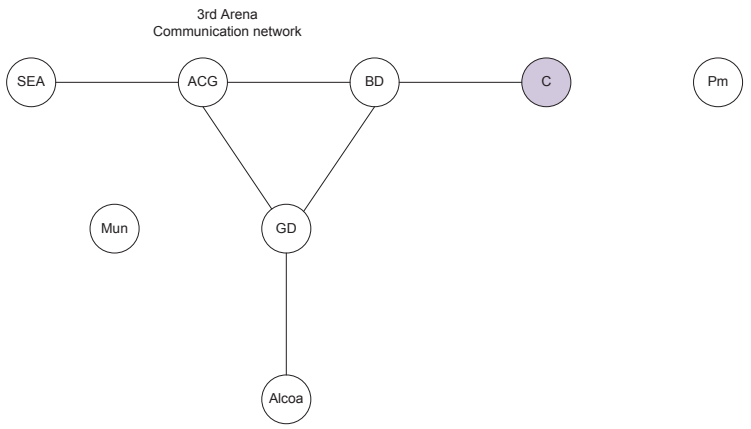
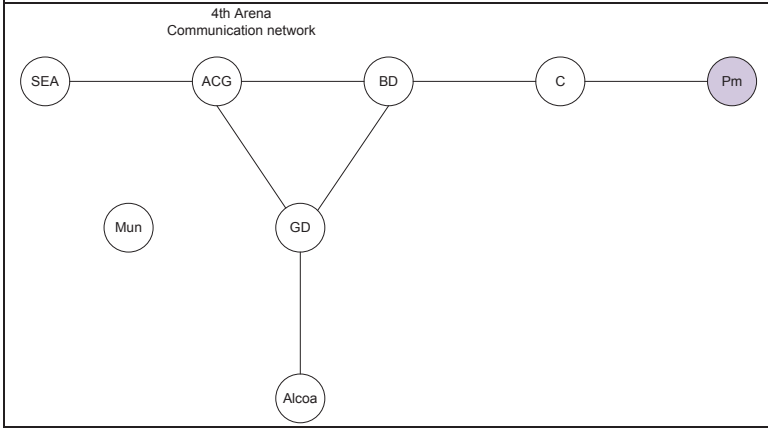
	**Decision-arena 2: Content on the decision support report** Informal decision-making allowing the SEA group formulating and deciding upon the SEA content in the basis for political decision-making. Despite formally a task for ACG and BD. Communication is informal placing the SEA group close to the ACG, who without correction included the environmental part from SEA into the decision support report.
	**Decision-arena 3: Recommendation to Parliament** Formal decision-making with ACG clearing the content of the report with the Cabinet. The communication with the SEA group was informally present, while the information from the SEA influencing the recommendation to Parliament. ACG continuously informed politicians – and not only when formally stated.
	**Decision-arena 4: Final decision on site** Informal communication structures were present with the ACG informing the politicians and communicated through media to the public before formally required. The formal decision-making competence was followed.

Table 2. Overview of communication structures in the four decision-arenas.

Decision-arena 1: Exclusion of 5 sites from further investigation

According to the MoU Alcoa should make technical investigations to exclude sites that did not meet the technical demands regarding water depth, size of area, topography and sea ice. The chair of the ACG explained: *"The five sites have not been the topic of a discussion, it has been giving itself. Alcoa stated that based on these and those criteria's and based on what they had seen when they inspected the sites together with representatives from the municipalities and by a single occasion a man from Greenland Development, the five sites were not relevant. We just accepted this. I do not recall that there at any time*

was any disagreement. Alcoa said that they could not work with these five solutions and ACG approved it, so to speak". (P Hansen, 2010)

The communication happened according to the formal lines, but not all actors were included. The ACG and Alcoa are making the decision. Greenland Development and the municipalities are participating in the inspection of the sites giving access to face-to-face dialogue with the decision makers. There is further communication between the SEA working group and ACG as the SEA working group informed ACG of the status of their work and thereby supported with potential decision background materials.

Decision-arena 2: 30th January 2008, Content of Decision support report

ACG and BD were supposed to decide on the content of the decision support report, but in practice they only made the frame and the SEA working group actually formulated the content regarding the SEA and Greenland Development ended up formulating it. But looking through the corrections made in the different drafts for the decision support report, it becomes clear, that it was the members of the ACG who corrected the content, except from the part concerning SEA - here also supported by the managing director of Greenland Development:

"In the final support report for decision-making, which GD composed on behalf of the Business Directorate, a summary of the contemporary environmental report from the SEA group was incorporated without any changes of subject matter. We though had to remove a row of budget tables, budget text etc. due to space shortage. The absence of editing can be seen due to the clear difference in text style. It was a conscious choice to avoid any suspicious that GD would influence the presentation of the SEA work" (Drechsel 2010). The non-interference in the SEA work was not expected by the chair of the SEA: *"I had actually not imagined that I would be permitted to formulate the SEA content in the decision-making support report"*. The Director of the Administration points to one reason for giving free rein to the SEA group: *"The point of departure was that we should not interfere with their professional assessments or recommendations. That would in reality make us politicians and that is not the intention"*.

Decision-arena 3: 21st February 2008, Recommendation to Parliament

Greenland Cabinet, ACG were supposed to make the decision, and formally they did. But informally the decision was made before the official decision was made as it was approved continuously. The chair of the SEA working group explained in a mail to the authors on the 29th of September 2009 that:

" I attended some of the meetings in ACG, but I did not attend the meeting where ACG decided to recommend the site in Maniitsoq. From the mails I received it was made clear, that this specific meeting was a completely closed meeting. For me this indicates among others, that the decision on a recommended site at that meeting was not based on objective facts" (KG Hansen, 2009). This is backed up in a mail of 13th February 2008 regarding the same decision arena where he states: "*The Chair of ACG decided that it was only ordinary members of ACG who should participate in the meeting together with relevant persons from GD and the secretariat .Actually in practice at this stage it primarily regarded excluding me from participating. I though received copies of mail correspondence between the other actors by Alfred (the Director of the Directorate of Nature and Environment, who was an ordinary member of ACG)".* (KG Hansen 2008).

"The goal was initially for the information report to include three sites, one from each city. It was a sort of political decision in order to create a good and equitable process. It was the framework chosen - it's the kind of thinking you as a government official normally has acting in a political context: how should the message be sold? All three cities wanted the ARP in their municipality. It was a highly political decision and it should not seem as if the administration had chosen in advance. We needed to secure that it was an official political decision. But when we saw the economical results of the preliminary feasibility studies, only one site was worth recommending" (C Hansen, 2010).

"It was of cause cleared with the Cabinet before the official meeting where the decision was made. Before the official decision in the Cabinet, the information regarding the sites had been presented to the politicians. Also the Parliament was briefed prior to the reading of the bill. It was a means for the ACG to have all information out as soon as possible and so openly and early as possible" (C Hansen, 2010).

ACG continuously cleared of the content of the report with the Cabinet. It was the formal actors but informal time of information. Still the SEA was included – but it could have been excluded until the formal decision if ACG wanted it to be – it was due to the SEA working group's communication, that it fulfilled its purpose

Decision-arena 4: 7th May 2**008, Final decision on site selection**

It was actually the Cabinet who delegated the Parliament the decision-making competence. They could have decided for themselves, still it was formalised by the Cabinet in the working plan.

Drechsel: "It became clear during the debate on FM2008 that the Parliament acknowledges that it has decision-making authority. Lots of politicians expressed in a row that they did not want to express political preferences for one or the other municipality development. The lots recognized while the municipal self-government action in relation to the work of selecting the local communities best locations. The Parliament chose to endorse the recommendation The Cabinet had made. In contrast, The Cabinet's recommendation on ownership model was not followed. It is my clear impression that The Parliament was fully conscious on its formal decision-making authority - and so was the main party in the final decision"

The politicians were informed before the publication of the decision-making support report. It was the formal actors but informal time of information.

Summary

The use of communication as a resource in the decision-arenas and the decision-making competence was found to vary between arenas. In all decision-arenas informal communications took place and in one decision-arena the decision-making competence was changed.

Decision Arena	**1**		**2**		**3**		**4**	
Outcome	*Exclusion of 5 sites*		*Content of decision support report*		*Recommendation for the Parliament*		*Final decision on site*	
Decision → competence / **Communication ↓**	**Formal**	**Informal**	**Formal**	**Informal**	**Formal**	**Informal**	**Formal**	**Informal**
Formal								
Informal	**X**			**X**	**X**		**X**	

7. CONCLUSION

Giddens' structuration theory is proposed and tested with the primary interest of discussing the nature of structural power. The hypothesis used, based upon ST, was that power dynamics involve capable and knowledgeable (SEA) actors who use communications as a resource to secure decision competence and thereby influence decision-making.

The role of power is essential in ST, and its role in SEA decision-making is important. According to ST all actors possess power: "all social actors, no matter how lowly, have some degree of penetration of the social forms which oppress them" (Giddens, 1984, p. 72). By adopting this approach, the understanding of the human agent as having power and playing an important role in securing change is emphasised in the case study.

How, then, does ST contribute to explanations of power dynamics and influence? It does this by helping to reveal the dynamics involved in decision-making, where both agency and structures interact to determine influence. By using ST, the research was able to account for agency and micro level processes influencing the effectiveness of the SEA. The focus on communication provides a particular account of how power dynamics produce structures and lead to influence on decision-making.

The case study demonstrates that, despite the presence of formalised rules for communication and decision-competence, significant informal power dynamics took place at the micro level and influenced the process from inside. The SEA working group were successful in exercising power by using the SEA to influence the basis for decision-making, to secure access to influence the course of decision-making. Since the basis for decision-making was passed on in the later processes, the SEA working group, and therefore the SEA findings, got a 'voice' – a communication – in the decision arenas.

The article shows that power is a property of interaction, and that actors play an important informal role in securing SEA influence in decision-making. The theory and analysis presented in the paper underlines the importance of recognising the need to focus on interdependence of actors in empirical studies of SEA influence and effectiveness. The possibility embedded in ST, that structures are not simply reproduced, and that agency matters, may be found to be more present in non-programmed decisions such as the one studied here. For programmed decisions where a high degree of routine is involved, the reproduction of structures is likely to dominate.

The application of ST in this case also raises some critical reflections in relation to the focus on situated interaction and power dynamics. According to Giddens, structures seems not to exist in a time-space dimension, and he emphasises the temporal presence of structures: "There is no structure in human social life, apart from the continuity of processes of structuration" and "It is essential to recognize that structures only exist as the reproductive conduct of situated actors with definite incentives and interest" (Giddens, 1976, p. 118). Following this, structures only exist in the moment production and reproduction takes place; seemingly exclude the wider social context and macro

structures. The macro level institutions, being more routinely employed and more deeply embedded in society through e.g. norms, values and actor groups' status, is from the authors perspective also critical for interaction and possible influence. This case study has used Giddens ST as a meta theory – a way to comprehend the micro level interaction and the agency that takes place. This single case study cannot explain all the elements in and behind ST. The case does though highlight agency, and the actual performance of transformative capacity, and thereby serves as an important counter to the view that structures are only limiting through their reproduction. This integration of agency and structure in ST is viewed as valuable for SEA research, in order to understand one element of the power dynamics involved.

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Change agents in the field of strategic environmental assessment: What does it involve and what potentials does it have for research and practice?

One of the challenges facing strategic environmental assessment (SEA) is finding ways to work in research and practice allowing critical interrogation and appropriate action to support sustainability. The point of departure for this article is the hypotheses that cooperative knowledge-production, where SEA researchers interact with the societal milieu as change agents, provides a potential for SEA research and practice to further sustainability. Based on literature and three cases, this paper seeks to contribute to two questions: 'what does acting as a change agent within the field of SEA involve?' and 'what potentials does it have for research and practice?' The three cases illustrate how SEA research and practice have complementary perspectives, and used together can support reflective SEA practice and practice-based SEA research. Theoretically the current understanding and discussion on change agents is sharpened through the focus on real-life linkages, putting forward the contextual influence and the unpredictability related hereto.

Keywords: Change agent, Mode 3 research, strategic environmental assessment, knowledge production.

1. Introduction

The point of departure and underlying assumption behind this paper is that to produce knowledge through SEA and impact decision-making, science and practice needs to be connected.

During the last decade science and technology have increasingly been harnessed in the quest for a transitioning towards sustainability, among other things grounded in the belief that for knowledge to be useful from a sustainability perspective, it generally needs to be coproduced through close cooperation between scholars and practitioners (Clark, 2003). The important scholarly discussion about the role and effectiveness of environmental assessment (EA) as a tool to promote sustainable development has simultaneously increased over the last years, and it has been questioned if EA has the wanted impact on the planning and decision making process. The discussion involves questioning whether EA tools are too often developed from an expert-driven perspective without sufficient attention to contextual circumstances including the practitioners' needs and capacities (Emmelin, 2006) and without sufficient understanding and recognition of the actual non-linear decision making processes (Richardson, 2005; Kørnøv and Thissen, 2000; Lawrence, 2000; Nilsson and Dalkmann, 2001; Bina, 2001). The reasons for the experienced gab between EA research and practice can be found in these arguments, and can be due to a scientific non- or low collaborative knowledge production, with a clear demarcation between science and practice.

The practice of connecting theoretical knowledge with practical problems, including a high personal engagement, is by Andrew Jamison (2001; 2008), called 'change-oriented research' and refers to a knowledge making which is problem-based with the aim"…to intervene creatively and constructively in an ongoing social or political process: to contribute to change. Rather than the traditional notion of enlightenment, by which is usually meant that the role of the scientist is to provide insights for the broader society, derived from a "disinterested" pursuit of the truth, change-oriented research is about empowerment, where the researcher applies knowledge gained from experience to processes of social learning, carried out together with those being 'studied'" (Jamison, 2010: 9). This engagement of the researcher as a change agent is in different fields of

research referred to by other names like e.g. participatory planning, empowerment and action research. Research, which is closely linked to current societal needs and is undertaken in cooperation between science and practice, is also termed 'Mode 3' (Huff and Huff, 2001; Kurek, 2007). Kurek (2007) provides an analytical framework for studying the strategic positioning of the researcher, which makes it possible to distinguish between modes of research.

Such a situated form of knowledge making can from the authors' point of view be seen as having a potential to help reconnect research and practice concerning SEA, with an aim to serve the needs and concerns of society in relation to sustainability. This paper is inspired by both Jamison's normative framework and argument about the need for change-oriented research, and by the analytical framework developed by Kurek (2007). These frameworks are used for discussing experiences with connecting science and practice, and thereby approach the mentioned insufficiencies in the field of SEA. The hypothesis, which this paper is based on, is that combining the frameworks so that the SEA researcher acts a change agent within a Mode 3 positioning has a potential to improve the connection between research and practice and promote sustainable development.

Aim

At Aalborg University's Department of Development and Planning, three research projects on SEA are conducted by researchers acting as change agents. This paper seeks to collect and communicate experiences from these cases. The paper is aimed at contributing to the following questions:

- What does acting as a change agent within the field of SEA involve? and
- What potentials does it have for research and practice?

The analyses in this paper make up an illustrative collection of experiences, illuminating possible ways of conducting SEA research in Mode 3 and the potentials it may have. It is not the aim of the paper to compare research modes, but rather to develop an analytical framework that may be used for discussing different modes of research.

With this aim, first an analytical framework is developed through a discussion of different research modes in section 2. In section 4, this framework is used for presenting and analysing the three cases, in terms of what it involves to conduct Mode 3 research, and acting as a change agent within the field of SEA. This covers discussions of strategic positioning in relation to the formal and informal frames for the research projects. In section 5 this is followed by an analysis of the potentials of Mode 3 research, based on the authors' and collaborating organisations' observations and assessments of the research projects. Thus focus is on the potentials of conducting Mode 3 research, both seen from the perspective of the researcher and from the perspective of the organisation. This underpins the objective of the paper: to identify if and how this specific setup of research provides potentials in terms of practice in the organisation and in terms of research.

2. The Discussion of Research Modes

When discussing the different modes of research with focus on the connection of research and practice, the contribution of Gibbons and colleagues in '*The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies'* from 1994 is found very relevant and inspiring. This work is an influential contribution to the ongoing discussion of the need to

improve research relevance and knowledge flows from science to practice. Gibbons et al. distinguish between two modes of knowledge production.

Mode 1, typically produced in universities and named 'ivory tower research' by critics, has the characteristics of largely being discipline-based, intra-scientifically produced and not related to a specific context for application (Gibbons et al., 1994). In Gibbons words “This structure provides the guidelines for researchers about what the important problems are, how they should be tackled, who should tackle them, and what should be regarded as a contribution to the field. In its social dimensions, it also prescribes the rules for accrediting new researchers, procedures for selecting new university faculty, and criteria for their advancement within academic life” (Gibbons, 1999: 9).

The strength of the structured research in Mode 1 is widely acknowledged. However, when it comes to research aiming at changing practice, Mode 1 research meets criticism, e.g. the risk of limited relevance of research for society. Mode 1 research on SEA does not necessarily take point of departure in experienced problems in certain contexts, and therefore it may not be relevant and it may not be applied. In line with this criticism, Gibbons (1999) point at a need for knowledge production, which is ‘socially robust’, ensured through a new social contract between research and society. It becomes not just a matter of *how* knowledge is produced but also *what* knowledge is produced. Here Mode 2 research offers a different approach.

In Mode 2 the relationship between science and practice is characterised by interaction and cooperation, which according to Gibbons and colleagues leads to change-oriented science in which “the boundaries between the intellectual world and its environment have become blurred” (Gibbons et al., 1994: 81). The characteristics are knowledge produced trans-disciplinarily, jointly and bound to a specific context. Therefore, Mode 2 research is validated by its relevance for practice. Compared to mode 1, mode 2 is argued to be "more timely, more practical, more democratic" (Huff, 2000: 291)

Huff (2000) criticizes Mode 2 research for having limitations "especially as it moves away from science and technology into management” (Huff, 2000: 291). According to Huff (2000: 292), Mode 2 research is too pragmatic and tends to make "big bets on the basis of limited evidence". Another criticism of Mode 2 is the commercialisation of research, e.g. raised by Jamison in ‘The Making of Green Knowledge’. Research is defined by market interests in funding organisations rather than by the interest among researchers (Jamison, 2001). Furthermore, Jamison (2001: 124) criticizes Mode 2 for limited change “…many of the actual practices of the companies they run and/or represent all too often continue to follow a ‘business as usual’ strategy”.

The discussion of research modes and trends in knowledge production has received considerable scholarly attention (Nowotny, Scott and Gibbons, 2001). In the midst of these discussions the concept of Mode 3 arose.

