

## Scarce Abundance

A critical analysis of Iceland's renewable energy sector in times of growth's cultural hegemony

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Master Thesis Series in Environmental Studies and Sustainability Science,  
No 2014:016

A thesis submitted in partial fulfillment of the requirements of Lund University  
International Master's Programme in Environmental Studies and Sustainability Science  
(30hp/credits)



# LUCSUS

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Submitted May 15, 2014

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## Abstract

Renewable energy is increasingly gaining currency as a sustainable substitute for fossil fuels. Iceland has been framed as one of the world's renewable energy success cases and the country's renewable energy production has multiplied in recent decades.

This thesis approaches Iceland's renewable energy sector from a critical perspective. It investigates the dominant discourse around the expansion of the energy sector in Iceland and its social and environmental consequences. The investigation was carried out by applying Hajer's argumentative discourse analysis. Empirical material was qualitatively collected through conducting 17 semi-structured interviews and analysing publicly available text-documents, radio and TV broadcasts. Quantitative data were gathered through a questionnaire and by reviewing official statistics. The material was analysed in light of Gramsci's concept of cultural hegemony. Additional concepts were employed to critically highlight flaws in the dominant discourse. These concepts are: Ecological modernisation, carbon fetishism and depoliticization.

The results show that a) the dominant discourse promotes an expansion of the energy sector at the expense of Icelandic nature, b) it does so – among other things – by contrasting capitalism's notion of scarcity with the notion of abundance attributed to Iceland's natural resources, c) the dominant discourse is heavily influenced by ecological modernisation (EM) and uncritically adopts its rationale and also its shortcomings, and d) the dominant discourse preserves its hegemonic status despite its inherent contradictions and negative side-effects by attempting to conceal conflicts over resource utilisation and by marginalising critical views. Despite the full adoption of EM as guiding principle for the expansion of the energy sector Iceland has not experienced the fulfilment of the promises that come with EM. In other words, a reconciliation of environment and economy has not taken place as is demonstrated by Iceland's growing CO<sub>2</sub> emissions and environmental degradation while companies in the energy sector experience ongoing financial difficulties.

This thesis concluded that environmental politics cannot be reduced to argumentative struggles, as Hajer suggests. Alternative discourses can only gain ground if the cultural hegemony of the dominant discourse is met with resistance on all levels of social life; in thoughts, norms and beliefs.

**Keywords:** Hydropower, geothermal energy, ecological modernisation, argumentative discourse analysis, carbon fetishism, depoliticization.

**Word count:** 14. 196

## Acknowledgements

First of all, I would like to thank my wonderful supervisor, Vasna Ramasar, for helping me disentangle my thoughts and feelings about Iceland and turn them into a topic for a master's thesis. Also, for valuable advice, careful comments and support and for being particularly generous with her time in the beginning when I couldn't figure out what to do. Finally, for responding calmly to my panicked e-mails!

I owe a great deal to the people I interviewed for this thesis. Their insights, knowledge and enthusiasm for Iceland's energy directed my work throughout this thesis and further sparked my interest and enthusiasm for Iceland's nature, its energy, and its (oftentimes ridiculous) politics.

I also thank the people who participated in my questionnaire. They reminded me that I'm probably not the only one shaking my head over the news in Iceland.

I would also like to thank people who have nothing to do with my thesis, but very much to do with my passion for the highlands and its future. My fellow rangers and nature-lovers: Takk, for many of the most valuable moments of my life. May we meet again in a small house between a mountain and a glacial river.

My dear Lumates. Thank you for being such a lovely bunch of open-minded and beautiful people and for surprising me from day one. It has been a privilege to share these two years with you. Thank you especially for the hikes, for food and coffee, for dancing like idiots to Balkan music, for friendship that will last.

To my two accomplices in crime, mes petits choux: Thank you for being there.

Finally, Henner. The list is long. I could not have done this without you – as you know. Thank you for listening to me ranting on about Iceland all the time and for all your invaluable support. But mostly, thank you for tolerating me when I couldn't tolerate myself.

This thesis is written for my father, the birdwatcher.

## List of Abbreviations

ADA – Argumentative discourse analysis

CO<sub>2</sub> – Carbon dioxide

EIA – Environmental Impact Assessment

EM – Ecological Modernisation

EU – The European Union

GHG – Greenhouse gas

HGE – Hydropower and geothermal energy

INCA – the Icelandic Nature Conservation Association (Náttúruverndarsamtök Íslands)

IPCC – The Intergovernmental Panel on Climate Change

MIL – The Icelandic Energy-Marketing Unit

NPA – The National Planning Agency (Skipulagsstofnun)

OR – Reykjavík Energy (Orkuveita Reykjavíkur)

SPREN – Special Report on Renewable Energy Sources and Climate Change Mitigation

UNFCCC – The United Nations Framework Convention on Climate Change

UST – The Environmental Agency of Iceland (Umhverfisstofnun)

*Les anneaux d'un serpent sont encore plus compliqués  
que les trous d'une taupinière*

Gilles Deleuze

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## 1. Introduction

In recent years, climate change has become one of the most pressing concerns of our times and reached the top of the international agenda. According to the latest assessment report (AR5) of the International Panel on Climate Change (IPCC), the “warming of the climate is unequivocal” and “many of the observed changes are unprecedented over decades to millennia” (IPCC, 2014a: 4). The scientific evidence further establishes that this development is driven by human activity and will pose great risks to both human and natural systems (IPCC, 2014b).