Strategic positioning and Mode 3

In line with Jamison’s discussion of the need for a ‘change-oriented research’, the limitations of Mode 2 lead Huff and Huff to suggest Mode 3 knowledge production with the purpose “…to assure survival and promote the common good, at various levels of social aggregation” triggered by “…appreciation and critiques of the human conditions, as it has been, is, and might become” (Huff and Huff, 2001: 53). The researcher within this Mode 3 is closely linked to societal needs and

compared to Mode 2 is capable of influencing his milieu by creating demand for the scientific knowledge instead of supplying on an external demand (Kurek, Geurts and Roosendaal, 2007).

Some characteristics, used in the literature on Mode 3, are multiple stakeholder involvement and interdisciplinarity, conversation and cooperation, community driven, engagement in study field, high organisational autonomy and strategic interdependence (Huff and Huff, 2001; Kurek, 2008). The normative element of Mode 3 is explicated by the goal of a 'future good' (Huff and Huff, 2001) and 'giving voice' through science as social advocacy (Jamison, 2009b).

Whereas in Mode 1 the researcher mainly is accountable to oneself, and in Mode 2 accountable to the milieu and financing organisation, the researcher in Mode 3 is mainly accountable to the people and/or environment affected both in the research process and the research outcome. Mode 3 involves not only personal, active engagement and intervention in on-going processes, but also a normative framework within which the researcher works.

The relationship between the change agent and the milieu (researchers, government, industry and NGO) is established through negotiation, and the researcher in Mode 3 must make on-going choices of how much he is willing to let others influence the research. An analytical model of the strategic positioning of the researcher within the milieu is developed by Kurek and colleagues (Kurek, Geurts and Roosendaal, 2008). The model is based upon two dimensions – organisational autonomy and strategic interdependence – and provides a typology with the different modes of researchers positioning, see figure 1.

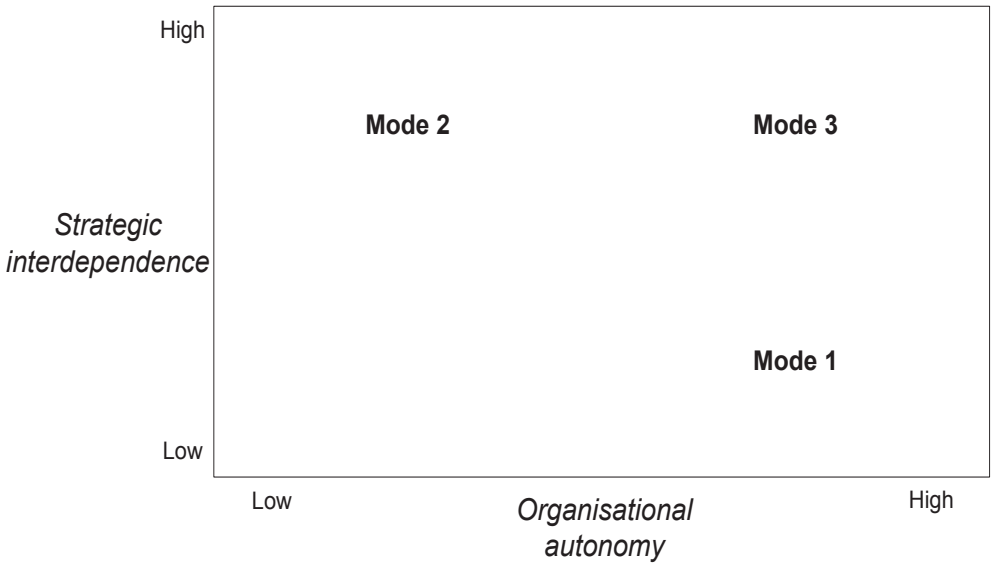

Figure 1: Three modes of strategic positioning. (Based on Kurek, Geurts and Roosendaal, 2007: 503)

We understand Mode 3 as being characterised by high organisational autonomy and strategic interdependence, and at the same time attributed a normativity guiding the ongoing knowledge making and negotiation process taking place between the researcher and the milieu. Mode 3 is building on and incorporating both Mode 1 and Mode 2 research in the process a researcher within a project and time period often will choose interplay between the different modes. A pure choice of one mode seems unrealistic or unfavourable.

In Mode 3, like in Mode 2, the researcher and milieu share resources (money, time, knowledge) but at the same time the researcher "…autonomously determine directions of research. He retains his responsibility for directing a project" (Kurek, Geurts and Roosendaal, 2007: 504). So in Mode 3 both the researcher and the milieu are strong enough to sanction each other, and both the strategic interdependence and organisational autonomy is high. This also means that the normative framework, guiding Mode 3 research, is developed by and acceptable to both the researcher and the milieu. The difference is visualised in figure 2.

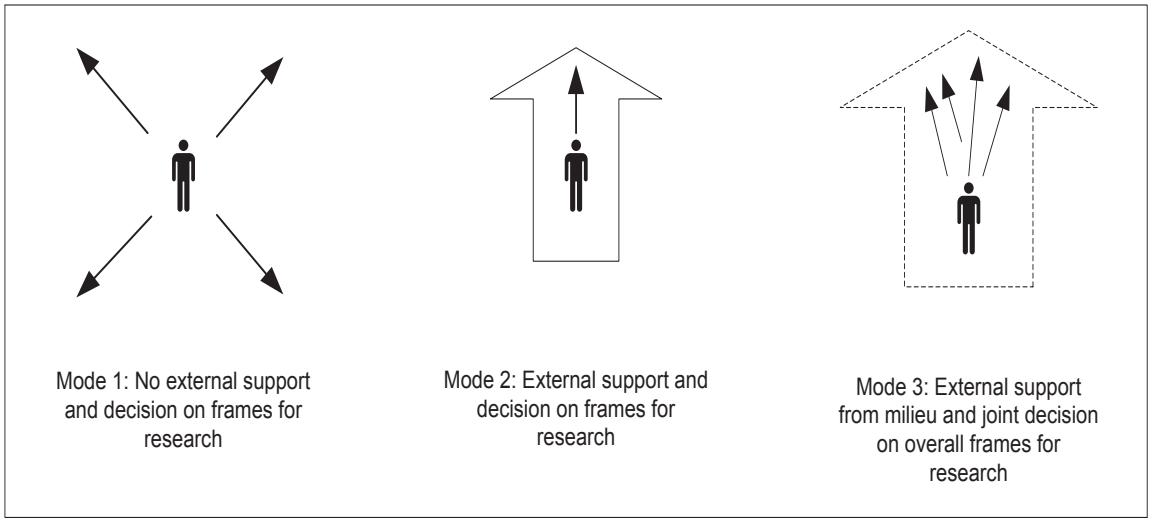

Figure 2: The relation between the researcher and external milieu in the three modes of research.

Thus we are distinguishing between three different modes of research, all with distinct advantages and disadvantages. The focus of this paper is to shed light on experiences with Mode 3 research, answering the questions of what Mode 3 within SEA research involves and what potentials it may have. However, before turning to these questions the cases and methods applied are presented in the following section.

3. Cases and Methods

The analysis in this paper is based upon case studies, from which experiences with Mode 3 research is drawn. In the following the three cases are introduced, and the methods applied in the two analyses are presented. Further information about the three cases is presented continuously in the paper, where it is included in the analysis. The analyses deal with the strategic positioning of the researchers and the potentials for SEA research and practise. The empirical basis for the analyses is document analysis, the researcher's personal observations, and subjective assessments by the researchers as well as the contact person in the organisations.

Cases studied

The study comprises three cases, where PhD researchers are working on their projects in close cooperation with an organisation outside the university. The three research projects have different foci in relation to SEA and different reasoning for the cooperation between SEA research and practice. In all three cases the organisations have co-financed the research projects.

Case 1

Case 1 is carried out in cooperation with the Danish company Energinet.dk, in charge of Danish energy infrastructure. The project is organised with an AAU-based professor as supervisor and the head of Research and Environment section as main contact person at Energinet.dk.
Aim and methodology: The project concerns the first generation of SEA of plans and programmes in relation to the national energy infrastructure in Denmark (gas and electricity). In this case, Energinet.dk faced implementation of SEA and without sufficient internal professional resources, they initiated cooperation with AAU that ended up with the project aimed at developing and implementing SEA in the energy sector, including SEA methodology targeted at the strategic decision making processes in the sector. The project has theoretical basis in decision-making theory and sense-making theory, which are used to understand practice and develop methodology. The project is based on an interactive research approach, in which the researcher is situated at Energinet.dk for a year, participating in meetings and planning processes. To maintain a critical distance, the remaining two years of the project is carried out at AAU, however, still with periodical participation in meetings at Energinet.dk. The research conducted from AAU is widely based on document analysis and interviews.

Case 2
Case 2 is carried out in cooperation with the Greenlandic Self Government and is furthermore co-funded by the independent Alcoa Foundation. The project has an AAU-based professor as main supervisor and the head of the department of physical planning from the Greenlandic Self Government as co-supervisor.
Aim and methodology: The project concerns SEA of mega industry in Greenland in a system with no legislation or guidelines in place. This case is rooted in the environmental and democratic challenge of planning and assessing an aluminium smelter in Greenland (Hansen and Kørnøv, 2009), with the aim of the research project was to secure a critical and independent view upon the processes and effect of carrying out SEA. The project is conducted as a case study of the SEA and the planning process of an aluminium reduction plant in Greenland. A theoretical approach is taken, combining power theory with impact assessment theory on the concept of effectiveness. These theories are used to setup an analytical frame for the case study. Document analysis is used to determine the chronology, and thus the backbone of the mapping of decisions in the project. Participant observation and statements are collected primarily by qualitative interviews with key persons from the central actor groups, and by attending meetings as an observant. The interviews supplement the document review concerning the case activities and behaviour, also regarding identification of interests among the actor groups and their access to resources. Based on this, reflections regarding effectiveness and power structures relating to the use of SEA as a decision making tool when planning new industries in Greenland will be made in terms of development of process and methodology.

Case 3
Finally, the project in case 3 is carried out in cooperation between AAU and the major Danish engineering consultancy Rambøll. It is organised with an AAU-based professor as main supervisor and a head of department from Rambøll as co-supervisor.
Aim and methodology: The research takes point of departure in the Danish process of preparing river basin management plans (RBMPs), implementing the EUs Water Framework Directive, and preparing SEAs of these plans. Currently, climate change as an environmental factor has been excluded from the planning process, with the reasoning that there is not enough knowledge about climate change to assess its consequences for the water environment and the RBMPs. On this background, the project is aimed at developing the work with climate change in SEA of the

RBMPs. A theoretical approach is taken, using sociological risk theory as a framework for research. Document analysis, interviews, and a survey is utilised to uncover the attitudes of different actors towards inclusion of climate change in the RBMPs, while a document analysis and interviews are used to assess the experiences with climate change in SEA in Denmark. Based on this, reflections regarding integration of climate change in SEA will be made in terms of development of process and methodology.

Analysing what it involves to be a change agent within the SEA field
The conclusion upon the formal strategic positioning of the researchers in the three cases, and thus whether and how they conduct Mode 3 research, is first and foremost reached by analysing the content of the project contracts. The standard issues like e.g. time schedule is not perceived interesting and relevant for this paper, but the non-standard and unique issues are more interesting and symbolise the negotiated parts of the cooperation. The analysis of the contracts is focused on the explicated objectives and the clauses. Both are used to indicate the strategic interdependence and organisational autonomy and thereby map the research mode. In addition informal positioning and negotiation takes places in an ongoing dialogue between the SEA researcher, the university and the collaborating organisation. The analysis of the informal process, influencing the research intention, the methods applied, and the out-put of research, is based upon the researchers observations and experience.

Analysing what potentials acting as a change agent has for SEA research and practise?
As stated previously, the hypothesis behind this paper is that Mode 3 research can support SEA and sustainable change via its potentials for connecting research and practise. This constitutes the point of departure for the analysis of what potentials Mode 3 research has. Two sources form the basis for the analysis: The first part is assessments from the researchers that point at potentials for research. These assessments are substantiated by examples from the projects. The second part is based upon open questions related to the potentials for influencing practise. The questions are answered by the contact persons at the organisations. The questions formulated are: 1) “How has the involvement of NN and his/her research influenced the organisation? 2) How has the involvement influenced the broader society?, and 3) “In which way has the involvement and cooperation influenced the SEA (understanding of SEA, the SEA process, the documents)?” and 4) “How would you characterise the strengths and weaknesses of the setup of the cooperation between your organisation and the researcher?"

In respect to the premature concept of Mode 3 research, the sources are (intentionally) not constrained by mode classifications or characteristics. The sources are in stead held open to any impact of the research and this inductive approach may support a refinement of the Mode 3 concept.. As the three cases are ongoing research projects, the analysis is primarily focused on the process rather than the outputs. The cases do, however, outline a picture of the potentials of the research mode..

4. What Does Acting as a Change Agent within the Field of SEA Involve?

The Mode 3 research is analysed in terms of the strategic positioning of the researchers in the three cases, and thus it is assessed whether and how they carry out Mode 3 research. Focus is both on formal and informal frames for the research, and these frames will show what it involves to do Mode 3 research.

The analysis begins with the strategic interdependence and the organisational autonomy in accordance with the model of strategic positioning proposed by Kurek et al. The analysis presented in table 1 and 2 are inspired and to a large extent based upon the work of Kurek, Geurts and Roosendaal (2007; 2008) who build upon Talcott Parsons' theories on social systems. Table 1 gives an overview of the parameters chosen to describe and analyse the strategic interdependence and organisational autonomy. These parameters are inspired by Parsons' model of social systems in which four media can function as exchange means: Inducement (e.g. money), deterrence (negative sanctions), commitment and persuasion (Parsons, 1963).

Strategic interdependence - Understood as the deliberate sharing of heterogeneously distributed resources, assets and capabilities between the partners in order to achieve a joint goal.	**Organisational autonomy** - Understood as the researcher's degree of self-governing the research. It is analysed in relation to the researchers autonomy to decide upon:
Economic interdependence Interdependence on exchange of information sources Interdependence on engagement	Research goals Acquiring information Working place and working balance Writing and publishing research results

Table 1: Parameters chosen as basis for describing and analysing modes of research.

Common for the research projects is that most of the strategic positioning is happening in an on-going and informal process between the researcher and the cooperating organisation. This will be analysed and discussed in the following, where the strategic interdependence and the organisational autonomy are analysed separately.

Formal and informal strategic interdependence

Table 2 shows the analysis of whether and how the researchers and organisations have strategic interdependence. The analysis shows an economic interdependence in all three cases. This is partly evident from the contracts and partly evident from the informal negotiations. The economic interdependence gives both parties a possibility for sanctioning.

The analysis of the second parameter, dependence on exchange of information sources, as shown in table 2, reveals some differences. Only case 1 is really highly dependent upon the collaborator. This has to do with the nature of the SEA research: This project has a focus of getting the right environmental information to the right people at the early stage in decision making, and to do so the researcher is very dependent on understanding the processes within the collaborating organisation. The contract in case 1 is a standard contract added restrictions on confidential data that may only be used after approval by Energinet.dk. However, both case 2 and 3 do experience some dependence upon information from other actors in the milieu, which the collaborating organisation either informally hinders or supports access to.

Another kind of interdependence is engagement in the project. The researcher is dependent on engagement from the organisation, since it is necessary that the organisation continues internal activities relating to the research and is able and willing to consider and use the research to achieve

change in these activities. If the organisation is not engaged, the researcher cannot change anything. The organisation is likewise dependent on the engagement of the researcher to fulfil the expectations of changes. In case 1, the researcher is dependent on the engagement of the collaborating organisation developing its SEA system, since this is the object of study and change. At the same time, the company relies on engagement from the research in this process of development, e.g. by securing adequacy in terms of regulation. In case 2 the interdependence is similar, since it also revolves around change in the collaborating organisation. Case 3 is different from this, because the change, which is aimed for, is not restricted to the collaborating organisation, but a wider range of actors.

	High interdependence		**Low interdependence**
Economy	Researcher is either fully or partly funded by the organisation and the organisation must get return of their investment in the project		Researcher is economic independent and the organisation is not dependent on return of their investment.
Formal	*Case 1, 2 and 3*		
Exchange of information sources	The organisation is an essential source of information for the researcher and the organisation needs information from the research society		Researcher is not dependent on information from the organisation and opposite
Informal	*Case 1*	*Case 2 and 3*	
Engagement	The researcher and the organisation are mutually dependent on the other parts' engagement in the project		Neither the researcher nor the organisation is dependent on engagement from the other part in the project.
Informal	*Case 1 and 2*	*Case 3*	

Table 2: Analysis of the SEA researcher's strategic interdependence in relation to the collaborating organisation. Whether the dependence is explicated formally (in the contract) or informally in the process is indicated in the left column.

Formal and informal organisational autonomy

Table 3 shows the analysis of whether and how the researchers in the cases have organisational autonomy. Regarding to what extent the researchers set research goals autonomously, the analysis shows both high and medium organisational autonomy for all cases. Formally, based upon the contracts, the autonomy is assessed as high/medium as all cases include a loosely formulated goal - for the research. In case 2, the contract emphasises the need for an autonomous researcher, providing critical and independent guidance based on "insider" knowledge/understanding. It is furthermore emphasised that the researcher must work independently and with high validity in relation to the second co-funder Alcoa Foundation. Differing from this, in case 3 the consultancy expects the PhD-study to "enter directly into Rambøll's work with developing services and having dialogue with costumers", which is limiting the autonomy for setting research goals. Within the broadly stated research goals, the researcher informally decides on the research in negotiation with the collaborating organisation.

The contracts do not mention methods of data collection, besides the data collected through interaction between researcher and collaborating organisation. In all cases the researchers thus have a high autonomy in the acquisition of scientific knowledge.

For case 1 and 3, the organisational autonomy regarding working place and working balance is assessed as medium. For both cases this is due to informal negotiation between the collaborating organisation and the researcher, but also due to the researchers own interest in being close to what is

being studied. Additionally, for case 3, the contract is more explicit and includes the expectation that the researcher "…spends the main part of the time at our office in Virum." For case 2, the organisational autonomy is assessed as high, as there are no restrictions or expectations from the collaborating organisation regarding working place and working balance.

Writing autonomy is high in all cases, as the researchers decide on what should be included in publications, and in which journals to publish their results. In all cases, the milieu has interests in certain media, however, which media to use, remains the researchers' decision.

	High autonomy	**Medium autonomy**	**Low autonomy**
Autonomy to decide on research goals	Researcher sets research goals within a negotiated overall frame.	Research goals are based upon the problems of the organisation involving the researcher.	The organisation set specific research goals.
Informal and formal	*Case1, 2 and 3*		
Autonomy in the acquisition of scientific knowledge	Researcher decides on how and what data is collected	Joint decisions are made	Decisions on data collection are made by the organisation.
Informal	*Case 1, 2 and 3*		
Autonomy to decide on working place and working balance	Researcher decides upon where to work and to what extent he will do research related work with the organisation.	Joint decisions are made continuously.	The organisation decides upon the working conditions.
Informal and formal	*Case 2*	*Case 1 and 3*	
Writing autonomy	Researcher suggests the content of publications and gives argument why certain theories etc. are chosen.	Researcher edits or re-writes publications partly or fully.	Researcher comment on drafts.
Informal	*Case 1, 2 and 3*		

Table 3: Analysis of the SEA researcher's organisational autonomy in relation to the cooperating organisation. Whether the dependence is explicated formally (in the contract) or informally in the process is indicated in the left column.

The two analysis presented in table 2 and 3 show that the cases represent predominantly Mode 3 research, which for the researchers involves high and/or medium strategic autonomy, and primarily high organisational autonomy. The Mode 3 research carried out involves a high engagement in the study field and cooperation with exchange of sources and views. At the same time the researchers retain the responsibility for directing the research and freedom to be critical. For the researcher it thus involves freedom to govern the project within a broadly given frame, which differs from the other modes of research, as shown in Figure 2 and discussed in the following.

Despite the categorisation of all three projects as predominantly Mode 3, the analysis reveals that in practice there are differences between what this involves. The differences observed are e.g. different levels of how much the researcher identifies with the study field at a personal level, as well as different levels of critical participation in the processes studied. These differences indicate that within Mode 3 many nuances exist, and that Mode 3 research does not lead to one specific research design and practice. Mode 3 research can be undertaken in various ways, depending upon the specific context including personal preferences, timing, resources etc. After having clarified what conducting Mode 3 research involves in the examples of the three cases, the next step is to analyse the potentials for research and practice.

5. What Potentials does Acting as a Change Agent have for Research and Practice?

The second part of the aim of this paper is to investigate the potentials of mode 3 research for research and practice. This is done by investigating two issues: 1) if and how being a change agent in relation to SEA influences the research process and content and 2) if and how the research and cooperation influence the organisation and its work with SEA. These two questions are treated in the following by interpreting the Mode 3 research cases in terms of influences enabled by the combination of high autonomy and high interdependence. The interpretation is based on experiences and observations of the researchers and contact persons respectively.

Potentials for research: The researchers' experience

The first analysis of the potentials for research of Mode 3 research is based on the researchers' experiences from the three cases. This section is organised around main issues of access, dialogue on direction and ownership of the research.

Access to people, processes and information

The researchers point at the potential of access in the close association with the organisations: Access to the right person at the right time and place makes it possible for the researcher to make suggestions that test hypotheses or theories. With high strategic interdependence, the researcher is provided with insight and access to follow processes in the organisation. At the same time, the researcher has high autonomy, which means that the researcher potentially can make suggestions that are relevant for practice and at the same time tests hypotheses or theories as part of the research process. An example of this potential is from case 1, where the researcher has continuously taken part in organisational processes, which has given possibilities for testing hypotheses, e.g. about the timing of decision aid put forward in theories of organisational decision-making.

At the same time the researcher is allowed to use the information independently, which may improve the research, e.g. by getting feedback on the research from a wider research community. An example of this potential is from case 2, in which the researcher was allowed to use confidential documents on assessment practice as basis for research. The confidential data was a key source for research, which included recommendations for how to improve practice. These recommendations would not otherwise be made, as no one else has interest in using this material for this purpose. The combination of interdependence and autonomy thus made it possible to publish research with a highly relevant content.

The close association with the cooperating organisation through the high strategic interdependence has also been experienced as limiting the research, when the researcher is trying to gain access in areas with opposition towards the associated organisation. For example in case study 3, the task of performing SEA of the river basin management plans, which is the topic of the research project, was tendered and won by a competing consultancy. This meant that the researcher being closely associated with a competing consultancy was excluded from studying the process. In other situations, the high organisational autonomy may make it possible for the researcher to go beyond the organisation and interact with competing organisations. Such an act may be validated by a belief that the result of it is (more) beneficial for the research project and the collaboration. This has been possible in case 2, in which the researcher has experienced being excluded from access because of her association with the respective organisations. The researcher used her autonomy and built her

own relationships beyond the cooperating organisation, emphasising her relative independence from it.

Dialogue on direction of research
The researchers point at dialogue about the direction of the research as an important potential of the Mode 3 setup. The dialogue is seen as an opportunity for enhancing the relevance to practise and society.

The high interdependence in the cases is likely to ensure a dialogue with the organisation as the organisation has interest in the output of the research. In the three cases, the dialogue has given valuable input from a practical angle to keep the project relevant to practise. The organisational autonomy means that the researcher is still free to develop the research design and secure a scientific rigour independently of the practical wishes of the organisation. In case 1 and 3 this influence has been experienced through the fact that the research results are continuously being "reality-checked" by practitioners from the organisation. In this way the researcher gets a valuable input on whether suggestions are relevant for practice.

This dialogue also poses a challenge for researchers because the researcher constantly has to balance between the interests of the organisation, scientific demands and the researcher's own interest. In case 3, for example, the organisation has clear wishes for immediately usable methodology, while the scientific community expects more time to be spent on issues such as theoretical angle and research methodology.

Ownership of outputs of autonomous research
The last influence identified by the researchers is connected to the utilisation of the results of the research projects. The Mode 3 setup is experienced to give the organisations ownership of the output of the autonomous research, meaning that the output is more likely to be used in the organisations. This support is especially relevant as the researcher - retaining the organisational autonomy - may have chosen approaches and theories that the organisation would not have preferred at first although the researcher found these more beneficial. The combinations of interdependence and autonomy may in such situations make it possible to improve research and practice by double-loop learning processes (Argyris, 1977) in the organisations. For example, case 1 is aiming at this by using theory that is not previously related to the field, and the organisation has supported the researcher's choice.

The experience from the case studies is that for the organisations, the sense of ownership is related to getting a return for their investment, cf. table 2. The organisations have invested in the research projects and have had influence on the direction of the research, so that it has relevance, and they will, if at all possible, try to benefit from it in their organisations. The organisations may even work as platforms for disseminating the research results to society and other practitioners. Case 3 is an example of this, because Rambøll will strive to implement any methodology developed, in their subsequent consultancy work, thus communicating it to their clients. The ownership and backing from the collaborating organisation is in case 2 furthermore experienced to give the output of the research a higher status among related institutions.

Potentials for practice: The organisations' experience
The organisations' responses to the questions of potentials shed light on the cooperative mode of research seen from practitioners' experiences. This section is organised around main issues arising

in the written response: The importance of linking research and practice closely; the influence observed and assessed; and the risk and weaknesses.

The importance of close linkages between SEA research and SEA practice
The respondents in general stress the importance of a close relationship between research and practice. The respondents from Energinet.dk and Rambøll e.g. express the value for SEA research as:

> *"The strength is that SEA theory is challenged by reality's diversity of asymmetrical courses and sudden political and strategic changes." (Head of Section, Energinet.dk)*

> *"Sanne gets input for understanding everyday life and problems of the practitioners. Thereby the research study adjusts to a more societal beneficial approach."(Head of Department, Rambøll)*

The contextual aspects of practice are hereby put forward as important for enhancing relevancy of SEA research, even though this does not guarantee an easy implementation in practice. The importance for SEA practise is also raised and related to the organisations' motivation for entering a Mode 3 setup. Energinet.dk chose to initiate the cooperation with Aalborg University because they wanted research input to how to practice SEA, on which plans and especially how to integrate SEA into decision making: "It has always been – and still is – the attitude in Energinet.dk, that SEA shall not be a shallow paper exercise. SEA shall enter the decision making processes at a time and with content that makes SEA an active element". The same line of motivation is found in the Self Rule who puts it this way:

> *"I like to see the units' cooperation with Anne as an expression of a greater openness to external challenges than some other units' ...Whether it can be said to be evidence that we to a higher degree operate with 'governance' administration principles, I will leave for others to objectively assess – but it is what I as manager of the unit strive for as a principle."(Head of Department, The Greenlandic Self-Rule)*

While Energinet.dk and the Self Rule emphasise both the short and long term perspectives in their views upon the importance of a close relationship between SEA practice and SEA research, Rambøll especially stresses the motivation as short-term business expansion through a competency development. On the long term Rambøll views the importance of cooperation with research for the SEA practice in general:

> *"Rambøll gets access to Aalborg University on a more personal level and thereby easier access to future sparring and development of other cooperations.". (Head of Department, Rambøll)*

The researchers' high engagement in practice is by two respondents underlined as important for the cooperative mode and the content of the research. The following statements from Energinet.dk and the Greenlandic Self Rule exemplify this and point to the importance of grounding research in an understanding of specific contextual circumstances:

> *"Ivar has from the first day shown genuine interest in the dilemmas of Energinet.dk, and has very thoroughly acquainted himself with the atypical decision processes behind a decision on large scale infrastructure projects."(Head of Section, Energinet.dk)*

> *"In relation to the societal perspective, it has been an unconditioned benefit – supposedly a precondition – for Anne, that she is an integrated part of the Greenlandic society." (Head of Department, The Greenlandic Self-Rule)*

The physical affiliation, involving staying in the environment for periods, is part of the high engagement by the researchers and is stressed as an important basis for the influence on their SEA work. The first-hand acquaintance with the actual projects and issues are mentioned as a positive consequence of physical affiliation – in addition to the possibility of involving the SEA knowledge in the processes and to challenge the work undertaken continuously. The researcher becomes integrated and "..not just an external consultant or observant" (Head of Section, Energinet.dk).

The influence observed and assessed
A general observation in the answers from the respondents is the conclusion that the close cooperation has influenced the respondents' competences through the developed understanding and actual work on SEA:

> *"On the concrete and praxis-related level, it have had great impact for progress and development of the specific SEA, that Anne has 'wafted over the water' in different matters. Anne has through the whole process been a really good sparring partner for me being responsible for the SEA." (Head of Department, The Greenlandic Self-Rule)*

Rambøll who also refers to the personal competency development, but finds it difficult to assess the direct competency development for others and the company in general supports this. The reason put forward is, that the application-oriented part of the research is not yet finished. This may have to do with the character of the company being a consultancy, and the expressed need for tool making. Energinet.dk raises the influence on the competences on a more institutional level:

> *"It has qualified the research project and brought valuable knowledge on SEA from Ivar. Several internal workshops have been held to qualify key employers within SEA. Ivar has participated in the development of internal and external minutes on SEA to be used for establishing a proper SEA policy". (Head of Section, Energinet.dk)*

And continues to stress the influence for other actors and society in general: "Energinet.dk and other authorities have a need to get the SEA processes defined and coordinated properly – in that case the project has already been of great importance".

The hidden influence, or indirect influence, for which it is difficult to establish a clear causal relationship between the research and changes in practice, is discussed as important. The respondent from Greenland explains this indirect influence - due to publication, involvement of informants and just general presence by the researcher - through examples like these:

> *"In relation to The Bureau of Minerals and Petroleum (BMP) and Anne's insistence on getting access to the (so-called) SEA's written by BMP, I think that this insistence has had an impact on the decision that BMP in January 2010 for the first time has started to publish their SEA's."*

"It is difficult to express but it has to do with a small society, and here Anne's contribution to the debate has made the media image a bit more nuanced – not on the axis advocate versus opponent, but on the axis unreflective versus reflective."

These influences are from the authors' perspective related to Mode 3 research, with the normative sight on e.g. democratic SEA processes, supplemented at times with a Mode 1 research to secure the necessary distance to keep a critical stance.

Risks and weaknesses

Working as closely as it has been the case in the three research projects can also be associated with different risks. One is that researchers do not use the synergies between the three modes of research and get too involved in the specific contextual setting with a risk of not keeping enough distance to be critical. The respondent from Energinet.dk raises this risk:

"A potential weakness in the cooperation model is if Ivar is not capable of getting the necessary distance to the experiences in Energinet.dk. If he becomes part of the processes because they are interesting, it might be difficult to keep the appropriate academic distance to the experiences… Energinet.dk has in general not experienced these weaknesses…more to consider as observation points". (Head of Section, Energinet.dk)

Another risk put forward by the respondents is the unpredictability in the research process and thereby the actual possibilities of creating synergies between practice and research. Rambøll experienced a lower degree of synergies due to lack of jobs of relevance to the research project:

"We tried to get jobs within the core of the research field, but unfortunately failed. Had we won just one of these jobs, and especially the environmental assessment of the river basin management plans, it would presumably have meant a greater involvement of Sanne in the production." (Head of Department, Rambøll)

The opposite situation was the case for Energinet.dk, since they during the research period experienced massive intake of large projects, which has given a large empirical base for the research project. These experiences raise the need to acknowledge the unpredictability in having cooperative processes, and that the benefits for SEA and the organisation as such might appear later than assumed. For Rambøll it was also an unexpected experience that the close cooperation between Rambøll and Aalborg University limited the access to the process of preparing SEA of the new RBMPs: "We were very surprised to experience, that the process was so closed, and that Rambøll's cooperation with the university and Sanne in that respect was hindering the openness of the authorities" (Head of Department, Rambøll). Still the research has a role to play, but the influence is more on the societal level than for the company as such: "…the research project can give the Danish approach to integration of climate in environmental assessments a lift…" (Head of Department, Rambøll).

Another risk mentioned, is the lack of engagement from the organisation in general. It is experienced by the respondents that a risk with the cooperative model is that only the key person is fully engaged in bridging SEA research and practice:

> *"Rambøll only benefits from the cooperation, if individuals in Rambøll have time/interest/will in getting involved in the cooperation – our conditions for this has actually not been the best." (Head of Department, Rambøll)*

In the Self Rule the cooperation has also been solely coupled to the key person, which has not given beneficial and automatic access to other parts of the organisation:

> *"Some specific conditions have meant that I have right of disposal over necessary resources and at the same time taken the necessary decision competence for the cooperation to become a reality, but I do not hold a sufficiently high position to personally spread 'the happy message' to other parts of the Self Rule. This work should have been done by others, but unfortunately no one else has taken on this task." (Head of Department, The Greenlandic Self-Rule)*

Trough examples as above it is stressed by the respondents that the members of the organisations need to be open and accessible to make a bigger difference. This is in line with the emphasis on interdependence in the Mode 3 setup.

6. Conclusion and Discussion

The article has raised the potentials of SEA research being involved in engaged knowledge making starting with the environmental problem. The point of departure has been the international questioning whether SEA is effective in influencing planning and decision-making processes in the quest for sustainable development. The authors further question whether the experienced gab between SEA research and SEA practise can be due to a scientific non- or low cooperative knowledge production. The article, based upon theories on knowledge production and empirical analysis of three cases of SEA research intervention in ongoing processes, reveals results presented and discussed in the following.

What SEA research as Mode 3 involves

The cases analysed show that Mode 3 research involves predominantly high interdependence between the researcher and the organisation, mainly in terms of economy and engagement. Also a predominantly high organisational autonomy is present, mainly related to acquisition of scientific knowledge and writing. Also there is a measure of autonomy in deciding on research goals, where in Mode 3, research goals are set through a negotiation. The cases also show that doing SEA research can involve different issues, such as different degrees of involvement. Borrowing terminology from Andrew Jamison (2009a), three roles for SEA researchers in the process of inclusiveness are shown:

1. *"Taking side":* The researcher identifies with the field of study (The Greenlandic case in which the researcher develops a kind of partisanship with the Greenlandic society possibly impacted by the drive for implementing new mega industries).

2. *"Helping out":* The researcher becomes a 'critical friend' (The Energinet.dk case in which the researcher critically participates in the processes in the organisation to find ways for SEA to influence decision making).

3. *"Giving advice"*: The researcher keeps an academic distance in advising the organisation (The Rambøll case in which the researcher gives professional input to the development of SEA of water plans and incorporation of climate change in SEA).

The three cases indicate that Mode 3 researchers work in a variety of ways. This variety may be triggered by different situations that the researchers adapt to in the process of doing research.

Potentials for Mode 3 to influence SEA research and SEA practice
The empirical analysis, based upon the experience and reflection of both the researcher and the key person in the cooperating organisations, shows that in the three cases Mode 3 influences SEA research and practice in other ways than Mode 1 and 2.

The engagement and involvement in what is being studied has developed a timely and real-life correlated understanding of the processes in which we are trying to integrate and use SEA as a means for sustainable development. The context is being brought to the forefront, which is assessed by all parties in the three cases as positive and important for research to increase relevance for SEA practice and influence this. Some of the main potentials experienced by researchers and organisations in the three cases are:

- The research mode renders possible a Critical review of planning, assessments and decision making processes, as well as of research
- The research mode furthers development of attitudes towards SEA and development of specific assessment skills within the organisations.
- The research mode assists in building bridges among actors within the organisation, and between the organisation and external actors, and eases the communication of SEA results to e.g. the public.

By cooperating on knowledge making, the researchers have also gained benefits by getting increased access to information and processes. This is assessed as improving both the quality of research, and ongoing dissemination of knowledge and research results in non-academic forum. The high autonomy in Mode 3 means that the suggestions of the researcher are likely to go beyond the assumptions and rules that govern practice in the milieu.

The overall conclusion from the study is that potentially a researcher, with high autonomy and interdependence, functions as a change agent for more environmentally sustainable decisions by being part of and influencing the field studied – without devaluing or compromising the traditional scholarship.

The challenges for Mode 3 SEA researchers and the organisations involved
Being part of Mode 3 knowledge making is experienced as challenging in different aspects. First, the researcher is putting himself 'in game'. One needs to know and recognise own knowledge, values and delimitations - and at the same time recognise others'. Second, Mode 3 research is, and needs to be, personally driven, based upon a high engagement and clarification of own values. An overall pitfall of Mode 3 research is also the balance of having a close cooperation and at the same time retaining the critical approach of a researcher. It is a challenge to have a high interdependence and at the same time maintain high autonomy, i.e. without compromising slightly with your ability or willingness to be critical to the organisation with which you are associated. For the organisation the study especially shows challenges in getting a broader organisational engagement and commitment in the SEA research.

Despite the focus on Mode 3, the analysis also shows Mode 2 and 1 characteristic in some parts of the Mode 3 research: From time to time, the researcher's work resembles a consultancy for the benefit of the cooperation and in other periods the researcher's efforts resemble traditional science in detailed studies of a specific. In addition to autonomy and interdependence, what distinguishes the Mode 3 researcher from these other modes is also the reflexivity that precedes and follows the efforts resembling other modes. In this way Mode 3 is by the authors seen as a complementary mode to doing research: Incorporating to a certain extent Mode 2 and 1 and thereby combining the benefits of modes. An issue of interest for further interest is a mapping of which modes of research is currently used by researchers in the SEA field.