Increasing concentrations of greenhouse gases (GHG) in the atmosphere, particularly carbon dioxide (CO<sub>2</sub>), are the main drivers of anthropogenic climate change (IPCC, 2014a). In a 2009 article Rockström et al. identified a set of planetary boundaries that mark ‘a safe operating space for humanity’. According to the authors three boundaries have already been transgressed, with climate change being one of them (2009).

The energy sector is the largest contributor to global GHG emissions (IPCC, 2012). Transforming the world’s energy system towards lower GHG emissions is therefore critical for combatting climate change (Ibid.). In a Special Report on Renewable Energy Sources and Climate Change Mitigation (SPREN) of the IPCC, it is stated that “[r]enewable energy sources have a large potential to displace emissions of greenhouse gases from the combustion of fossil fuels and thereby to mitigate climate change” (IPCC, 2012).

Iceland is the world’s largest producer of energy per capita (Orkustofnun, n.d.-f) and almost 100% of all its electricity comes from renewable energy, i.e. hydropower and geothermal energy (HGE)(Orkustofnun, n.d.-h, 2014a).<sup>1</sup> It is recognised as a success case in the harnessing of renewable energy (IPCC, 2012; Lund, Freeston, & Boyd, 2011).

However, Iceland’s energy production is not unproblematic. Large scale harnessing of geothermal energy has caused environmental degradation and resource depletion (Arnórrsson, 2012; Axelsson, Gunnlaugsson, Jónasson, & Ólafsson, 2010). Secondly, the lifespan of the country’s biggest hydropower projects is limited and uncertain because the reservoirs that are built to regulate water flow will fill up with sediments as they are fed by glacial rivers (M. Jóhannsson & Magnúsdóttir, 2002; NPA, 2000). Additionally, energy production in Iceland often involves intrusions into areas that have previously been unspoilt or free from human activity, particularly the central highlands (Master Plan,

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<sup>1</sup> Iceland’s total energy production from these two sources in 2013 was 46.3 Petajoule (PJ) from hydropower and 170.7 PJ from geothermal energy, or ca. 85% of total primary energy use<sup>1</sup>. Almost 100% of the electricity production, or 17.5 TWh in 2012, comes from HGE.

2011; Þórhallsdóttir, 2002). A rapid expansion of the energy sector in the past two decades has therefore garnered criticism from a growing number of actors who claim Icelandic nature should be protected (G. P. Ólafsson, 2007). Thus, there is a tension between the expansion of the green energy economy and environmental protection in Iceland. An integrated systems perspective which takes into consideration the impacts of renewable energy is important to problematize 'green' energy.

Historically, Icelandic authorities and publicly-owned energy companies have supported the expansion of the sector while protection concerns have been raised by NGOs, scientists and increasingly by the public (Karlisdóttir, 2010). In many/several/a number of cases the struggles about energy projects have been won by the proponents of energy projects, thus affecting sites that hold high environmental and cultural value.

### **1.1 Aims and Research Questions**

In light of the above, the aim of this thesis is to study the discourse on energy in Iceland and uncover its normative commitments. I will attempt to show that a dominant discourse is defined by a particular way of seeing and understanding the world, which leaves little room for alternative approaches to issues of energy and nature protection. This hegemonic position of this discourse, I will argue, has fulfilled a key role in the development of the Icelandic energy sector, influenced political decision-making and served to conceal or suppress conflicts.

Secondly, I aim to locate the development of the energy sector in Iceland with respect to sustainability and renewable energy transformation. I take a critical perspective to understand the sustainability of renewable energy in Iceland and its socio-environmental impacts.

Throughout this work, I am guided by the following research questions:

**RQ 1.** What is the dominant discourse on energy in Iceland?

**RQ 2.** How has the dominant discourse been realised in the development of a renewable energy sector in Iceland?

**RQ 3.** Which are the most prominent entry-points for a critique of the dominant discourse?

**RQ 4.** Are there any indicators for where Iceland might be heading in the future?

RQ 1 forms the foundation of this work while RQ 2 addresses the material effects of the dominant discourse. RQ 3 investigates the potential for critique of the dominant discourse, finally, RQ 4 opens up the debate on future directions in energy development in Iceland.

## **1.2 Position in Sustainability Science**

Sustainability science is attentive to the reciprocal relationship between nature and society and studies the complex interactions between these two systems (Clark & Dickson, 2003; Perrings, 2007). My thesis sits within this research agenda and addresses society's responses to one of the key challenges of sustainability science, namely climate change (Jerneck, Olsson, Ness, & Anderberg, 2011).

I take a reflective position on climate change mitigation by offering a critical perspective on the renewable energy sector. I show how underlying dynamics of discourse and power shape choices, regardless of scientific knowledge and environmental concerns. I thus take a critical approach to research (Jerneck et al., 2011) by questioning the implicit justifications of current institutionalised responses to climate change.

## **2. Methodology**

### **2.1 Analytical Approach and Structure**

As my research questions indicate, the focus of my research is on discourse and its role in shaping reality. Therefore, discourse analysis becomes an obvious analytical approach. I have chosen to follow the framework provided by argumentative discourse analysis (ADA) as developed by Maarten Hajer (1995). ADA and its focus on *story-lines*, *discourse-coalitions* and *discursive hegemony* is particularly useful as I use them to unveil inherent power relations within the prevailing discourse. For a further discussion of ADA, see Appendix III.