The point of departure for the article is that if the SEA research society is to make a difference for practice, we need a wide and deep form of cooperation between researchers and practitioners. This cooperation can be achieved through Mode 3 research entailing co-funding, co-formulation of research questions and co-production of results. We as SEA researchers can choose to be close to the SEA practitioners, decision makers and affected parties and at the same time create temporary space of distance to the relevance demands coming from the co-operators to safeguard rigour. The contextually based Mode 3 research, and the appertaining critical pragmatism, can give us one way to minimise the gap between SEA research and SEA practice. Preconditions for this to happen prove to be personal engagement, shared wish for research to make a difference for SEA practice and dialogue with a confrontation of own research intention listening to the intentions of the society.

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AALBORG UNIVERSITET

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Erhverv og Miljøvurdering

Miljøregulering ved etablering af nye erhvervsprojekter i Grønland

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Indholdsfortegnelse

Anne Merrild Hansen, Qaqortoq, April 2008

1. Indledning

Denne rapport er udarbejdet på foranledning af Landsplanafdelingen i Departementet for Infrastruktur og Miljø, Grønlands Hjemmestyre. Første version blev udarbejdet i november 2007. Rapporten er efterfølgende tilrettet, senest i april 2008. Der er tale om en beskrivelse af natur- og miljøkrav til erhvervsprojekter i Grønland, herunder projekter indenfor råstofområdet og energiintensive erhvervsprojekter. Rapporten har særligt fokus på regler for udarbejdelse af miljømæssige konsekvensvurderinger. Desuden peges der på de forskelle der er for miljø- og naturregulering af erhvervsprojekter på de to områder.

Baggrunden for udarbejdelsen af nærværende er politisk enighed i Grønland om at arbejde for at skabe vækst og erhvervsudvikling ved dels at udvikle råstofsektoren til et bærende erhverv og dels at fokusere på etablering af store energiintensive industrier. Samtidig er det en klar politisk forudsætning at det sikres, at erhvervsaktiviteterne gennemføres på en måde der er både teknisk, sikkerheds- og miljømæssigt forsvarligt. Således har Grønland tiltrådt Espookonventionen om miljøvurdering af planer og programmer, der skal implementeres i den Grønlandske lovgivning.

I forbindelse med aktiviteter i det åbne land, er Råstofloven den lov som alle råstofaktiviteter i Grønland reguleres efter. Det gælder også i forbindelse med natur og miljø, idet den specifikke lovgivning på disse områder, undtager aktiviteter, der har med efterforskning og udvinding af råstoffer at gøre. Naturbeskyttelsesloven og miljøbeskyttelsesforordningerne gælder til gengæld for alle andre erhvervsprojekter, der ikke er omfattet af råstofloven. Myndighedsregulering af råstofaktiviteter på natur- og miljøområdet varetages af Råstofdirektoratet mens natur- og miljøregulering for øvrige erhvervsområder varetages af Direktoratet for Infrastruktur og Miljø.

Det er formålet med denne rapport, at give:

1. en oversigt over natur- og miljøkrav til erhvervsprojekter omfattet af Råstofloven
2. en oversigt over natur- og miljøkrav til erhvervsprojekter der er omfattet af Grønlands natur- og miljølovgivning
3. sammenligne natur- og miljøkrav til råstofaktiviteter og andre erhvervsprojekter
4. anbefalinger til fremtidig miljø- og naturregulering af erhvervsprojekter

Rapporten beskriver kun overordnet de internationale konventioner og kategoriseringer på natur- og miljøområdet. Det er dog relevant kigge nærmere på detaljerne i konventionernes målsætninger for at få kortlagt i hvilket omfang de muliggør/begrænser eventuelle aktiviteter, hvis et vejledende materiale til interesserede virksomheder skal udarbejdes. Rapporten beskæftiger sig alene med regelsættet og beskriver og forholder sig ikke til regulering og tilsyn af lovgivningen i praksis.

Forkortelser der anvendes i dokumentet er forklaret i en liste bagest i dokumentet. Her findes også en liste over den anvendte litteratur.

2. Resume

Der er i Grønland bred politisk enighed om at udvikle erhvervssektoren med nye storskala erhvervsprojekter, som kan bidrage til vækst i samfundet og øget økonomisk selvbærenhed, herunder at udvikle råstofsektoren til et bærende erhverv. Samtidig er det en klar politisk forudsætning at råstofaktiviteter gennemføres teknisk-, sikkerheds- og miljømæssigt forsvarligt.

I Grønland reguleres miljø- og naturhensyn ved råstofaktiviteter i medfør af Råstofloven, og de respektive love på miljø- og naturbeskyttelsesområdet undtager specifikt aktiviteter i forbindelse med råstofefterforskning og -udvinding. Det medfører bl.a. muligheden for at gennemføre råstofaktiviteter i de fredede naturområder i Grønland. Regelsættet for Råstofudvindingsprojekter er således som udgangspunkt anderledes end for andre erhvervsprojekter, der er underlagt miljø- og naturlovgivningen men ikke Råstofloven. Bortset fra adgangen til de fredede naturområder, svarer reguleringen af råstofaktiviteter på miljø- og naturområdet generelt til bestemmelserne i miljø- og naturbeskytteseslovene i Grønland. I visse tilfælde er Råstofloven mere restriktiv end den øvrige miljølovgivning, eksempelvis ved udpegning af områder, der ellers er uden beskyttelse, hvor råstofaktiviteter er reguleret af hensyn til dyrelivet. I alle faser af råstofaktiviteter er miljøvurderinger endvidere påkrævet, som en forudsætning for at kunne beskrive og vurdere forventede effekter på miljø. Det gælder under råstofefterforskningen, etablering af mine/udvinding, produktionen, nedlukningen og efter lukningen.

Det anbefales, at der udarbejdes et regelsæt for storskala erhvervsprojekter i Grønland, herunder skal det defineres hvilke aktiviteter der henhører under denne kategori. Der bør ikke stilles mindre krav til erhvervsvirksomheder der kan påvirke miljøet væsentligt end til råstofaktiviteter. Derfor bør der stilles krav om udarbejdelse af miljøvurderinger. Der kan med fordel trækkes på erfaringer fra Råstofområdet i forbindelse med udarbejdelse af procedurer og vejledning i tilknytning hertil. Der kan eventuelt indenfor lovgivningen differentieres imellem forskellige typer af projekter og det anbefales at definitionerne heraf kommer på plads, så det bliver tydeligt for virksomheder hvilke krav og forventningerne der stilles på miljøområdet i forbindelse med etablering.

Derudover bør det overvejes om forbeholdet for Grønland vedr. SEA-protokollen skal ophæves. Dette kan medføre at der kan stilles krav om udarbejdelse af strategisk miljøvurdering af planer og programmer, der skønnes at kunne få væsentlig indflydelse på miljøet, således at dette kan bidrage til et udgangspunkt for en overordnet strategisk politisk plan for udnyttelse i fremtiden. Planer om 5 miner og aluminiumsindustri må vurderes at høre under denne kategori.

3. Natur- og miljøregulering for råstofområdet

I dette afsnit beskrives natur- og miljøregulering for råstofområdet i Grønland, da råstofområdet ikke reguleres i henhold til den generelle nationale lovgivning i landet.

Al råstofaktivitet i Grønland er reguleres via en særlig råstofordning mellem Grønland og Danmark. Råstofordningen for Grønland danner ramme for det dansk/grønlandske samarbejde om administration af de mineralske råstoffer i Grønland. Alle væsentlige myndighedsfunktioner vedrørende råstofaktiviteter er samlet i Råstofdirektoratet. Der skal foreligge en tilladelse fra Råstofdirektoratet før råstofaktiviteter i Grønland kan påbegyndes. I henhold til Råstofordningen er Råstofdirektoratet således myndighed for beskyttelse af miljø og natur i forbindelse med råstofaktiviteter.

3.1 Råstofloven

Tilladelser til råstofaktiviteter gives i henhold til Råstofloven. Råstofloven er således det overordnede redskab i forhold til regulering af miljø- og naturmæssige forhold for alle råstofaktiviteter i Grønland. Omkring natur- og miljøregulering står der specifikt i Råstoflovens kapitel 10:

§ 23. *Virksomhed omfattet af tilladelser efter §§ 6 og 7 skal udføres i overensstemmelse med under tilsvarende forhold anerkendt god international praksis på området. Virksomheden skal udføres miljø- og sikkerhedsmæssigt forsvarligt, på en hensigtsmæssig måde og således, at udnyttelse foregår ressourcemæssigt forsvarligt.*

§ 24. *Landsstyret kan med respekt af lovgivning, hvorved kompetence er henlagt til andre myndigheder, fastsætte nærmere forskrifter for udførelse af virksomhed omfattet af tilladelser efter §§ 6 og 7 i og uden for det af tilladelsen omfattede område, jf. § 5, stk. 1, herunder forskrifter vedrørende tekniske, sikkerhedsmæssige, miljømæssige og ressourcemæssige forhold.*

I Naturbeskyttelsesloven angives i § 4: ”Forundersøgelse, efterforskning og udnyttelse af ikke levende ressourcer, herunder mineralske råstoffer, omfattes ikke af landstingsloven”. I Miljøforordningen angives tilsvarende i § 3, at: ”Fastsættelse af regler om beskyttelse af miljøet samt regulering af og tilsyn med forhold af miljømæssig betydning i forbindelse med forundersøgelse, efterforskning og udnyttelse af ikke-levende ressourcer i Grønland, herunder mineralske råstoffer, omfattes ikke af landstingsforordningen, men foretages fortsat på grundlag af den lovgivning, der ligger til grund for meddelelse af bemyndigelse eller bevilling til sådanne aktiviteter, samt som et led i den samlede myndighedsbehandling af disse”. Det vil sige, at natur- og miljøbeskyttelse i forbindelse med råstofaktiviteter er undtaget de respektive love/forordninger og varetages af råstofloven. Det betyder eksempelvis, at råstofaktiviteter er mulige i naturfredede områder.

Der er tolv fredede områder i Grønland, i henhold til Naturbeskyttelsesloven. Dertil kommer tretten fuglebeskyttelsesområder, hvor aktiviteter er reguleret i fuglenes yngleperiode, og en generel regulering af aktiviteter nær ved fuglefjelde og -øer. Nationalparken i Nord- og Østgrønland er langt det største af de fredede naturområder.

To af de fredede naturområder er desuden omfattet af internationale aftaler, det er:

- Nationalparken i Nord- og Østgrønland af UNESCO”s biosfæreprogram og
- Ilulissat Isfjord af UNESCO”s verdensarvkonvention.

Også Ramsarkonventionen har betydning. I følge denne er der udpeget elleve områder, som er af international økologisk betydning og hvor der skal tages særlige hensyn. Disse områder er medtaget i Råstofdirektoratets udpegning af områder, hvor råstofaktiviteter er reguleret af hensyn til dyrelivet. På miljøområdet er der tilsvarende en række internationale aftaler: Espookonventionen, Kyotoprotokollen, OSPAR, Londonkonventionen, m.fl. Bestemmelserne i disse er generelt indarbejdet i vejledninger og regulativer til råstofaktiviteter og i en modeltilladelse for olieefterforskning og -udvinding.

Råstofudnyttelsen i Grønland kan deles op i to hovedområder: hårde mineraler og kulbrinter. Begge disse områder reguleres af myndighederne for at sikre at de foregår på en sikkerheds- og miljømæssig forsvarlig måde. For så vidt angår den natur- og miljømæssige forvaltning trækker Råstofdirektoratet, i henhold til råstofaftalen af 1998 mellem staten og hjemmestyret, på videnskabelig ekspertise i Danmarks Miljøundersøgelser, der har en afdeling for arktisk miljø. I de følgende afsnit gennemgås den konkrete regulering indenfor mineralområdet og kulbrinteområdet.

Mineraler

Mineralefterforskningsselskabers aktiviteter reguleres i Grønland af "Standardvilkår for efterforskningstilladelser" og "Regelsamling for aktiviteter i felten". Feltreglerne indeholder dels et sæt generelle regler som efterforskningsselskaberne skal følge ved feltarbejde, dels regler for færdsel i vigtige områder for dyrelivet samt regler som gælder i Nationalparken i Nord- og Østgrønland samt øvrige fredede områder.

Det overordnede formål med de generelle vilkår for feltarbejde i Grønland er at feltarbejde skal udføres så:

- dyrelivet ikke unødigt forstyrres
- overflade og vegetation ikke unødigt beskadiges
- risikoen for forurening og anden skadelig indvirkning på miljøet begrænses mest muligt

Feltreglerne indeholder blandt andet retningslinjer for forhold vedr. transport i terræn, indretning af feltlejre, boringer, sprængningsarbejde og lignende.

Selskaberne kan foretage visse aktiviteter uden at skulle søge om særskilt godkendelse hos Råstofdirektoratet. Det gælder eksempelvis prøvetagning og boringer ved håndholdt udstyr. Der kan også udføres geofysiske undersøgelser uden anvendelse af eksplosive materialer uden særskilt godkendelse. Andre aktiviteter kan udføres hvis Råstofdirektoratet har godkendt dem, det gælder eksempelvis:

- anvendelse af eksplosive materialer,
- boringer med tungt udstyr,
- prøvetagning i større omfang,
- anvendelse af undersøgelsesudstyr med radioaktive kilder,
- anvendelse af køretøjer, entreprenørmateriel etc.,
- terrænregulering samt etablering af faste anlæg, installationer, bygninger og lign.

Ved godkendelse kan Råstofdirektoratet fastsætte, at bestemt udstyr og materiel ikke må anvendes eller at aktiviteterne ikke må udføres i bestemte områder og perioder.

Vigtige områder for dyrelivet

Råstofdirektoratet har udpeget områder, der betegnes som "vigtige områder for dyrelivet". Disse områder er ikke omfattet af feltreglerne, men formålet med udpegningen er at gøre selskaber opmærksomme på, at efterforskning i de områder skal udføres under særlig hensyntagen til dyrelivet. De vigtige områder for dyrelivet fremgår

af Råstofdirektoratets hjemmeside angivet på kortbilag, der er ikke tale om fredede områder i egentlig forstand, men om områder hvor råstofaktiviteter er reguleret, så der tages hensyn til forekomster af dyr i de perioder, hvor de forekommer eller er mest følsomme. En del af områderne indgår i de naturfredede områder, de øvrige er ellers uden beskyttelse i medfør af naturbeskyttelsesloven. De elleve grønlandske Ramsarområder indgår alle i de "vigtige områder for dyrelivet". De områder som er udpeget som vigtige for dyrelivet" bliver revideret løbende der kommer ny viden om dyrenes udbredelse og deres følsomme perioder.

Fredede områder
I Råstofdirektoratets feltregler er der særlige regler for aktiviteter i Nationalparken. Disse regler stemmer stort set overens med fredningsbekendtgørelsens bestemmelser. Desuden er en lang række områder udpeget som vigtige områder for dyrelivet, som beskrevet herover, herunder eksempelvis mange af de fuglekolonier, der er omfattet af Naturbeskyttelsesloven.

For en del af de fredede områder i Grønland inkl. Nationalparken gælder særlige vilkår for feltarbejde. For de fredede områder gælder, at der særskilt er fastlagt vilkår for det enkelte fredede område som tager hensyn til netop dette områdes særlige sårbarhed, og som svarer til mange af fredningsbestemmelserne.

Ferskvandsressourcer
I feltreglerne har Råstofdirektoratet opstillet særlige natur- og miljøkrav til beskyttelse af ferskvandsressourcerne. Det betyder, at de selskaber som får en efterforskningstilladelse der dækker et areal omkring en ferskvandsressource til vandforsyning skal respektere særlige restriktive krav i forbindelse med efterforskning i området.

Feltrapport
Som afslutning på mineralselskabers feltarbejde skal der indsendes en såkaldt feltrapport til Råstofdirektoratet. Feltrapporten skal blandt andet omfatte informationer om efterforskningens stadie, lokalisering af boringer og prøvetagning. Desuden skal feltrapporten indeholde oplysning om arbejdernes indkvartering og transport. Også emner af mere miljømæssig karakter skal beskrives, som eksempelvis behandling af affald, skade på vegetation eller jordbund og eventuelle aktiviteter i områder og perioder af særlig betydning for dyrelivet. Desuden skal selskabet oplyse om der er oplagret materiel og udstyr i felten, lokaliteten for oplagringen og hvilke mængder der er efterladt. Råstofdirektoratet skal godkende eventuelt efterladt udstyr. Feltrapporterne indgår som en del af de data som Råstofdirektoratet samler i forbindelse med efterforskningen.

Udnyttelsestilladelse
I forbindelse med behandling af en ansøgning om udnyttelsestilladelse skal der gennemføres et omfattende arbejde af ansøger og myndigheder med tilknyttede rådgivere. Et baselinestudie i 2-3 år skal beskrive områdets miljøtilstand samt anbefalinger og krav til indretning af udnyttelsesvirksomheden – dette er nærmere beskrevet under afsnittet om miljøvurdering af råstofprojekter. Dette med henblik på, at sikre den bedst mulige beskyttelse af miljø og natur før, under og efter minens levetid. Dette fremgår af "Standardvilkår for en udnyttelsestilladelse". Det er således et krav for behandling af en ansøgning om godkendelse af udnyttelsesvirksomhed efter Råstoflovens § 10, at der foreligger en gennemarbejdet VVM. Denne vurdering vil være grundlag for såvel ansøgerens forslag som myndighedernes krav til tilrettelæggelse af minens opbygning, drift og nedlukning. Vurderingen skal blandt andet omfatte:

- En beskrivelse af områdets miljøtilstand og karakteristika *før* minedrift påbegyndes; herunder også samfundsmæssige aspekter som fangst- og fiskerivirksomhed samt områdets rekreative betydning,

- En beskrivelse af de væsentligste påvirkninger af miljøet ved udnyttelsesvirksomheden. Forslag til foranstaltninger før, under og efter minens levetid som skal sikre at påvirkning af miljøet undgås eller væsentligt reduceres. Herunder blandt andet håndtering af gråbjerg og "tailings" samt foranstaltninger til beskyttelse af miljø og natur ved evt. uheld.
- Forslag til retablering af området efter minedriften med det mål, såvidt muligt at bringe området tilbage til sin naturlige tilstand. Der foreligger forskellige modeller, forslag og vejledninger for hvorledes der gennemføres natur- og miljøbeskyttelse i forbindelse med minevirksomhed.