ADA (Coffey & Marston, 2013) has been criticised for being insensitive or ignorant of the wider context of society and overlooking the influence non-discursive aspects of life can have on perceptions and norms in society. In view of that, I will, throughout my analysis and discussion, compliment ADA with theoretically informed concepts in order to gain a firmer grounding for my findings.

### **2.2 Ontological and Epistemological Considerations**

I am guided by the ontological perspective that social actors continuously create and recreate the social structure they inhabit (Moses & Knutsen, 2012). This thesis thus follows the constructivist tradition, distinguishing between the Real World and our perception of it (2012). This stance does not equal denying the existence of material phenomena external to our minds – in fact, I see in constructivism an honest recognition of materiality – but maintains that these phenomena ‘never speak for themselves’ and are always *made sense of* by us (Bettini, 2013).

This work is shaped by a view of knowledge as socially situated and intersubjective; created, obtained and given meaning through interaction (Moses & Knutsen, 2012).

### **2.3 Research Strategy and Methods of Data Collection**

This research is inductive in character as it seeks to generate a new understanding of a particular topic (Bryman, 2008), namely the implicit assumptions underlying the Icelandic energy sector. It applies mixed methods of data collection, complementing the main qualitative data with quantitative data (Ibid.) in order to link the discursive and the material elements of the Icelandic energy sector together through triangulation.

The major sources of empirical data were documents, gathered through a review of academic and non-academic literature, and 17 semi-structured interviews. While documents provided an authoritative source of information, semi-structured interviews offered a more flexible, open-minded engagement with the discourse on energy in Iceland (Bryman, 2008). Interviewees were selected by purposive sampling (Ibid.) based on the roles they occupied within the energy sector or the environmental movement in Iceland, or based on some expertise they had to offer.

I generated supportive quantitative data through a self-completion questionnaire, and gathered quantitative data by reviewing statistics on the energy sector. Interviews and questionnaire was conducted in Icelandic. I translated the quotes that appear in the thesis from Icelandic to English and other translations are also mine, unless mentioned otherwise.

Data collection and analysis took place in three main stages. During the initial stage, the focus of the research was established with the aid of a broad literature review, focusing specifically on the discursive elements of energy and environmental concerns in Iceland. Secondly, I conducted fieldwork in Reykjavík, Iceland, from February 21st to March 8th, where I did my interviews and carried out the questionnaire. The third and final stage involved analysing data from the field, which was done concurrently with a further review of literature in order to strengthen the theoretical framing of my analysis. See Appendix I for the questionnaire in English, the main results and information on sampling. See Appendix II for the interview guide in English and detailed information on the interviews.

Throughout data collection and interviews, I investigated three illustrative cases of energy development in Iceland to address the material expansion of the energy sector.

**Table 1.** After analysing the interviews, I categorised my interviewees as either narrative critics or narrative supporters. Although there were some overlapping views and concerns among narrative critics and narrative supporters, my final criteria for the division was whether people were critical of the underlying premises of the Icelandic energy sector (narrative critics) or not (narrative supporters). This I deduced e.g. from their perception of conflicts and trade-offs between energy development and nature protection, and their views of what the future of energy development in Iceland should be. This table presents only the names of the interviewees and the position they hold. See Appendix II for more detail.

Narrative Critics		Narrative Supporters	
Guðmundur Hálfðanarson	Historian	Ragnheiður Elín Árnadóttir	Minister of Industry and Commerce
Stefán Arnórsson	Geochemist	Helga Barðadóttir	Ministry of Industry and Commerce
Árni Finnsson	INCA, President	JG	Ministry of Environment
Guðmundur I. Guðbrandsson	Landvernd, CEO	ES	Ministry of Industry and Commerce
Þorbjörg S. Bakke	Grugg	Guðni A. Jóhannesson	Orkustofnun, Director General
Svandís Svavarsdóttir	Previous Minister of Environment; MP	Kristinn Einarsson	Orkustofnun
Þóra Ellen Þórhallsdóttir	Master Plan; botanist	Ragnheiður Ólafsdóttir	Landsvirkjun
Stefán Gíslason	Master Plan; env. consultant	Óli G. B. Sveinsson	Landsvirkjun
		Kjartan Sigurjónsson	Landsnet
		Ketill Sigurjónsson	Askja Energy Ltd.

## 2.4 Limitations to Study

First of all, this thesis is limited in scope due to time constraints and word limits. Many issues could have been pursued further and clarified in more detail. For example, I could not analyse in-depth the role of all the actors in the discourse on energy in Iceland (i.e. the discourse-coalition, see chapter 5). I chose to focus on those that I identified as key-actors, who also have direct influence on public policies in Iceland.

My position as an ‘insider’ in Iceland affects the research to some extent. As an Icelander I had preconceived ideas and assumptions about the research topic before I started working on this thesis. Being aware of this, I have attempted to be critical of my potential biases. However, it has also been valuable to know the cultural context of Iceland and speak the language. Furthermore, a great deal of the data I build on is in Icelandic, which is particularly challenging as language and the use of it is central in my analysis. It is inevitable that some subtleties of language get lost in translation.

Interpretive research has a clear subjective component to it. My own values have inevitably coloured the direction of this thesis and my selection of data.

I have chosen to discuss two modes of energy production in this thesis, geothermal energy and hydropower. These are two very different physical systems and their use as energy sources entails different scientific and technical challenges and limitations. However, they are both considered to be renewable energy sources and thus are treated similarly in Icelandic policies and strategies on energy, they are both used to generate electricity for heavy industry, they figure together in public and political debates on energy and environment and the vocabulary associated with them is very similar. I therefore judged it more coherent to address both of them for the purposes of this thesis.

### **3. Environmental Discourse on Sustainability and Renewable Energy: Theoretical Perspectives**

The following section is divided into four parts. First of all, I explain the notion of discourse in this thesis, particularly in the context of environmental politics. Then I introduce the concept of cultural hegemony which is central in my analysis and discussion of discourses. After that I introduce ecological modernisation (EM). Due to its substantial influence on environmental policies today (Christoff, 1996), I present EM as the current hegemonic discourse in environmental politics. Later (chapter 5.1.5), I link it to the discourse on energy in Iceland. Finally, I introduce concepts that I use to criticize the hegemonic discourse of EM (chapter 5.3) and the discourse on energy in Iceland (chapters 5.3 and 6.1).

#### **3.1 Environmental Politics as Discourse**

Broadly defined, discourse denotes a shared meaning of phenomena that serve to discipline and frame actions, norms and beliefs (Adger, Benjaminsen, Brown, & Svarstad, 2001; Bäckstrand & Lövbrand, 2006). Hajer (1995: 44) has further defined discourse as “a specific ensemble of ideas, concepts, and categorizations that are produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities.” This insight emphasises the nexus of institutions and agency in creating and transforming discourses. My understanding of discourse in this thesis and my approach to discourse analysis are informed by this understanding. Thus, I look for the reproduction of discourse at the institutional level, e.g. in policy documents, but also at the level of agency, e.g. in the worldviews of powerful actors. Secondly, discourse is not just shaped by practices, but also embedded in power relations and, as such, an important vehicle for knowledge-creation and agenda setting. Discourse can therefore serve to empower certain actors and favour certain descriptions of reality while marginalising other actors and alternative worldviews (Bäckstrand & Lövbrand, 2006). In view of this, I aim in my analysis to uncover which worldviews and actors become dominant and why.

Maarten Hajer (1995: 1) described environmental discourse as “an astonishing collection of claims and concerns brought together by a great variety of actors.” It is fragmented and contradictory at times, demonstrated e.g. by the innumerable working definitions of sustainable development. He also argues that environmental conflicts revolve essentially around the *interpretation* of environmental problems, and not whether they exist or not.

This understanding directs the attention of the researcher beyond studying political barriers to change towards inquiring into how environmental problems get defined, what definitions gain ground and what political consequences follow (Hajer, 1995). Environmental politics are thus seen as dependent on the “specific social constructions of environmental problems” (Ibid.: 2). This also means that in the process of finding solutions to environmental problems we in fact re-define these phenomena and reduce their complexity to a manageable scale.

In this thesis, I do not use the term *narrative* analytically, but as a referent for a particular story-line. Hajer (1995: 56) defines story-lines as “a generative sort of narrative”. Thus, the green-energy narrative is a story-line, and story-lines are a part of discourses. Arguably, I could have used the term story-line instead of narrative to emphasize its analytical status. The main reason for not doing that is simply that I had started using the term green-energy narrative before I became familiar with Hajer’s concept of story-line.

### **3.2 Cultural Hegemony**

The concept of cultural hegemony, as developed by the Marxist Antonio Gramsci, has found wide proliferation in the social sciences (Ekers, Loftus, & Mann, 2009). Cultural hegemony is useful in my thesis to understand how a particular discourse on energy became hegemonic in Iceland and how it remains hegemonic.

Cultural hegemony denotes a form of domination or leadership of society by a ruling-class that manipulates norms and belief-systems to secure political, social and economic order that benefits the ruling-class. Hegemony signifies the universal adoption of the norms and beliefs of the ruling-class by other social classes. This condition is established through a combination of coercion and consent, which explains why civil society might perceive the current socio-political order as favourable to everyone while it in fact only benefits the ruling-class (Callinicos, 2007; Ekers et al., 2009). This helps explain why social or institutional order that reproduces injustices can persist.

In Gramsci’s thought, power is not confined to any one sphere of social life but simultaneously acts in the spheres of the economic, cultural and political, none of which can stand in isolation (Ekers et al., 2009). A study of hegemony must take this into account and look for the reproduction of hegemony not just in conventional terrains of domination but also in “the social life of *thought* – norms, morality, common sense” (Mann, 2009).

### 3.3 Ecological Modernisation: The fix from within

*“The dirty and ugly industrial caterpillar will transform into a[n] ecological butterfly.”*

Joseph Huber

Ecological Modernisation (EM) emerged in the 1980s as a concept that has been defined differently by different scholars as technological innovation, policy response, or belief system (Berger, Flynn, Hines, & Johns, 2001; Christoff, 1996; Jänicke, 2007). It falls under the paradigm of weak sustainability, which is based on the notion of substitutability of natural capital with economic capital (Faran, 2010).