Råstofdirektoratet samt samarbejdspartnere anvender disse ud fra et krav om best practice i forhold til internationalt anerkendte metoder og niveauer i natur- og miljøbeskyttelse. Der foreligger ikke regelsæt eller lignende som umiddelbart kan "importeres" og anvendes på et givet udnyttelsesprojekt. Dette afspejler, at miljøbeskyttelse i forbindelse med minevirksomhed altid vil skulle tilrettelægges individuelt i forhold til den enkelte mine. De væsentligste årsager hertil er blandt andet at mineraliseringsmønstret og dermed forureningspotentialet altid vil være specifikt for den enkelte forekomst, at det fysiske miljø for minedrift, oparbejdning af malm og udskibning vil variere meget fra sted til sted samt at der ofte vil være særlige lokale hensyn at tage til dyre- og planteliv samt menneskelig brug af stedet. Endelig er det værd at nævne, at der er sket en markant udvikling i kravene til miljøbeskyttelse ved minevirksomhed over de seneste årtier. Natur- og miljøkravene bliver stadigt højere, ligesom kravene til den forurenende part, det vil sige selskabet skal finansiere alle miljøbeskyttelsesforanstaltninger, bliver stadigt tydeligere. Ikke mindst af hensyn til sårbarheden af det arktiske miljø tilstræber Råstofdirektoratet et meget højt niveau i miljøbeskyttelsen ved minevirksomhed.

Kulbrinter

Forundersøgelser reguleres efter Råstofdirektoratets *Standardvilkår for forundersøgelser* og efterforsknings- og udvindingsaktiviteter efter den netop reviderede modeltilladelse. Det fremgår at alle de konkrete aktiviteter skal godkendes af myndighederne inden de indledes. Desuden indgår en vejledning til ansøgning om godkendelse af havanlæg til efterforskning af kulbrinter samt feltregler og seismiske undersøgelser der reguleres af regelsættet "Seismic survey standards for offshore Wets Greenland".

Godkendelsesgrundlaget er arbejdsprogrammer for blandt andet seismiske undersøgelser, boringer, udbygninger, produktion m.m. Ud over en generel beskrivelse af det samlede arbejde og hvordan det tænkes udført, indeholder disse en miljøvurdering af aktiviteterne, sikkerhedsplaner, miljøbeskyttelsesplaner, beredskabsplaner og alarmeringsplaner. Eksempelvis for hvordan man vil forholde sig overfor store isfjelde på vej imod boreskibet/platformen. Råstofdirektoratets feltregler gælder specifikt for mineralaktiviteter, men bestemmelserne anvendes også i forbindelse med kulbrinteaktiviteter.

Miljøvurdering

Miljøvurderingen EIA (environmental impact assessment) skal svare til den danske VVM redegørelse (Vurdering af Virkninger på Miljøet). Den skal udarbejdes inden de enkelte aktiviteter sættes i gang og er en vurdering af aktivitetens virkning på omgivelsernes natur og miljø. Vurderingen omfatter såvel virkningen af den daglige drift som virkningen af eventuelle uheld på både det biologiske miljø og det fysiske miljø. Ved meget store arbejder, f.eks. opbygningen af et oliefelt, skal virkningerne på samfundet også vurderes.

Miljøbeskyttelsesplan
Miljøbeskyttelsesplanen skal angive retningslinjer som selskaber skal følge i det daglige arbejde, så virkningen på miljøet begrænses til det som er myndighedsgodkendt. Planen beskriver hvilke typer ikke naturligt forekommende stoffer det er tilladt at anvende samt hvordan man vil behandle spildevand, affald, kemikalier, brændstoffer, boremudder osv. Desuden hvordan man vil oprense mindre driftsbetingede spild af brændstof og olie, udbedre terrænskader, og hvordan man vil skåne sårbare områder og dyreliv mv.

Beredskabsplan
Beredskabsplanen for oliespild skal angive hvordan eventuelle større oliespild vil blive bekæmpet. Mindre spild håndteres af selskabet med oprensningsudstyr placeret centralt og hensigtsmæssigt i forhold til boringen. Ved større spild inddrages

- ud over det ansvarlige selskab
- særligt kvalificerede internationale beredskabsfirmaer samt myndigheder i de lande, der evt. kan blive påvirket

Bekæmpelse af et stort oliespild er en omfattende opgave, hvor flere instansers indsats skal koordineres. En nøje planlægning er derfor nødvendig hvis indsatsen skal være effektiv. Myndighedernes indsats tilrettelægges via en aktionskomite som omfatter relevante offentlige instanser.

Seismiske undersøgelser
Seismiske undersøgelser reguleres af regelsættene "Seismic survey standards for offshore West Greenland". Det fremgår af regelsættet at tilladelseshaveren forud for undersøgelserne skal fremsende en ansøgning herom til Råstofdirektoratet, som gennemgår de planlagte operationer. Ansøgningen skal bl.a. indeholde:

1. en beskrivelse af operationsplanen,
2. en foreløbig VVM,
3. sikkerhedsplan, miljøbeskyttelsesplan samt beredskabsplaner.

VVM og miljøbeskyttelsesplan skal være baseret på Danmarks Miljøundersøgelsers "Preliminary Environmental Impact Assessment of Regional Offshore Seismic Surveys in Greenland" som blandt andet beskriver hvordan påvirkninger fra intensive seismiske undersøgelser kan mindskes ved at tilrettelægge aktiviteterne sådan at særligt følsomme områder og tidspunkter friholdes for aktivitet.

Havanlæg
Råstofdirektoratet har udarbejdet en vejledning til ansøgning om godkendelse af havanlæg til efterforskning af kulbrinter i Grønland, med specielt fokus på kravene til Health, Safety and Environment (HSE). Vejledningen belyser hvilke krav myndighederne stiller til opfyldelse af god international praksis på området og hvad der anses for miljø og sikkerhedsmæssigt forsvarligt og hensigtsmæssigt i forbindelse med godkendelse af tilladelse til, at anvende et havanlæg til efterforskning af kulbrinter.

Det er et krav, at der forud for iværksættelse af en efterforskningsboring fremsendes en ansøgning til myndighederne om at udstede en boretilladelse. I ansøgningen skal det specificeres hvordan operationen planlægges gennemført i overensstemmelse med god international praksis på området, herunder HSE-organisation, sikkerheds- og kontrolsystemer, bemanding, arbejdsprocedurer, vejr- og isvarslingssystemer samt beredskabsplaner. Ansøgningen skal desuden indeholde en miljøvurdering (VVM) af den planlagte aktivitet.

I forbindelse med boringens forberedelse og gennemførelse skal der med regelmæssige intervaller blive gennemført et myndighedstilsyn med henblik på at sikre at

boretilladelsens betingelser efterleves samt at operatørens sikkerheds- og kontrolsystemer fungerer tilfredsstillende. Operatørens oliespildsberedskabsplaner skal som minimum omfatte beskrivelser af organisation, bemanding, alarmerings- og varslingsprocedurer, bekæmpelsesstrategier og placering af udstyr, etablering af kommunikation, angivelse af hvordan eventuelle større oliespild vil blive inddæmmet og oprenset, procedurer for bortskaffelse af opsamlet olie, overvågning af spildets udbredelse, kystbeskyttelse og kystoprensning. Der skal desuden i samarbejde med myndighederne udvikles en langsigtet moniteringsplan til at overvåge oliekoncentrationer og effekter i miljøet i tilfælde af et oliespild. I forlængelse af rettighedshaverens beredskabsansvar har det offentlige ligeledes etableret et myndigheds beredskab, som træder sammen, såfremt der skulle ske et uheld. Myndighedsberedskabet består af politiet, Grønlands Kommando, Søfartsstyrelsen, Rigsombudsmandinstitutionen, det generelle beredskab i Grønlands Hjemmestyre samt Råstofdirektoratet.

Modeltilladelse
Råstofdirektoratet har udarbejdet en modeltilladelse med standardvilkår for alle tilladelser. Modeltilladelsens generelle vilkår omfatter bestemmelser vedrørende den af tilladelsen omfattede periode, andres virksomhed i tilladelsens område, regulering af tekniske og miljømæssige forhold, aftaler om videreuddannelse, procedurer for godkendelse af aktiviteter, tilsyn, forpligtelser ved virksomhedens ophør, rapportering, arbejdskraft og leverancer, samarbejdsaftale mellem tilladelseshaverne, overdragelse af tilladelse, forsikring og garantier, forpligtelser ved tilladelsens ophør m.m.

Modeltilladelsen fastlægger i en række paragraffer HSE-kravene i forbindelse med udøvelse af aktiviteter inden for rammerne af en efterforsknings- og udnyttelsestilladelse. I den forbindelse kan det bl.a. nævnes, at rettighedshaveren skal fremsende planer for virksomheden, herunder:

- efterforskningsplaner,
- sundheds-, sikkerheds- og miljøplaner,
- planer for socioøkonomiske undersøgelser,
- udbygningsplaner,
- produktions-, lagrings og transportplaner,
- afviklingsaktivitetsplaner

Alle planer skal omfatte et beredskab for oliespild. En aktivitet må ikke iværksættes, uden at Råstofdirektoratet har meddelt deres godkendelse. Ved godkendelsen kan Råstofdirektoratet vælge at fastsætte krav om, at bestemt udstyr og materiel ikke må anvendes eller at aktiviteterne ikke må udføres i bestemte områder og perioder. Tilsvarende kan Råstofdirektoratet pålægge rettighedshaveren at foretage monitering af biologiske og fysiske forhold vedrørende områder der berøres af aktiviteterne. Det fremgår desuden at: ”Såfremt rettighedshaverens aktiviteter frembyder fare for personer eller anden mands ejendom, eller såfremt risikoen for forurening eller skadelig indvirkning på miljøet og sundheden overstiger det efter Råstofdirektoratets skøn acceptable, kan Råstofdirektoratet påbyde rettighedshaveren at iværksætte de nødvendige ændringer af disse aktiviteter indenfor en af Råstofdirektoratet fastsat tidsfrist. Såfremt Råstofdirektoratet finder det nødvendigt, kan Råstofdirektoratet endvidere påbyde rettighedshaveren at indstille arbejdet helt eller delvist, indtil rettighedshaveren har gennemført de nødvendige ændringer af aktiviteterne. Råstofdirektoratet kan endvidere pålægge rettighedshaveren i rimeligt omfang at udbedre eventuelle miljø- og sundhedsmæssige skader, som er omfattet af rettighedshaverens ansvar.”

Preliminær VVM
I forbindelse med 2004 udbudsrunden af olieefterforskningslicenser er der, som en del af det officielle udbudsmateriale udarbejdet en såkaldt foreløbig miljøvurdering for hvert af de fire udbudsområder. Disse foreløbige miljøvurderinger er udarbejdet af Danmarks Miljøundersøgelser og udgør grundlaget for de baggrundsstudier (baseline studies) og VVM-studier, alle selskaber skal udføre inden aktiviteter kan godkendes.

De foreløbige VVM'er indeholder beskrivelser af:
- det fysiske miljø,
- økologiske forhold & fiskeri,
- hvordan forventede efterforskningsaktiviteter kan påvirke miljøet,
- natur- og miljøpåvirkninger fra seismiske operationer,
- natur- og miljøpåvirkninger fra efterforskningsboringer,
- miljøpåvirkninger fra oliespild,
- regulering, monitering og minimering af de mulige natur- og miljøpåvirkninger,
- lokal ressource udnyttelse,
- aktiviteter i vinterperioden,
- indsamling af yderligere data

Også andre officielle og miljørelevante materialer blev lavet i forbindelse med udbudsrunden heriblandt: Danmarks Miljøundersøgelsers "Atlas over grønlandske havområder og fjorde, som er særlige følsomme overfor olieforurening". Danmarks Meteorologiske Institut og Råstofdirektoratet s "Weather, sea and ice conditions offshore West Greenland – focusing on new license areas 2004" vedrørende klima, hav og is forhold i udbudsområderne og det omkringliggende havområde.

I Råstofdirektoratets feltregler er der særlige regler for aktiviteter i det fredede område. Disse regler svarer stort set til fredningens bestemmelser. Hele området er desuden udpeget som vigtigt område for dyrelivet.

4. Natur- og miljølovgivning i Grønland

I det følgende beskrives national lovgivning, som regulerer miljøområdet i Grønland, og hermed udgør grundlaget for de natur- og miljøkrav der (kan) stilles til erhvervsvirksomheder, der ønsker at etablere sig i Grønland.

4.1 Naturbeskyttelsesloven

Egentlig national naturfredning varetages ved "Landstingslov nr. 29 af 18. december 2003 om naturbeskyttelse". I medfør af denne lov udstedes bekendtgørelser omkring de specifikke fredninger. Fredninger foretaget i medfør af den tidligere naturfredningslov eller af Grønlands Landsråd er stadig gældende. § 4 nævner: "forundersøgelse, efterforskning og udnyttelse af ikke levende ressourcer, herunder mineralske råstoffer, omfattes ikke af landstingsloven".

IUCN (The World Conservation Union) kategoriserer nationale naturfredninger i seks forskellige beskyttelseskategorier. WPCA (World Commission on Protected Areas under IUCN) angiver, at efterforskning og udvinding af mineralske ressourcer ikke er forenelig med formålene for beskyttelseskategorierne, og henviser til at råstofaktiviteter bør være forbudt i fredede områder med denne klassifikation. I områder med de to laveste beskyttelseskategorier vil efterforskning og lokaliseret udvinding kunne accepteres, hvis

det er foreneligt med formålene for de beskyttede områder, og kun efter gennemførelsen af en VVM og ved anvendelse af *best practices* indenfor miljøbeskyttelse.

Kategoriseringssystemet giver altså mulighed for råstofaktiviteter i de to laveste beskyttelseskategorier, mens andre "blødere" erhverv som f.eks. turisme er muligt i bufferzoner til andre kategorier. De fleste af de grønlandske fredninger hører til i de højere kategorier. IUCN understreger dog også, at det er et nationalt anliggende om man vil tillade råstofaktiviteter i naturbeskyttede områder. Hvis det tillades, som i Grønland, er det dog ikke muligt at anvende IUCN's klassifikation. Det skal i øvrigt her nævnes at IUCN er i dialog med *International Council on Mining & Metals* vedrørende muligheden for råstofaktiviteter i flere af de forskellige kategorier. Biodiversitetskonventionen, som er tiltrådt af Grønland, anbefaler at IUCN's kategoriseringer anvendes. Der er således en aktuel konflikt imellem de tiltrådte og gældende regler for området.

Det vil sige at råstofaktiviteter er mulige hvis landskabelige værdier og lokal bæredygtig udnyttelse af biologiske ressourcer ikke påvirkes af aktiviteterne og, hvis de kan holdes indenfor begrænsede områder. Bliver denne kategorisering fulgt vil det være muligt at eventuelle erhvervsaktiviteter kunne foregå efter udarbejdelse af VVM, både for råstofområdet og andre for andre industrier/erhverv.

I henhold til Naturbeskyttelseslovens § 41 skal der i dag også foretages naturkonsekvensvurderinger før eventuel aktivitet kan sættes i værk indenfor et fredet område. Ifølge § 42 er aktiviteter der hjemles efter råstofloven undtaget, men råstofaktiviteter skal så miljøkonsekvensvurderes i forbindelse med myndighedsbehandling af aktivitetsansøgninger.

4.2 Miljøforordningen

I Grønland gælder "Lov nr. 850 af 21. december 1988 for Grønland om miljøforhold m.v.". I henhold til loven er der udstedt to landstingsforordninger: Nr. 12 af 22. december 1988 om beskyttelse af miljøet, Miljøforordningen er senere ændret fire gange. Samt nr. 4 af 3. november 1994 om beskyttelse af havmiljøet. Havmiljøforordningen er senere ændret i 1997 og 2004. I medfør af miljøbeskyttelsesforordningen er der desuden vedtaget nogle bekendtgørelser.

I Miljøforordningen angives i § 3: "Fastsættelse af regler om beskyttelse af miljøet samt regulering af og tilsyn med forhold af miljømæssig betydning i forbindelse med forundersøgelse, efterforskning og udnyttelse af ikke-levende ressourcer i Grønland, herunder mineralske råstoffer, omfattes ikke af landstingsforordningen, men foretages fortsat på grundlag af den lovgivning der ligger til grund for meddelelse af bemyndigelse eller bevilling til sådanne aktiviteter, samt som et led i den samlede myndighedsbehandling af disse". I § 3 stk. 2, i ændringen fra 1993 tilføjer: "Fastsættelse af regler om beskyttelse af miljøet samt regulering af og tilsyn med forhold af miljømæssig betydning i forbindelse med de i stk. 1 nævnte forhold foretages dog på grundlag af denne forordning i de tilfælde, hvor dette ikke sker i henhold til den i stk. 1 nævnte lovgivning."

I bemærkningerne til § 7, stk. 1, nr. 15 (vurderinger af større anlægs virkninger på miljøet) står der følgende om Espookonventionen: I § 7, stk. 1, nr. 15, er der hjemmel til, at Landsstyret kan fastsætte regler om vurdering af større anlægs virkninger på miljøet (VVM). Bestemmelsen implementerer Espookonventionen om miljøvurdering af anlæg, der formodes at have grænseoverskridende miljøvirkninger, således at negative miljøvirkninger mindskes eller bekæmpes gennem en forebyggende miljøindsats. Espookonventionen stiller krav om, at der gennemføres miljøkonsekvensvurderinger af en række oplistede anlæg, bl.a. kemiske anlæg, større kraftværker, minedrift og offshore

produktion. Konventionen indeholder også bestemmelser om, at disse anlægs miljøvirkning skal offentliggøres og debatteres i fuld offentlighed. Espookonventionen blev tiltrådt af Grønland i 1993, og bestemmelsen skal fortsat anvendes til at fastsætte regler i overensstemmelse med konventionen. Bestemmelsen giver dog også mulighed for, at der stilles krav om vurdering af virksomheders og anlægs miljømæssige virkninger internt i Grønland.

Ved projektering af større anlæg bør en VVM suppleres med en naturkonsekvensvurdering efter § 43 i Landstingslov nr. 29 af 18. december 2003 om naturbeskyttelse. Landsstyret arbejder aktuelt for at udstede en bekendtgørelse, hvori der fastsættes regler om vurdering af større anlægs virkning på miljø og natur under et."

Til havs omfatter den grønlandske lovgivning havet ud til tre sømil fra søterritoriets basislinie. Havmiljøforordningen indeholder bl.a. et forbud imod udtømning af olie (§ 8), et forbud imod udtømning af affald (§ 17) og et forbud imod dumpning (§ 19). Udenfor tremilegrænsen, gælder den danske "Lov om beskyttelse af havmiljøet" (Lov nr. 476 af 30. juni 1993 og lov nr. 921 af 25. november 1992) med en række senere ændringer. Den danske lov gælder i Grønland ved anordning nr. 1012 af 15. december 1994 om ikrafttræden for Grønland af lov om beskyttelses af havmiljøet. I henhold til § 2 varetages myndighedsbeføjelserne og myndighedsopgaver i tilknytning til råstofaktiviteter i Grønland (udenfor tremilegrænsen) af energiministeren, og fra 1998 af Råstofdirektoratet som led i den samlede myndighedsbehandling af råstofaktiviteter i henhold til Råstofloven.

4.3 Fortidsmindeloven

Landstingslov nr. 5 af 16. oktober 1980 om fredning af jordfaste fortidsminder og bygninger, kaldes også fortidsmindeloven. Fortidsmindeloven freder generelt *jordfaste fortidsminder* og området omkring i en afstand af 20 meter. Der er desuden en række fortidsminder som er specifikt fredet ved bekendtgørelser og cirkulærer.

Der kan altså ikke foregå hverken råstofaktiviteter eller andre aktiviteter i områder omfattet af Fortidsmindeloven. Danmarks Miljøundersøgelser har foreslået i deres rapport nr. 524 om Råstofudvinding og miljøhensyn, at Grønlands Nationalmuseum og Arkiv foretager en udredning omkring råstofaktiviteter og beskyttelseshensynene til de grønlandske fortidsminder. I modsætning til miljøloven og naturbeskyttelsesloven, undtager fortidsmindelovgivningen nemlig ikke råstofaktiviteter.

5. Internationale natur- og miljøaftaler gældende i Grønland

I dette afsnit beskrives de internationale natur- og miljøaftaler som Grønland er tiltrådt, da disse på linje med den nationale lovgivning har regulerende og opsættende virkning for erhvervsmulighederne i Grønland.

5.1 Espookonventionen, SEA protokollen og Århuskonventionen

Espookonventionen (Convention on Enviromental Impact Assessment in a Transboundary Context) er en rammekonvention om vurdering af virkningerne på miljøet på tværs af landegrænser. Konventionen blev først vedtaget i 1991. Konventionen er udarbejdet i UN/ECE-regi, men er ment som en global konvention, der trådte i kraft 10.09.97. Konventionen er i 2003 suppleret med en protokol om strategisk miljøvurdering (SEA-protokollen af 21. maj 2003, Kiev, Ukraine).

Danmark underskrev Espookonventionen den 26. februar 1991 og ratificerede konventionen i 1997. I alt 38 europæiske lande, Canada og EU har ratificeret. Danmark tog ved underskrivelse i 1991 forbehold for Grønland og Færøerne. Forbeholdet for Grønland blev ophævet i 1993. Danmark underskrev SEA protokollen, der knytter sig til Espookonventionen, i 2003, med forbehold for Grønland og Færøerne. Dette forbehold er stadig gældende. På trods af at Grønland ikke er underlagt SEA protokollen beskrives den alligevel her sammen med Århuskonventionen, der ligeledes er relevant, for at give et billede af de muligheder der er for Grønland i relation til miljøvurdering af erhvervsprojekter.

Espookonventionens formål er at sikre gennemførelsen af vurderinger af virkninger på miljøet ved større anlæg og projekter. Dette gælder for projekter hvis aktivitet antages at have en væsentlig skadelig virkning på miljøet på tværs af landegrænser, således at disse mildnes, mindskes og bekæmpes gennem en forebyggende miljøindsats. Desuden er der lagt vægt på, at det sundhedsmæssige aspekt inddrages, og at der arbejdes for en bæredygtig udvikling.

Der er lister over anlæg, hvor der skal gennemføres en miljøkonsekvensvurdering, som blandt andet omfatter råolieraffinaderier, store kraftværker, kernekraftværker, stålværker, kemiske anlæg, olie- og gasledninger i store diametre, store anlægsbyggerier, minedrift og offshore-produktion m.v. Konventionen kræver, at en planlagt aktivitet af en potentiel skadelig art, skal kommunikeres til parterne, og denne aktivitets miljøvirkninger debatteres i fuld offentlighed. Konventionen indeholder endvidere mekanismer for den situation, at parterne ikke når til enighed. Blandt andet stop af aktiviteten. Konventionen planlægges implementeret i Grønland af Departementet for Infrastruktur og Miljø i 2009 ved udarbejdelse af en VVM- bekendtgørelse.

Formålet med en SEA protokol under Espookonventionen er at sikre et højt miljøbeskyttelsesniveau landene imellem. Dette ved sikring af, at der gennemføres en miljøvurdering af visse planer og programmer, der måtte få virkninger for miljøet samt at sikre, at borgerne inddrages i denne proces i overensstemmelse med Århuskonventionens principper, Århuskonventionen beskrives senere i dette afsnit. SEA protokollens forpligtelser kan opdeles i tre områder:

1) Generelle bestemmelser om bistand og vejledning til offentligheden, anerkendelse af og støtte til relevante foreninger, fremme af protokollens mål internationalt, og forpligtelse til at sørge for, at personer, der udøver deres rettigheder i henhold til protokollen, ikke bliver straffet eller udsat for diskriminering på grundlag af statsborgerskab el. lign.

2) Bestemmelser for miljøvurdering af visse planer og programmer. Disse kan opdeles i to grupper. Den ene gruppe beskæftiger sig med de emner, det er obligatorisk at foretage miljøvurderinger af planer og programmer for. Eksempelvis større installationer til produktion af stål, olie og gas pipelines og kraftvarmeværker. Den anden del fastsætter, at et land kan foretage miljøvurderinger af planer og programmer på områder, hvor det skønnes sandsynligt, at der vil være væsentlige virkninger.

3) Forpligtigelse af parterne til at bestræbe sig på at sikre, at miljøhensyn, iagttages og integreres i rimeligt omfang, når de udformer politikker og lovgivning, der kan antages at have væsentlig virkning på miljøet. Artiklen er ikke bindende.

Århuskonventionen omhandler adgang til oplysninger, offentlig deltagelse i beslutningsprocesser samt adgang til klage og domstolsprøvelse på miljøområdet.

Århuskonventionen er som SEA protokollen tiltrådt af Danmark med forbehold for Grønland.

Århuskonventionen fastsætter retningslinier for offentlighedens adgang til miljøoplysninger, til at deltage i miljøbeslutninger og adgang til at klage over og få prøvet en sådan klage ved domstolene. Konventionen indeholder hvad der bedst beskrives som en "aktiv oplysningspligt" for myndighederne i forhold til miljøspørgsmål, og spørgsmål der i bred forstand relaterer sig hertil. Konventionen fastslår, at myndighederne har pligt til at indsamle aktuelle miljøoplysninger og til aktivt at arbejde for, at oplysningerne bliver lettere tilgængelige for offentligheden, eksempelvis via elektroniske databaser over miljølovgivningen, miljørapporter, kommuneplaner og affaldsplaner. Myndighederne skal aktivt informere borgerne om, at disse informationer er tilgængelige. Århuskonventionen lægger også op til, at miljøorganisationer skal have mulighed for at optræde som klager i det administrative klagesystem såvel som ved domstolene.

Århuskonventionens anbefalinger kan indarbejdes i landstingsforordning om beskyttelse af miljøet, ved at kredsen af klageberettigede udvides i § 41, nr. 4, med omfattende foreninger og organisationer, der har til formål at varetage væsentlige rekreative interesser. En egentlig implementering af konventionen vil være betinget af en indarbejdelse af de øvrige standarder i grønlandsk lovgivning også.

5.2 Ramsarkonventionen

Danmark underskrev denne konvention i 1977 på vegne af rigsfællesskabet, og dermed Grønland. Det er en aftale om beskyttelse af levesteder for dyr og planter. Konventionen lægger op til beskyttelse, forvaltning og *wise use* af vådområder af international økologisk betydning

De underskrivende lande er forpligtet til at udpege mindst et Ramsarområde. Ramsarområder udpeges efter en række kriterier. I 1987 udpegede Grønland 11 områder. Udover disse områder angiver konventionen at de underskrivende lande generelt skal beskytte og forvalte landets andre vigtige vådområder.

Ramsarområderne skal implementeres i den lokale nationale fredningslovgivning. Departementet for Infrastruktur og Miljø arbejder på forvaltningsplaner og fredning af flere af Ramsarområderne. Konventionen giver mulighed for at revidere udpegede områder, hvis de viser sig ikke at leve op til udpegningskriterierne eller hvis der er vigtige nationale hensyn der taler for det. Revideres områder så de ikke længere er kategoriserede som Ramsarområder, så skal der udpeges erstatningsområder.

Som nævnt omhandler Ramsarkonventionen beskyttelse af levesteder. Aktiviteter der ikke ødelægger levestederne og som omfattes af begrebet *wise use*, kan tillades. Danmarks Miljøundersøgelser vurderer i *Rapport nr. 524 Råstofaktiviteter og natur- og miljøhensyn i Grønland*, at aktiviteter som dem der kan accepteres i IUCN's laveste kategorier også er mulige indenfor Ramsarområder. Det vil sige aktiviteter der gennemføres under anvendelse af *best practice* og som underlægges en VVM for alle projektets faser (opstart, drift og monitorering). Aktiviteter der decideret skader udbredte levesteder for dyr og planter, kan eventuelt tillades, hvis der udpeges erstatningsområder. Sidstnævnte skal vurderes specifikt i hvert enkelt tilfælde.

Råstofaktiviteter kan således foregå, når der udarbejdes VVM. I princippet kan også andre erhvervsaktiviteter foregå indenfor Ramsarområder. For disse stilles ikke krav om miljøvurdering.

5.3 Biosfæreområder

Biosfæreområder udpeges i henhold til et program under UNESCO. Biosfæreområdet forvaltes af Direktoratet for Natur og Miljø under Grønlands Hjemmestyre.

Nationalparken i Nord- og Østgrønland har status som biosfæreområde. I et biosfæreområdes kerneområder vil råstofaktiviteter ikke være mulige. I bufferzonerne vil aktiviteter der ikke ødelægger naturgrundlaget være mulige – f. eks. turisme. Råstofaktiviteter vil kunne gennemføres hvis de ikke er i modstrid med beskyttelsesformålet i det kerneområde, bufferzonerne ligger udenom. Det vil sige at lokaliserede og hensynsfulde aktiviteter kan gennemføres i perioder hvor kerneområdet ikke er følsomt – typisk om vinteren. I overgangsområderne vil hensynsfulde råstofaktiviteter, ligesom de er mulige i de mindst beskyttede fredningskategorier fra IUCN's, kunne gennemføres, det vil sige, at de skal være lokaliserede, de skal være regulerede efter *best practice* procedurer og de skal undergå en VVM.

Direktoratet for Miljø og Natur har tidligere påpeget, at formålet med Nationalparken og formålet med et biosfæreområde er modstridende, fordi Nationalparken skal bevare områdets naturtilstand, og der skal tilstræbes størst mulig beskyttelse af landskab, plantevækst, dyreliv, fortidsminder og andre kulturlevn, mens et biosfæreområde har til formål at kombinere økonomisk udvikling og naturbeskyttelse.

I 1995 blev en ny strategi vedtaget for biosfæreområderne (Sevilla-strategien). Denne understreger især den menneskelige dimension, idet der lægges vægt på udvikling af bæredygtige aktiviteter i overgangsområderne til gavn for de lokale beboelser.

5.4 Verdensarvkonventionen

I juli 2004 blev Ilulissat Isfjord optaget på listen over verdensarvområder under UNESCO. Grønland er herved forpligtet til at beskytte områdets unikke natur og til at forvalte området så naturværdierne ikke trues, og råstofaktiviteter er ikke forenelige med en status som verdensarvsområde. Som forberedelse til nomineringen blev området fredet i 2003 i medfør af Naturbeskyttelsesloven. IUCN indgik i 2003 en aftale med International Council on Mining & Metals (ICMM – en sammenslutning af 15 store mineselskaber) om ikke at foretage efterforskning og udvinding af mineraler i Verdensarveområder.

5.5 FN's konvention om klimaændringer og Kyoto protokollen

Klimakonventionens protokol om reduktion af udledning af drivhusgasser, Kyoto-protokollen, er ratificeret af Danmark. Grønland har tilsluttet sig Danmarks ratifikation og har dermed forpligtiget sig til at arbejde for en reduktion i udledningen af bl.a. kuldioxid. Grønland og Danmark indgik i 2001 en rammeaftale for perioden 2008-2012, der er Kyotoprotokollens forpligtigelsesperiode. I rammeaftalen åbnes med følgende op for en genforhandling: *I tilfælde af, at der inden udløbet af den første forpligtigelsesperiode 2008-2012 etableres væsentlig emissionsbidragende virksomhed i eller omkring Grønland, herunder udvinding af olie, gas og/eller mineraler, og som dermed gør det vanskeligt for Grønland at leve op til en reduktionsforpligtigelse på 8 %, skal dette følges op af en særskilt forhandling".*

Ved etablering af industri i Grønland som medfører væsentlige CO2 udslip vil reduktionsforpligtelsen på 8 % vanskeligt vil kunne indfries. Såfremt det ikke lykkes Grønland at forhandle en undtagelse fra Kyoto protokollen på plads, kan et nødvendigt alternativ blive at købe CO2 kvoter. Prisen for kvoter vil være afhængigt af markedsudviklingen.

6. Opsamling, konklusion og anbefalinger

Det overordnede og generelle indtryk af natur- og miljølovgivning i Grønland er at regelsættet befinder sig på højt internationalt niveau. Også råstoflovgivningen varetager miljø- og naturregulering på tilsvarende højt niveau.

På trods af det høje lovgivningsmæssige niveau, er det vanskeligt at få et tydeligt og samlet overblik over de nuværende krav til erhvervsprojekter i Grønland. Dels på grund af en vis fortolkningsfrihed og dermed mulighed for forvirring i henhold til begreber og kategoriseringer. Dels pga. uens regler for råstofaktiviteter og øvrige erhverv.

I den følgende tabel er der samlet op på den regulering der er beskrevet i rapporten. I tabellen er det vist hvilke aktiviteter der kan foregå i forskellige typer områder i Grønland.

	Råstofaktiviteter	**Erhvervsaktiviteter i øvrigt**	**Mulige aktiviteter**
Ramsarområder	Ramsarområderne er pt. medtaget under "Vigtige områder for dyrelivet" se denne kategori	Ingen aktivitet tilladt	Råstofaktiviteter
Verdensarvs-områder	Ingen aktivitet tilladt	Mindre fangst/fiskeri	Fangst og fiskeri
Fortidsminder	Ingen aktivitet tilladt i 20 meters afstand	Ingen aktivitet tilladt i 20 meters afstand	Ingen
Biosfæreområder	Kun aktivitet i bufferzoner, hvis det ikke er i modstrid med beskyttelsesformålet	Mulighed for bløde erhverv i bufferzonerne	Råstofaktiviteter, bløde erhverv
Naturfredede/-beskyttede områder	Lovgivning => aktiviteter tilladt kategoriseringer => aktiviteter kun mulige i laveste beskyttelseskategorier. Særlige regler for nationalparken	Mulighed for bløde erhverv i nogle zoner. Kræver naturkonsekvensvurdering	Råstofaktiviteter, bløde erhverv
Havområder	Generelle restriktioner vedr. oliespild, affald og dumpning indtil 3 sømil fra den grønlandske kyst. Efter 3 sømil gælder Råstofloven, dvs. HSE-krav	Generelle restriktioner vedr. oliespild, affald og dumpning indtil 3 sømil fra den grønlandske kyst.	Alle
Råstofområdets: Vigtige områder for dyrelivet	Særlige krav om hensyntagen til dyreliv	I områder der ikke henhører under andre kategorier er al øvrig erhvervsaktivitet tilladt	Alle
Ferskvandsressourcer	Ingen aktivitet tilladt indenfor udlagte spærrezoner	Ingen aktivitet tilladt indenfor udlagte spærrezoner	Ingen
Alle	Generelle restriktioner vedr. affaldshåndtering mv. CO2 minimering + VVM + baselinestudy + miljøbeskyttelsesplan + beredskabsplan	Generelle restriktioner vedr. affaldshåndtering mv. CO2 minimering (Kyoto) + VVM for større anlæg og projekter i henhold til Espookonventionen	

I områder der ikke er fredet enten i henhold til national lovgivning eller internationale aftaler ser det således ud til at alt (undtagen de anlæg der er nævnt i Espookonventionen) kan foregå når blot et selskab indhenter en arealtildeling – og hvis det er udenfor et område omfattet af en frilandsplan er der ikke særlige restriktioner

forbundet med arealtildelinger. Alligevel er der risiko for at netop et manglende plangrundlag benyttes som årsag til at afvise et projekt. Således er det ikke entydigt hvad der kan opnås tilladelse til i det åbne land.

I områder der er fredet i henhold til den nationale lovgivning er der også mulighed for forvirring, for de retningslinjer, der anvendes til at kategorisere områder (IUCN) tillader ikke råstofaktiviteter – men godt visse blødere former for erhverv. I lovgivningen gives der dog mulighed for råstofaktiviteter. Det vil sige at Grønland faktisk ikke kan bruge IUCN's kategorisering nu. Det betyder igen (groft sagt) at man i princippet kan tillade anden aktivitet indenfor fredede områder også uden at det vil ændre på det faktum at Grønland fortsat kan kalde dem fredede men ikke må bruge IUCN's kategoriseringer. Dog har vi erklæret i henhold til en anden konvention at vi vil frede vores fredede områder i henhold til IUCN. Lige nu er der krav til at råstofprojekter indenfor disse fredede områder skal udarbejde miljøvurderinger. – Hvis der gives tilladelse til erhvervsprojekter bør dette også gælde dem generelt – efter en eller anden form for definition.

Råstofdirektoratet har udarbejdet særlige retningslinjer for råstofaktiviteter og kortbilag med angivelse af hvilke områder der er åbne for aktiviteter. Råstofdirektoratet stiller i forbindelse med efterforskningstilladelser krav om udarbejdelse af miljøvurderinger af typen VVM, på baggrund af baseline studier i 2-3 år. Råstofdirektoratet er på denne måde velforberedt på henvendelser fra selskaber. På baggrund af tidens politiske fokus på, at arbejde for at skabe vækst og erhvervsudvikling ved dels at udvikle råstofsektoren til et bærende erhverv og dels, at fokusere på etablering af store energiintensive industrier synes det vigtigt, at Direktoratet for Miljø og Natur (Departementet for Infrastruktur og Miljø) tilsvarende Råstofdirektoratet udarbejder retningslinjer for krav til selskaber der er interesserede i at starte storskala erhvervsprojekter som kan have væsentlig effekt på miljøet. Dette vil dels gøre det mere overskueligt for selskaber at forholde sig til lovgivningen inden en eventuel henvendelse, desuden vil det gøre det nemmere for direktoratet at vejlede selskaberne og dels gøre det nemmere at administrere projekterne.

Storskala erhvervsprojekter kan generelt ligestilles med råstofaktiviteter mht. krav om udarbejdelse af miljøvurdering samt krav om beredskabsplan i tilfælde af miljøuheld. Der kan med fordel trækkes på erfaringer fra Råstofområdet i forbindelse med udarbejdelse af procedurer mv. der kan indenfor lovgivningen differentieres imellem forskellige typer af projekter og det anbefales at definitionerne af erhvervsprojekter kommer på plads, så det bliver tydeligt for virksomheder hvilke krav og forventningerne der stilles på miljøområdet i forbindelse med etablering.