EM is premised on the idea that ecology and the economy can be reconciled in the quest for sustainability (Brand, 2010; Jänicke, 2007; APJ Mol & Spaargaren, 2000). It holds that the main challenge of sustainability is locating spaces for feasible action “within the context of existing institutions and power structures and continued economic growth” (Gouldson & Sullivan, 2012: 116). EM thus marks a break from the mainstream view in the wake of the publication of *Limits to Growth* in 1972 that a radical reorganisation of society’s institutions was necessary for achieving ecological balance (Arthur Mol, 2003).

As a technological adjustment, the process of EM denotes technological eco-innovation to bring about environmental improvement, a form of eco-rationalisation that adapts the market and industry to the challenges brought by environmental degradation (Christoff, 1996). Jänicke (2007) has framed it as a form of creative destruction whereby old patterns and forms of the previously destructive industry are replaced by new and environmentally-friendly ones. In this sense, EM has a narrow industrial focus (Christoff, 1996).

The appropriate tools and measures to address environmental degradation that EM suggests reside within the modern capitalistic system and are based on internalising costs of environmental damage, such as pollution (Panayotou, 1994). This is further founded on the notion of decoupling of environmental pressures from economic growth and resource use (Jänicke & Lindemann, 2010; Simonis, 1989). This decoupling is to be achieved through technological innovation and subsequent “greening” of industrial production and consumption processes. Declining energy and material intensity in OECD countries in the last three decades and improvements in resource efficiency are seen as a promising indicator for the success EM inspired policies can bring about (Jackson, 2009). Thus, Jänicke claims that no alternative approaches have the same potential “to radically reduce the environmental burden of industrial growth” (2007: 563).

Under EM, national government and the state have a supporting role in environmental reform and links between environmental and economic policies are strengthened. Jänicke (2007) and Jänicke

and Lindemann (2010) call for a turn from government to a more flexible, decentralised *governance*, privatisation and less market-intervention.

The proponents of EM nonetheless recognise that technical solutions to environmental degradation face certain limits. Jänicke (2007) acknowledges the dilemma of the rebound-effect, i.e. the neutralising of environmental improvements by economic growth, and the resistance to reform by so-called 'modernisation losers', i.e. powerful big-polluters such as old industrial companies that face lowering profits due to environmental reform. He (Ibid.) also acknowledges actual policy outcomes have not been impressive under EM and it therefore has to be complimented with some structural reform.

### **3.4 Critique from Alternative Spaces**

In this section I present theoretical concepts that offer valuable entry-points for a critique of EM and the discourse on energy in Iceland. These considerations will be employed in the Analysis together with ADA and in the Discussion as an overarching theoretical guide. I have arrived at these concepts inductively after studying the discourse on renewable energy in Iceland.

#### **3.4.1 Radical Change without Change**

##### *The Post-Political and Depoliticization*

The post-political or post-democratic condition is a radical philosophical concept that offers a critical reading of contemporary climate change/environmental politics.

The post-political signals the entry of technocratic management and politics of consensus where proper democratic politics and political struggles have been reduced down to social administration (Swyngedouw, 2011). It denotes "a political condition that has evacuated dispute and disagreement from the spaces of public encounter," as Erik Swyngedouw put it (2010: 215), and replaced it with a widespread agreement over existing conditions and appropriate action (Swyngedouw, 2011).

Swyngedouw (2010) identifies the post-political as socially homogenising as it frames environmental problems, notably climate change, as a disembodied enemy against which all of us must fight, regardless of our individual circumstances and interests.<sup>2</sup> It thus silences different ideologies and viewpoints so that all can unite around the cause, and prevents alternative views on how to

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<sup>2</sup> Another aspect of this is that environmental problems become unsolvable – unthinkable even – at the local and individual level. They are framed as *global* problems that require action at the more abstract, global level. For further discussion, see e.g. (Adger et al., 2001).

understand and tackle environmental problems from gaining ground. In this sense, the post-political society is a *closed* one and it “eludes choice and freedom (other than those tolerated by the consensus)”(Swyngedouw, 2010: 226).

### *The Climate Change Consensus*

In the case of the ecological crisis, as several scholars have noted (J. Foster & Clark, 2012; Moolna, 2012; Swyngedouw, 2010, 2013), the issue of climate change has been elevated to the top of the political agenda while other issues receive less recognition. In other words, a consensus has been reached on what climate change is and what the appropriate solution to it is. In their influential article on planetary boundaries, Rockström et al. (2009) state that the environmental problems of today cannot be tackled in isolation from one another as they are tightly coupled. This insight does not undermine the importance of tackling climate change but reminds us that curbing CO<sub>2</sub> emissions is not a panacea to all our environmental and resource-related problems.

Swyngedouw (2009, 2010, 2013) has argued that the climate change consensus is hegemonic and “radically reactionary” and that it “holds on to a harmonious view of Nature that can be recaptured while reproducing, if not solidifying, a liberal-capitalist order for which there seems to be no alternative” (2010: 228). In other words, Swyngedouw sees in the environmental discourse a disciplining power that strives to stabilise the status quo and its power is gained from de-politicising socio-environmental conflicts, i.e. conceal the struggles

### *Carbon Fetishism*

According to Swyngedouw (2010: 219) CO<sub>2</sub> has now become the “thing around which our environmental dreams, aspirations, contestations as well as policies crystallize.” In other words, CO<sub>2</sub> has been fetishized and this “has led to a conceptual focus on abstract carbon that excludes consideration of its wider context” (Moolna, 2012: 2). Carbon markets, trading regimes and treaties such as e.g. carbon offsetting and the Kyoto Protocol establish CO<sub>2</sub> as a commodity, “a perfect neoliberal object” (Swyngedouw, 2009: 612)(see also Bumpus & Man, 2008). Carbon fetishism lies at the heart of capitalism’s response to climate change, reducing not only our concerns with climate change down to CO<sub>2</sub> emissions, but also the terms ‘green’ and ‘sustainable’ down to a decontextualized ‘success’ in reducing emissions (Russell, 2012). Foster and Clark claim these efforts are nothing but “a renewed strategy for profiting from planetary destruction” (2009).

Renewable energy has thus been put on the international agenda, not least in the EU (see e.g. Hammons, 2008; Ringel, 2006), as one of the main responses to climate change (IPCC, 2012).

However, Byrne and Toly (2006) claim that too little attention has been given to critically analysing the premises of the current energy regime. They contend that a renewable energy regime would have the same leitmotif as the unsustainable one it is meant to replace, i.e. ever increasing energy production to drive more economic growth (Sayer, 2009). Apart from neglecting the negative environmental impacts renewable energy might have, its social implications are not necessarily beneficial (see e.g. Islar, 2014).

## 4. Case Background

### 4.1 Iceland: Basic facts

Iceland is a volcanically active island, situated on the Mid-Atlantic Ridge in the North Atlantic Ocean (Pálmason, 2005). With an area of 103.000 km<sup>2</sup> (Statistics Iceland, n.d.-a) and only 326.000 inhabitants (Statistics Iceland, n.d.-b) it is one of the world's most sparsely populated countries, though the population is expected to grow to ca. 420 thousand by 2050 (Statistics Iceland, 2014).



Considered one of Europe's poorest and least developed countries at the turn of the 20<sup>th</sup> century, Iceland's economy grew rapidly at the end of the century and the country now enjoys very high living standards (Pálmason, 2005). Although the financial crisis of 2008 hit the Icelandic economy and society hard, living standards remain high. The biggest industrial sectors are the fishing industry, aluminium production and the tourism sector.<sup>3</sup> Aluminium production began in 1969 and there are now three aluminium smelters in operation, producing 790 thousand tonnes of aluminium per year (Samtök iðnaðarins, 2009a). The tourism sector has expanded rapidly, or by 54% between 2009 and 2012, and exceeded both the fishing industry and aluminium production in terms of foreign exchange for the first time in 2013 (Landsbankinn, 2013).

### 4.2 The Energy Sector

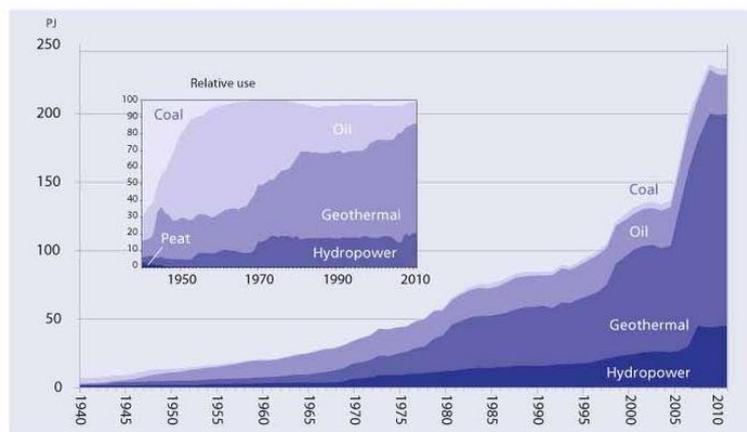
Apart from fisheries, Iceland's main resources are hydropower and geothermal energy, which are harnessed for district heating (geothermal) and electricity (geothermal and hydro). Both energy sources have been utilised to some extent since the beginning of the 20<sup>th</sup> century. Harnessing of geothermal energy for district heating grew rapidly in the 1970s, partly in reaction to the international oil crises, so that nine out of ten Icelanders now have access to district heating powered by geothermal energy (Orkustofnun, n.d.-b). In 1970, geothermal energy was used for the first time for electricity generation (Landsvirkjun, n.d.-a) and the same year the river Þjórsá became Iceland's first glacial river to be harnessed to support heavy industry.

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<sup>3</sup> Iceland imports the bauxite and the ore needed for aluminium production.