Departementet for Infrastruktur og Miljø planlægger at præsentere en VVM bekendtgørelse med ikrafttræden i 2009. Således vil Hjemmestyret opfylde den del af Espookonventionen, som omhandler miljøvurdering af projekter og det kan i denne forbindelse overvejes om forbeholdet for Grønland vedr. SEA protokollen skal ophæves. Der kan blandt stilles krav om udarbejdelse af strategisk miljøvurdering af planer og programmer, der skønnes at kunne få væsentlig indflydelse på miljøet, således at dette kan bidrage til et udgangspunkt for en overordnet strategisk politisk plan for udnyttelse i fremtiden. Planer om 5 miner og aluminiumsindustri må vurderes at høre under denne kategori.

Anbefalinger:

- Generel vejledning til erhverv om miljø- og naturregulering
- Beredskabsplan for miljøuheld for alle projekter
- Definition/kategorier af erhvervsvirksomheder (f.eks. kategorier af størrelse, miljøpåvirkningsgrad)

- Beskrivelse og vedtagelse af hvad der må foregå hvor, herunder gældende regler for fredede områder og evt. andre "vigtige områder".
- Indførelse af VVM og SMV i forbindelse med krav til storskala erhvervsprojekter

7. Liste over forkortelser

EIA: Environmental Impact Assessment = VVM.
HSE: Health, Safety and Environment.
IUCN: The World Conservation Union.
MAB: Man and Biosphere programme under UNESCO.
MST: Miljøstyrelsen.
OSPAR: Konventionen om beskyttelse af det marine miljø i Nordøstatlanten.
PLONOR Pose little or nor risk to the environment. OSPAR"s liste over miljøvenlige stoffer der kan udledes til det marine miljø
UNESCO United Nations Educational, Scientific and Cultural Organization.

8. Liste over anvendte kilder

Landstingsforordning nr. 12 af 22. december 1988 om beskyttelse af miljøet
http://www.nanoq.gl/gh.gl-love/dk/1988/ltf/ltf_nr_12-1988_dk/ltf_nr_12-1988_dk.htm

Landstingsforordning nr. 7 af 13. maj 1993 om ændring af Landstingsforordning om beskyttelse af miljøet
http://www.nanoq.gl/gh.gl-love/dk/1993/ltf/ltf_nr_07-1993_dk.htm

Landstingsforordning nr. 14. af 31. oktober 1996 om ændring af Landstingsforordning om beskyttelse af miljøet
http://www.nanoq.gl/gh.gl-love/dk/1996/Ltf/ltf_nr_14-1996_dk.htm

Landstingsforordning nr. 1 af 21. maj 2004 om ændring af Landstingsforordning om beskyttelse af miljøet
http://www.nanoq.gl/gh.gl-love/dk/2004/ltf/ltf_nr_01-2004_miljø/ltf_nr_01-2004_dk.htm

Landstingsforordning nr. 8 af 15. november 2007 om ændring af Landstingsforordning om beskyttelse af miljøet
http://www.nanoq.gl/gh.gl-love/dk/2007/ltf/ltf_nr_08-2007_miljoebeskyttelse/ltf_nr_08-2007_dk.htm

Anordning nr. 1012 af 14. december 1994 om ikrafttræden for Grønland af lov om beskyttelse af havmiljøet.

Landstingsforordning nr. 4 af 3. november 1994 om beskyttelse af havmiljøet.
http://www.nanoq.gl/gh.gl-love/dk/1994/Ltf/ltf_nr_04-1994_dk.htm

Landstingsforordning nr. 3 af 6. juni 1997 om ændring af Landstingsforordning om beskyttelse af havmiljøet
http://www.nanoq.gl/gh.gl-love/dk/1997/ltf/ltf%20nr%2003-1997%20dk.htm

Landstingsforordning nr. 2 af 21. maj 2004 om ændring af Landstingsforordning om beskyttelse af havmiljøet
http://www.nanoq.gl/gh.gl-love/dk/2004/ltf/ltf_nr_02-2004_havmiljøet/ltf_nr_02-2004_dk.htm

Råstofloven:
http://www.nanoq.gl/Groenlands_Landsstyre/Raastofdirektoratet/Organisation/Lovgivning/Raastofloven.aspx

Naturbeskyttelsesloven:
http://www.nanoq.gl/gh.gl-love/dk/2004/bkg/bkg_nr_01-2004_dk.htm

Råstofaktiviteter og natur- og miljøhensyn i Grønland: Faglig rapport fra DMU, nr. 524, 2005

Minedrift og miljø i Grønland: Temarapport fra DMU 38/2001

Standardvilkår for efterforskningstilladelser og udnyttelsestilladelser:
www.bmp.gl

Feltregler for minedrift i Grønland:
www.bmp.gl

UNECE protokollen om strategisk miljøvurdering:
KOM(2003) 221

Foreløbig SMV for Nuussuaq halvøen:
http://www.dmu.dk/Udgivelser/Faglige+rapporter/Nr-650-699/Abstracts/FR652_sammenfatning_DK.htm?wbc_purpose=bas%25

SMV direktivet:
EU-direktiv om vurdering af bestemte planers og programmers indvirkning på miljøet (SMV-direktivet), 2001/42/EF

VVM- direktivet:
EU-direktiv om vurdering af visse offentlige og private projekters indvirkning på miljøet, 85/337/EØF og 97/11/EF

Miljøforordningen:
Lov nr. 850 af 21. december 1988 for Grønland om miljøforhold m.v.

Protocol on Strategic Environmental Assessment:
SEA-protokollen af 21. maj 2003, Kiev, Ukraine.
http://www.folketinget.dk/Samling/20021/udvbilag/MPU/Almdel_bilag914.htm

Espookonventionen:
Bekendtgørelse af konvention af 25. februar 1991 om vurdering af virkningerne på miljøet på tværs af landegrænser (nr. 71 af 4. november 1999):

Fortidsmindeloven:
Landstingslov nr. 5 af 16. oktober 1980 om fredning af jordfaste fortidsminder og bygninger

Råstofdirektoratets EIA vejledning: BMP guidelines – for preparing an Environmental Impact Assessment www.bmp.gl

Greening the

Environmental values and impact assessment

INTRO:
Greenland is facing a heavy industrial development including new mines, petrol exploration and aluminium production. Still impact assessments are at an early stage as Greenland is just presently implementing IA into the national environmental protection legislation. Resent research has shown that there is a present need to implement a broad concept of environment into the national environmental protection law, based on the Greenlandic context (Hansen & Kørnøv, 2009). This paper investigates public values in relation to the industrial development. Based on portraits of 13 Greenlanders a comparative analysis is carried out pointing at the differences between public values, concept of environment practised today, concept of environment in the policy/law and the ideal concept seen from the perspective of professionals. It is shown that to obtain value rationality in the environmental protection, IA's should include education settlement pattern and the access to natural resources.

Method and theory:

To investigate the values seen from a local and public Greenlandic perspective, and thereby to provide input to the ongoing dialogue on environmental protection and development in Greenland, this paper present a study of a group of individual Greenlanders' perceptions of societal values in relation to development. The study is based on a total number of 13 personal value portraits conducted on the basis of conversations with people of different age and gender. All conversations were conducted in the participants 'own spheres, at home or at work, and all but one was conducted in the respondents native language. Seven of the conversations were recorded and four was written in note form immediately after the conversation. The results from the interviews are compared with results from an analysis of the gaps between legislation, needs and wants from the professionals and practice.

Value-concept and -investigation:

The concept of "value" comes originally from the Latin expression Valere, which means to have power. The value concept is a basic concept in social science and philosophy and is linked to the perception of what is good. It can relate to the individual's perception of material goods, where one thing can have a greater value than another, but it can also relate to groups perceptions of what is 'the good society'. And it is in this latter meaning the value portraits are carried out. Bent Flyvbjerg characterises as 'phronetic research' concerning values and which "…goes beyond analytical, scientific knowledge (episteme) and technical knowledge or know how (techne) and it involves what Vickers (1995) calls "the art of judgement" (Flyvbjerg, 2004: 284). This kind of planning research takes a point of departure in four value-rational questions (Flyvbjerg, 2004: 290): "(1) Where are we going with planning, (2) Who gains and who loses, and by which mechanisms of power, (3) Is this development desirable? And (4) What, if anything, should we do about it?" and should be seen as a basis for practice and action. The emphasis is the problem-based approach, contextualism, collaboration, and closeness to reality and what is being studied with the aim of 'making social science matters' (Flyvbjerg; 2004). This poster investigates social values in relation to planning based on the Flyvbjerg approach and the interviews/conversations are grounded in the four value rational questions, which all were asked to the respondent's during the interviews. An important argument for choosing this approach is that there is no definitive, objective answers to the questions and answers therefore relate to the personal value perceptions. When the value perceptions are common to people, they are regarded as social values.
The content of the conversations is used to identify the common issues raised in general by more participants and the statements regarding these issues are analyzed in relation to age and gender.

Key figures about Greenland per January 2008

Location: The world's largest non-continental island on the northern American continentbetween the Arctic Ocean and the North Atlantic Ocean, northeast of Canada.

Area: 2,166,086 km^2

Ice-free area: 410,449 km^2

Coastline: 44,087 km

Highest point: Gunnbjørns Fjeld 3,693 m

Terrain: Flat to gradually sloping icecap covers all but a narrow, mountainous, barren, rocky coast. The ice cap is up to 3 km thick.

Climate: Arctic to subarctic; cool winters and cold summers in which the meantemperature does not exceed 10°

Meantemperature, January: Qaqortoq -6.0°, Nuuk -8.6°, Kangerlussuaq -19.3°, Ilulissat -12.6°

Meantemperature, July: Qaqortoq: 9.2°, Nuuk 7.7°, Kangerlussuaq 11.5°, Ilulissat 9.6°

Population: 56,194

Density: 0.14 pr. km^2 ice free area

Population growth rate: -0.44 pct.

Ethnic groups: Inuit 89 percent, Danish and others 11 percent

Religions: Evangelical Lutheran

Government type: Parliamentary democracy within a constitutional monarchy

GDP: 10,542 mio. DKK. (2006)

Industries: Fish processing, handicrafts, hides and skins, small shipyards, mining

Poster by: Ph.d. Fellow, Anne Merrild Hansen
DCEA, The Danish Center for Impact Assessment
Aalborg University, Department of Development and Planning

References:
Merrild, Anne; Vium, Christian (2009) *Value portraits in a time of industrial development and climate change*. Tidsskriftet Grønland no. 4 2009, p. 2-15.
Flyvbjerg, B (2004). Phronetic Planning Research: Theoretical and Methodological Reflections. In *Planning Theory & Practice*, **5**(3), 283-306. Routledge.
Merrild and Kørnøv (2009) *A value-rational view upon Impact Assessment of mega industry in a Greenlandic planning and policy context* accepted for IAPA, June 2010
Photos by to the right by Christian Vium: Photographer and PhD fellow at Copenhagen University: christian.vium@anthro.ku.dk

Industrial Sector

in a Greenlandic industrial development context

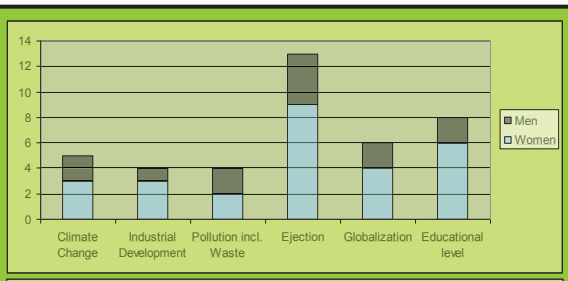
Values and issues:
The 13 portraits points to several general issues and values. As also shown in the two examples on presented on this poster, the persons bring up personal areas of concern in relation to the changes they experience in their daily lives. There are recurring themes in the portraits. The topics focused on are:

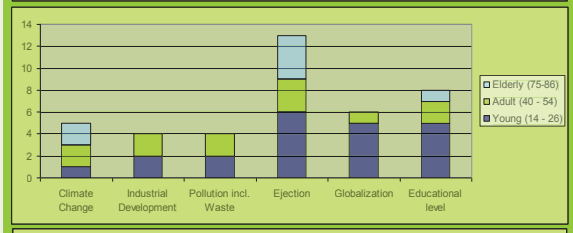
- the weather and the climate is changing
- industry is growing and changing character
- pollution and human-induced degradation of nature
- centralization - people moving from smaller to larger urban centers or abroad increased globalization and
- educational opportunities, and level

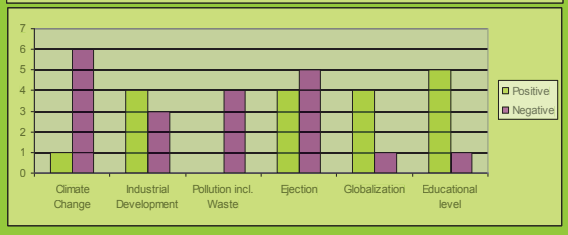
There is broad agreement among participants that these very different types of changes are impacting significant on their lives right now. Meanwhile, the participants are affected by a certain ambivalence, since none of the changes are seen as unambiguously negative or positive. This way industrial development is both seen as a way to obtain desired jobs and improve the economy of Greenland, and thus contribute to a better society for all, while industrial development at the same time is seen as a threat to nature, environment and to Greenlanders cultural values. It is striking that every problem mentioned by several participants. The graphs on the left shows the number of people who have described the different topics in the interviews. It appears that there is a particular issue that affects everyone, because it is included in all the portraits, namely a tendency to move people from small urban communities into the larger cities or abroad.

There is a general age spread on the topics, as shown in the graph on the right. While adults and older people primarily consider emigration and centralization problematic, the young people have a different perspective because they see the possibility to move from a small community to a larger, as an opportunity and an individual freedom to achieve better living conditions through education or job opportunities. The portrayed young people find the most important challenge to cope with globalization and to get education. For example, all the young people mention, that language skills are a prerequisite to educate them selves both in Greenland and especially abroad. They do not feel that their language skills from school are adequate to implement a secondary or higher education. When they simultaneously sees education as a prerequisite for getting 'the good job' and 'live the good life' in the future Greenland, it places them in a situation where language skills are a necessity. Thus, it is also striking that all portrayed either in the process of language courses or have aspirations to go to college or stay at school in Denmark.

(Merrild and Vium, 2009)







Name: Lone Kristiansen
Age: 75 years

Where are we going?
I do a lot of needlework, and I have made numerous national costumes. Once I made a dress just in beads. I did it because I would like to see if it was possible to do it. It became very beautiful. I have made national costumes for my daughters and grandchildren. I have also made an income from selling my creations. I can show you some embroidery and knitted wrist warmers I have done.

I like it when it is sunny weather. Weather has changed since I was a child. It is warmer now compared to then. The temperature is rising. I like to look at the sea from the window in my room. It is very pretty. From the window I can see the variations in the weather. When I was a child is was colder and there were more fish in the sea.

Everything has changed in Greenland in recent years. Many people in my family have died and Greenland has changed.

Is it desirable?
I think it was nicer when the weather was colder. Because that is the way it was back when I was a child. The climatic changes do not bother me much, but it is not good for fishermen and hunters, as the fish are disappearing.

What should be done?
It should be recognized, that people are not the same and have different values in life and they should have opportunity to live the way they appreciate.

Who wins and who looses
The hunters and fishermen looses and those who collect berries and lives from the resources of nature. If people get educated, and get good jobs, they win.

Name: Alibak Zeeb
Age: 16 years

Where are we going?
Greenland is developing all the time. We need to upgrade to be a part of the global society.
I heard about climate changes on the television. I noticed my self that it is getting warmer here. There is less ice now than there were earlier. It used to feel more freezing at this time of the year.

Is it desirable?
Next year I will be moving to Sisimiut to take an education. It is good to be able to educate and get a job.

Friends and family is very important to me. I think it is to most young people. I have a tattoo on my neck. It is a mark that I shear with some friends of mine. Some of them are my cousins. The symbol is a cross. I think that it is hard to be separated from my friends when we have to move to different cities to go to school, but I am looking forward to go to Sisimiut.

What should be done?
There are a lot of problems in Greenland. People are committing suicide. I think it should be dealt with.

Who wins and who looses
I don't know really, - is it is good or bad? It does not affect me and I don't really care.

Challenges to Impact Assessment of industrial projects in order to 'green' the industrial sector in Greenland:

	Policies	Professionals	Practice	Public
Values for IA performance	Protecting the Environment	Balancing development and environmental protection	Mitigation and securing industrial permission	Securing human well being with focus on social values
Concept of Environment	Two different concepts. Primarily narrow	Broad concept of Environment	Variations but in general broader than the law prescribes	Broad, including settlement pattern, mobility, education, climate change, labour

Needs according to: IA legislation, IA professionals, IA practice and 13 inhabitants in Qeqertarsuaq, Greenland.
Results from (Merrild and Kørnøv; 2009) combined with results from (Merrild and Vium; 2009)

Change agents & Impact Assessment

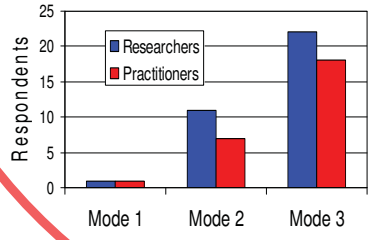
Change agents to close the gab between impact assessment science and practice

One of the challenges facing impact assessment is finding ways to work in research and practice that allow appropriate action and critical interrogation of action to enable and support sustainable change.

Change agent is seen as a way to close the experienced gab between science of IA and practice of IA. It is closely linked to current societal needs and undertaken in cooperation between science and practice. It is in this investigation understood as a combination of Mode 3 research defined by Kurek et al. (2007) and a normative framework as described by Jamison (2001).

To make green knowledge through SEA, and impact decision making, science and practice needs to be connected.