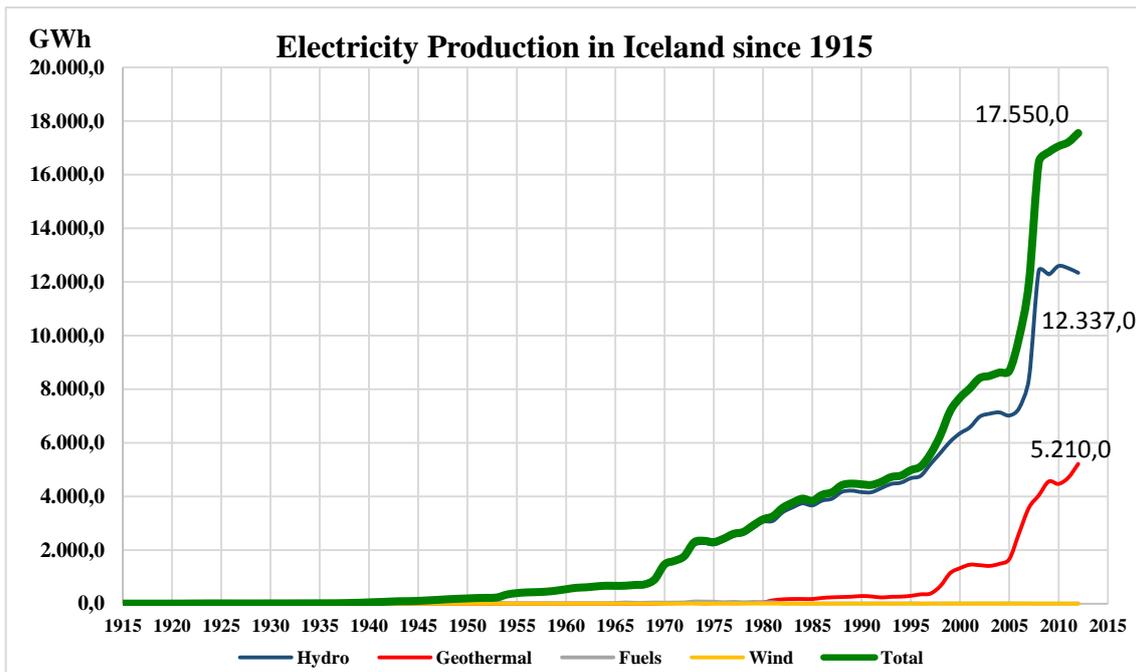
Two of the main characteristics of the energy system in Iceland are the relatively low price of energy and the intensity of energy production and consumption in the country. Iceland is now by far the world's largest electricity producer and also the world's largest energy consumer per capita (Orkustofnun, n.d.-f). This is mainly due to consumption by heavy industry.

85% of primary energy use in Iceland is from hydropower and geothermal energy, while 15% comes from imported oil and coal. Oil and coal consumption has been relatively stable in recent decades but use of hydropower and geothermal energy has multiplied (**Figure 1**).



**Figure 1.** This graph gives an overview of the expansion of energy use in Iceland since 1970 and especially since the turn of the Millennium. The expansion is a result of electricity generation for the aluminium industry. Geothermal energy is the biggest energy source and has doubled in output in less than a decade. Hydropower also doubled from ca. 2005 to 2010. Oil and coal are mainly used for transport. PJ = Peta Joule. (Source: (Orkustofnun, n.d.-j))

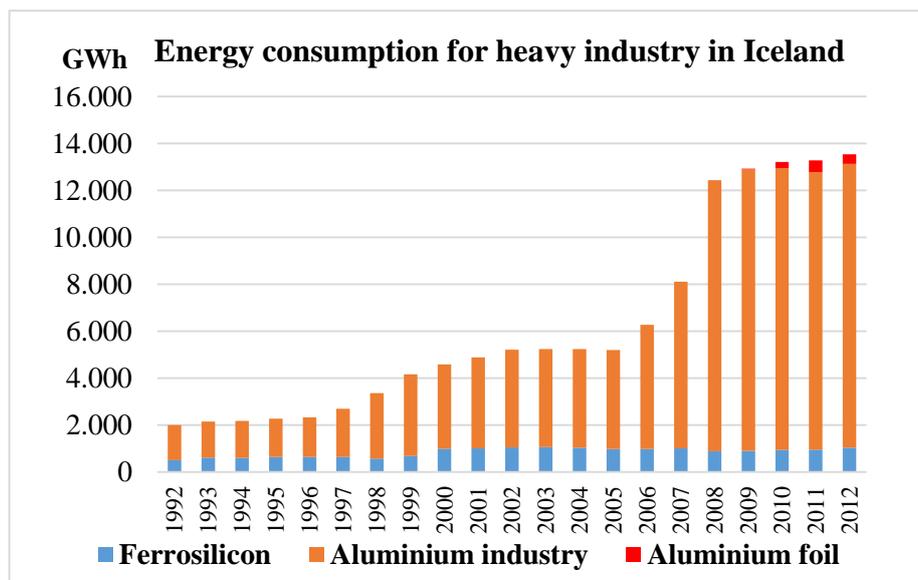
43% of the geothermal energy are used for district heating. However, electricity production from geothermal energy has grown rapidly in the last two decades (**Figure 2**).



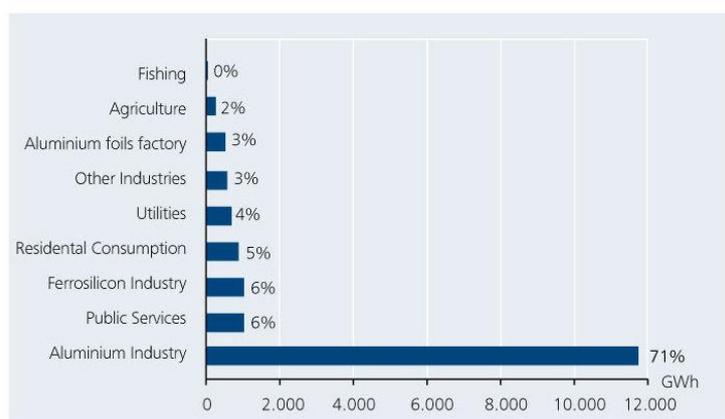
**Figure 2.** 70.3% of the electricity in Iceland is produced from hydropower, or 1885 MW of installed capacity (12.337 GWh/yr). Production from geothermal energy has increased recently and now accounts for 29.7% of the total production or 659 MW installed capacity (5.210 GWh/yr) while only a fraction, or 0.02%, come from fossil fuels. (Source: Adapted by author from (Orkustofnun, n.d.-h)).