Survey at IAIA Geneva conference



A simple survey of modes of knowledge production at IAIA Geneva conference indicated a widespread self-image among practitioners and researchers of engaging in mode 3 knowledge production

Change agent as a mode of knowledge production

Mode 1: Classic research

Knowledge is produced solely by researcher

Goals and methods of knowledge production are defined solely by researchers

Knowledge production is independent of practice in terms of economy and information

Mode 2: Entrepreneurship

Knowledge is produced mainly by researchers

Goals and methods of knowledge production are defined mainly by practice

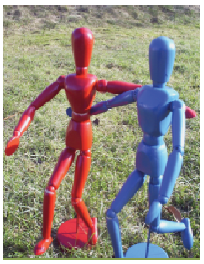
Knowledge production is dependent in terms of economy and information – between researchers and practice

Mode 3: Change Agents

Knowledge is produced in cooperation between researchers and practice

Goals and methods of knowledge production are ongoing negotiation between researchers and practice

Knowledge production is an interdependent relation between researchers and practice



Investigating change agent potentials and roles

Cases	Potentials for research and practice		Role of researcher
Case 1 concerns the first generation of SEA in relation to the national energy infrastructure in Denmark (gas and electricity).	**Access to people, processes and information** by participation gives possibilities for testing hypothesis	*"The strength is that SEA **theory is challenged by reality's diversity** of asymmetrical courses and sudden political and strategic changes."* (Head of Section, Energinet.dk)	**Helping out**: The researcher is a 'critical friend' trying to change the system from the inside
Case 2 concerns SEA of mega industry in Greenland in a system with no legislation or guidelines in place.	**Ownership of outputs of autonomous research** where the organisation may work as a platform for disseminating research results to society and other practitioners.	*"[It] have had **great impact for progress and development of the specific SEA**, that Anne has 'wafted over the water' in different matters" (Head of Department, The Greenlandic Self Rule)*	**Taking side:** The researcher develops a kind of partisanship with the society against impacts of industry
Case 3 concerns the Danish process of preparing river basin management plans and SEAs of these (implementing the EU Water Framework Directive)	**Dialogue on direction of research** and continuous "reality-check" of the research in the interaction with practitioners	*"Sanne gets input for understanding everyday life and problems of the practitioners. Thereby the research study adjusts to a more societal beneficial approach." (Head of Department, Rambøll)*	**Giving advice:** The researcher keeps an academic distance in advising the organisation with professional input

The three investigated cases are cooperations between Aalborg University and external organisations, which are characterised by interdependence on economy, information exchange and engagement. At the same time, the setup of the cooperation gives the researcher organisational autonomy.

The investigation of the three cases also identifies risk and weaknesses of the approach: The external organisation needs backing from the entire organisation to fully benefit from the research; contextual changes such as change of organisational tasks may hinder the impact of the research

The investigation also shows that Mode 3 research is not dissociated from Mode 1 and Mode 2 research. Rather the experience is that a choice of mode suited for the specific phase of research makes it possible to utilise the advantages of each mode.

References:
Kurek, Kasia, Peter A T M Geurts and Hans E Roosendaal. 2007. The research entrepreneur: strategic positioning of the researcher in his societal environment. *Science and Public Policy*. 34(7). 501-513. Beech Tree Publishing.
Jamison, Andrew. 2001. *The Making of Green Knowledge*. Cambridge University Press.

DCEA | THE DANISH CENTRE FOR ENVIRONMENTAL ASSESSMENT

The investigation and poster is made by
Professor PhD Lone Kørnøv
PhD fellow Sanne Vammen Larsen
PhD fellow Anne Merrild Hansen
PhD fellow Ivar Lyhne

10 Portraits of Greenlanders

10 portraits were conducted with Greenlanders in the Disko area. They were based on four open questions:

Where are we going?
Is it desirable?
What should be done?
Who wins and who looses

The interviews points to several general issues and values. As also shown in the two examples on presented on this poster, the persons bring up personal areas of concern in relation to the changes they experience in their daily lives. There are recurring themes in the portraits. The topics focused on are:

- the weather and the climate is changing
- industry is growing and changing character
- pollution and human-induced degradation of nature
- centralization - people moving from smaller to larger urban centers or abroad increased globalization and
- educational opportunities, and level

There is broad agreement among participants that these very different types of changes are impacting significant on their lives right now. Meanwhile, the participants are affected by a certain ambivalence, since none of the changes are seen as unambiguously negative or positive. This way industrial development is both seen as a way to obtain desired jobs and improve the economy of Greenland, and thus contribute to a better society for all, while industrial development at the same time is seen as a threat to nature, environment and to Greenlanders cultural values. It is striking that every problem mentioned by several participants. The graphs on the left shows the number of people who have described the different topics in the interviews. It appears that there is a particular issue that affects everyone, because it is included in all the portraits, namely a tendency to move people from small urban communities into the larger cities or abroad.

There is a general age spread on the topics, as shown in the graph on the right. While adults and older people primarily consider emigration and centralization problematic, the young people have a different perspective because they see the possibility to move from a small community to a larger, as an opportunity and an individual freedom to achieve better living conditions through education or job opportunities. The portrayed young people find the most important challenge to cope with globalization and to get education. For example, all the young people mention, that language skills are a prerequisite to educate them selves both in Greenland and especially abroad. They do not feel that their language skills from school are adequate to implement a secondary or higher education. When they simultaneously sees education as a prerequisite for getting ‘the good job’ and ‘live the good life’ in the future Greenland, it places them in a situation where language skills are a necessity. Thus, it is also striking that all portrayed either is in the process of language courses or have aspirations to go to college or stay at school in Denmark.

Name: Adam Møller
Age: 82 years
Town of birth: Qeqertarsuaq
Present residence: Qeqertarsuaq nursinghome
Profession: Retired

Where are we going?

A lot of young people are moving away from Qeqertarsuaq now. They are gathering in the bigger towns or moving to Denmark and don't come back.

When I was younger I worked for a local contractor. I also worked with radio mechanics. I have only gone to public school in Qeqertarsuaq, but I was later trained in radio mechanics in Denmark. It was near Rebild in 1966. My sister has a Danish husband and they live in Denmark. My two children also moved to Denmark. I visited them all a few years ago. I don't speak Danish. But I did once. I some times feel a little lonely. But I listen to music and watch movies. I like action movies; Jean Claude Van Damme is one of my favourite actors.

I have a great view from my room. There used to be snow on the mountains in Qeqertarsuaq at this time of year. The snow comes later. It does not come until it gets cold at the top of the hill and it will not be until it gets colder in the air. There is not much ice in the fjord because there has been a storm recently.

Is it desirable?

I do not really think about why the weather is being different. That is just the way it is. I think it is okay that people leave to follow their opportunities.

What should be done?

Maybe there should be more jobs and more to do for the young people in Greenland, so it was more attractive to stay here.

Who wins and who looses

I think the future in Greenland is good for the educated people, but those who can not get jobs here, they are moving away.

Name: Alibak Zeeb
Age: 16 years
Town of birth: Qeqertarsuaq
Present residence: Qeqertarsuaq
Profession: student at Piareersarfik

Where are we going?

Greenland is developing all the time. We need to upgrade to be a part of the global society.

I heard about climate changes on the television. I noticed my self that it is getting warmer here. There is less ice now than there were earlier. It used to feel more freezing at this time of the year.

Is it desirable?

Next year I will be moving to Sisimiut to take an education. It is good to be able to educate and get a job.

Friends and family is very important to me. I think it is to most young people. I have a tattoo on my neck. It is a mark that I shear with some friends of mine. Some of them are my cousins. The symbol is a cross. I think that it is hard to be separated from my friends when we have to move to different cities to go to school, but I am looking forward to go to Sisimiut.

What should be done?

There are a lot of problems in Greenland. People are committing suicide. I think it should be dealt with.

Who wins and who looses

I don't know really, - is it is good or bad? It does not affect me and I don't really care.

Name: Augusta Salling
Age: 55 years
Town of birth: Narsaq
Present residence: Qeqertarsuaq
Profession: Owner and director in private tourism company.

Where are we going?
Greenland is not a developing country seen from the perspective of well being. We have a high living standard. Our fishing fleet and production system is very developed. You hear a lot about abuse of children in Greenland, but I think that we are capable of solving of our own social problems. Seen from the perspective of the industrial potentials, Greenland is not yet developed. Development of mines and oilfields in Greenland could be beneficial to both Greenland and the rest of the world. Therefore Greenland needs CO_2 quotas to be able to develop.

Fifty years from now we will have a lot of better educated young people than today. The education level in the country will be significantly higher than now.

It is likely that we will live more concentrated in fewer areas and towns. Not as spread as today. But we should look out and not concentrate the population of Greenland to much to be able to have access to the resources in all the areas. We are so few that we could easily live in one place. But it would be really boring.

Is it desirable?
You can fear that if we implement all the planned mining and oil and aluminium projects, we will need a lot of people from other countries to move here and work here. Our local population will be mixed with a lot of different nationalities, so it is hard to imagine how we will be then.

What should be done?
I would like development to happen. I think that development is good and needed to make Greenland more economically independent. But we should think about how many and which project should be implemented. The changes to society should not happen to fast. It is important that the population is able to adapt. If development happens to fast people will not be able to adapt. Greenlanders are generally good at adapting but we have seen examples, where development happened to fast. Like when people was forced to move from the mining area of Qullissat and people still now 40 years later can break down and cry, when they talk about what happened back then. We should learn from this in the future.

We should take care on the environment and everybody should take responsibility of their own actions from the little piece of crap thrown in nature to the larger environmental issues in relation to industrial development.

I think that it is important that people becomes aware of where they can seek information about the impacts of different industrial projects.

Who wins and who looses

If we are ready and open to changes, if we learn our children and grandchildren, that the world does not stand still and develops at all times and that we should be open to learn and adapt. Then we can all become winners.

Name: Elisabeth Broberg
Age: 82 years
Town of birth: Qeqertarsuaq
Present residence: Qeqertarsuaq nursing home
Profession: Retired

Where are we going?

The weather has become drier in recent years.

I worked as a maiden for a Danish family in my hometown, Qeqertarsuaq until I got married. It was as a maiden I learned a little Danish. My husband was responsible for the village supply, and worked as a leader here in the city for many years. Together we have 6 children, three daughters and three sons. One of my daughters is dead. My husband is also dead. It was just a few years ago.

When I was a child living in Qeqertarsuaq, there were not many inhabitants. Now the number has increased significant. But the young people tend to move away from the city now. Many move to Ilulissat, Nuuk or Denmark. One of my sons, Thomas has moved to Odense.

Is it desirable?

The climate changes impacts on the berry season. The berries are smaller and disappear quicker than before in this area. It is not good. It is sad for the nature that it is getting warmer, but I like sitting out in the sun.

A lot of things have been changing since I was a child. The number of inhabitants in the city changed. First it increased and now it is decreasing. Who knows what it is like 50 years from now!?

What should be done?

Everything is good for something and bad for something else. I think it is good for the young people that they have opportunities, but it would be better if they could decide themselves weather or not they would like to stay here or move away.

Who wins and who looses

It is hard to say. I guess we all adapt to changes and find our way.

Name: Evannguaq Sandgreen
Age: 26 years
Town of birth: Qeqertarsuaq
Present residence: Qeqertarsuaq
Profession: Student at Piareersarfik

Where are we going?

Nature means a lot to me. My man is a hunter and when he takes me out in his boat, it makes me happy. I love fishing and hunting. Going out into the nature, we feel how the weather is changing with warmer summers and more storms these years. Today the weather is very good. It would be nice to go sailing and fishing, but I just started at Piareersarfik (preparation school) this Monday, so I can not skip out.

Inuit nalerqusartuaangarpugut

Greenland is changing these years. A lot more will change in the next fifty years. Technology is developing and there is more pollution. I think that humans influence on nature by the way we act, by polluting. When people cause emissions and throw out waste, we impact on the natural balances.

Is it desirable?

"Asuki": I don't know. It is a problem that the ice I disappearing and the weather is getting warmer. We can not relay on our knowledge about nature and natural species. We also need more jobs. The lack of jobs in the smaller towns causes a situation where some have to move away even though they do not want to.

What should be done?

We should have the ice back (laughing). There should be more jobs here, and more education and institutions. I would like to become a clothing designer, but I have no chance to educate as one here.

We should also be better to protect the environment: the world (nuna) and the climate/weather (silarlu).

Who wins and who looses

The most important thing for me is our planet, our natural environment. If we lose access to nature, we lose everything. As a human being I find the surroundings essential for well being.

Name: Jørgen Olsen (Ngaanga)
Age: 42 years
Town of birth: Qeqertarsuaq
Present residence: Qeqertarsuaq
Profession: Fisherman

Where are we going?

The ice is melting quick now because of global co2 emmissions. It is bad. The human races influences on the climate. I have become more aware of the interaction between humans and environment. I think about waste and I don't through waste in the nature any longer.

I am sure that the future will bring petrolproduction, mining and aluminiumproduction to Greenland. It is good for Greenland. Today most jobs are in relation to fisheries, but suddenly species disappears and it makes the jobs unstable. Greenland needs development. The jobs in the mining sector and petrol- and aluminium production will mean new and more stabile jobs in Greenland.

More Greenlanders are getting higher education now than earlier. We are getting smarter and trying to keep up with the global society.

Is it desirable?

The future for Greenland brings new industries. Greenlanders are good ad adaptation to new strategies. I think that industrial development with aluminiumproduction, mines and petrolexploration is good for Greenland as it creates more stabile jobs.

Also the climate changes bring new opportunities, even though there are more and stronger storms. The summers become warmer and warmer. The sea is also warmer and there are more catfish than earlier years.

What should be done?

Greenland should have a new and better infrastructure, so that people get access to jobs in other towns. Still there are way too many settlements that are too expensive to run. Sometimes there are only 30-40 people living in the villages. It is not worthwhile keeping them running – it is too expensive for the Greenlandic society as a whole.

I think that humans need to be more aware of the influence of their actions – it impacts on nature.

Who wins and who looses

All Greenlanders wins from national industrial development. It brings new possibilities and we are capable of adapting. We are able of trying it out and make the best of it. We like challenge: it is a kind of motto for Inuits, because they are used to be living in the nature.

Name: Lone Kristiansen (Luuna)
Age: 75 years
Town of birth: Qeqertarsuaq
Present residence: Qeqertarsuaq nursing home
Profession: Retired

Where are we going?

I do a lot of needlework, and I have made numerous national costumes. Once I made a dress just in beads. I did it because I would like to see if it was possible to do it. It became very beautiful. I have made national costumes for my daughters and grandchildren. I have also made an income from selling my creations. I can show you some embroidery and knitted wrist warmers I have done.

I like it when it is sunny weather. Weather has changed since I was a child. It is warmer now compared to then. The temperature is rising. I like to look at the sea from the window in my room. It is very pretty. From the window I can see the variations in the weather. When I was a child is was colder and there were more fish in the sea.

Everything has changed in Greenland in recent years. Many people in my family have died and Greenland has changed.

Is it desirable?

I think it was nicer when the weather was colder. Because that is the way it was back when I was a child. The climatic changes do not bother me much, but it is not good for fishermen and hunters, as the fish are disappearing.

What should be done?

It should be recognized, that people are not the same and have different values in life and they should have opportunity to live the way they appreciate.

Who wins and who looses

The hunters and fishermen looses and those who collect berries and lives from the resources of nature. If people get educated, and get good jobs, they win.

Name: Margrethe Broberg
Age: 86 years (the oldest person in the town)
Town of birth: Skansen
Present residence: Qeqertarsuaq nursing home
Profession: Retired

Where are we going?

I am the oldest woman in this town. I was not born here. I was born in Skansen, but my family moved to Qeqertarsuaq when I was a child. My sister died just before we moved. When I was a child, the family bonds in Greenland were very strong. I have lived here since and I think it is a good place to be.

Things change. Today the land does not make a sound when you walk on it. It did when I was younger. The reason why it does not squeak any longer is because the weather is not so cold anymore.

Is it desirable?

I do not really like changes. When things change you don't know what to expect.
I think it is sad that the land no longer squeaks when you walk on it.

What should be done?

Nature can not be controlled by man, but we influence and should be aware of our actions.

Who wins and who looses

In the development the strong wins and the weak looses, that is the way it works.

Name: Nuka Pavia Wille
Age: 50 years
Town of birth: Kangerluk (settlement on Disko Island)
Present residence: Kangerluk
Profession: Handicraft worker

Where are we going?

The weather is something we talk a lot about in the settlement. It is very important in every day life; among others it affects transportation between Qeqertarsuaq (the nearest town) and Kangerluk. If the weather is bad, it is not possible to sail, and if it is hot the ice will not be good to dogsledge on. The ice cap is retreating dramatically in this area. The glaciers are redrawing as well. Five years ago the glaciers would go all the way down and into the fjord, but now they are very small. It is because of the changes of the icecap, that the weather becomes warmer. My grandparents and my father told me, that they used to go to Ilulissat (across the fjord) on dogsledge in the winters when my father was a child. The ice was over 1 m thick back then. It is completely impossible now as the ice does not get thicker than 26cm. Around the year 1900 there were reindeers in our village, Kangerluk. There is not any longer. There must have been many reindeers because I found a lot of old bones.

I live with my wife here in Kangerluk. I was born here. My parents and grand parents were also born here. I have four children. Only one stayed here in Kangerluk the others moved away to get jobs in the bigger cities. My youngest is 15 years old, it is a son. He is studying in Norway. I am very proud of him. No doubt that I miss him, but it is good for him to be in Norway. I do not have the money to visit him or buy him a ticket here.

Is it desirable?

In Greenland we are aware that nature changes all the time. In the old days Inuit people were nomads and would travel from place to place depended on the shifts in the weather. It is also told in old stories how Inuit have always known that man and nature impacts on each other. It can be problematic when things change, but you adapt to the changes. You never know when it changes again. It is not something you desire, but it is not something you try to change neither.

People are moving away from the settlement. They love this place, but there are no longer fish enough to catch. Back in the fifties there were 100 inhabitants. Now there are only 34. They live in 14 houses. The rest of houses are empty. I find it sad.

What should be done?

It is hard to say what should be done. You can not say exactly why the weather is changing. The nature is very complex. When will the fish return and new jobs be created?

I went to Denmark on a course to be trained in using some simple machines for making handicraft. I do not speak Danish, but they brought some one who could translate for me. It was a good thing because I can support my self from selling handicraft to the tourists and it makes it possible for me to stay here in Kangerluk. It would be good if it was possible to create more new jobs that way.

Who wins and who looses
The people who lives in the settlements looses if nothing changes.

Names: Maja Møller Jensen, Justa Mørch and Camilla Markussen
Age: 15, 14 and 14 years
Towns of birth: Maja in Saqqaq. Justa and Camilla in Kangaatsiaq
Present residence: Ilulissat
Profession: pupils at public school

Where are we going?

We moved here to Ilullisat to finish public school. Most young people in the Greenlandic villages, like the ones we come from, like to move to the bigger cities. We are glad that it is possible for us to come here. There is more for teenagers to do in the larger cities. There is more fashionable here. It is more fun. We miss our families of course, but it is more fun to live in Ilulissat. There is a club for young people where we often go, and there are shops were you can rent videos. We watched all the High School Musical films.

We do not know much about industry and political development in Greenland. We have not discussed it at home or at school.

Is it desirable?

It is okay here. It is nice to live close to your friends and having new things to do, like go to the youth club etc. When we finish public school we would like to move to Denmark to attend a boarding school. It is important to get an education. Justa: I would like to go to high school and become a teacher in the future.

What should be done?

They should build a new college, to house the teenagers who come to stay here.
There should be more for young people to do.

Who wins and who looses

The villages becomes smaller and the cities becomes larger, but it for the best of the people. They can decide for them selves. It is best to get an education. An education gives opportunity for a better life.