While electricity consumption by non-aluminium related activities has grown steadily or by a couple of per cent every year (Orkustofnun, n.d.-a), aluminium production has claimed the bulk of the increased capacity (**Figure 3**)(**Figure 4**). The three aluminium smelters in Iceland, owned by Icelandic subsidiaries of Rio Tinto Alcan, Alcoa and Century Aluminum, have a production capacity of 790 thousand tonnes aluminium per year (Samtök iðnaðarins, 2009b).

In spite of this rapid increase in energy production from hydropower and geothermal energy, Iceland has harnessed less than half of the country's total exploitable (hydro) energy and tapped into 6 of 19 high-temperature geothermal fields, and differs in this respect from many other European countries (Þórhallsdóttir, 2007b). However, there is currently little demand for increased production except from aluminium companies.



**Figure 3.** In 2012, the aluminium industry in Iceland required 71% of the total electricity use, having grown from 1.495 GWh in 1992 to 12.502 GWh in 2012. (Source: (Orkustofnun, n.d.-e))

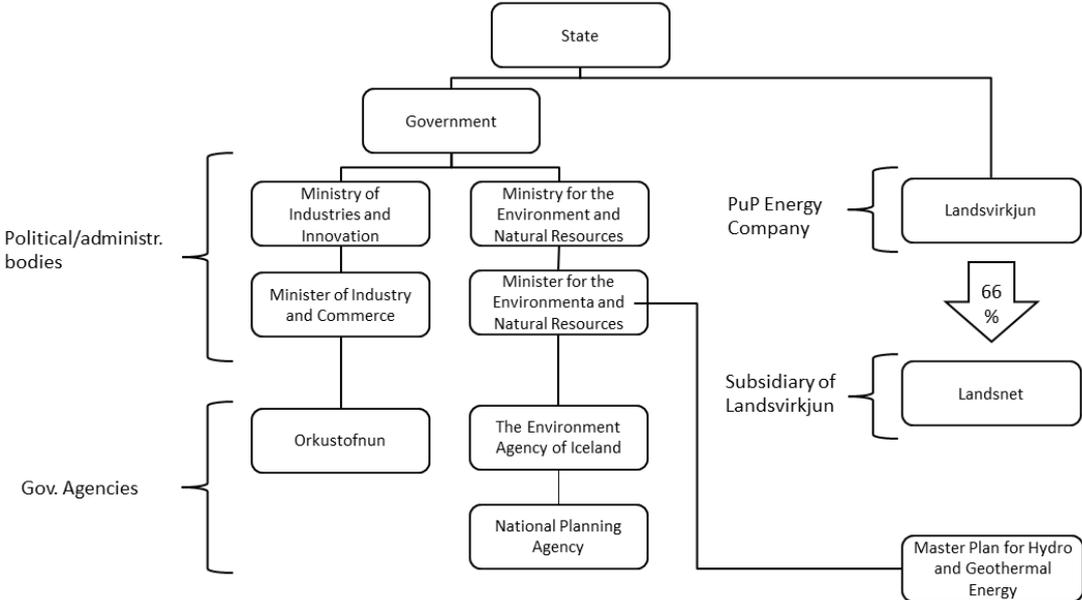


**Figure 4.** The share of different sectors in electricity consumption in Iceland in 2012. (Source: (Orkustofnun, n.d.-d)).

Energy and utility companies in Iceland are mostly publicly-owned, i.e. by the state and the municipalities. In 1965, Landsvirkjun (the National Energy Company) was founded and assigned the role of building and operating energy infrastructure (including reservoirs, dams, heating utilities and the electricity transmission system). The Icelandic state owns a 100% share in Landsvirkjun and the company currently produces 70% of all electricity in Iceland (Orkustofnun, n.d.-g).<sup>4</sup> Orkustofnun (the National Energy Authority) was founded in 1967. It is a government agency under the Ministry of

<sup>4</sup> Until 2003, when Alþingi (The Icelandic Parliament) adopted a new Energy Act based on an EU directive (92/96) on internal electricity markets, Landsvirkjun produced up to 85% of all electricity in Iceland. The new Energy Act opened up the electricity market to other energy companies, creating a free-market environment. Currently, four of Iceland's six electricity producers are public companies.

Industry,<sup>5</sup> responsible for licencing and monitoring energy exploitation, regulating the utility and distribution system and advising the Icelandic government on energy issues as well as conducting energy research (Orkustofnun, n.d.-c).



**Figure 5.** A diagram showing the public administrative and political bodies most relevant for the energy system. (Source: Made by author).

**4.2.1 The Master Plan for Hydropower and Geothermal Energy**

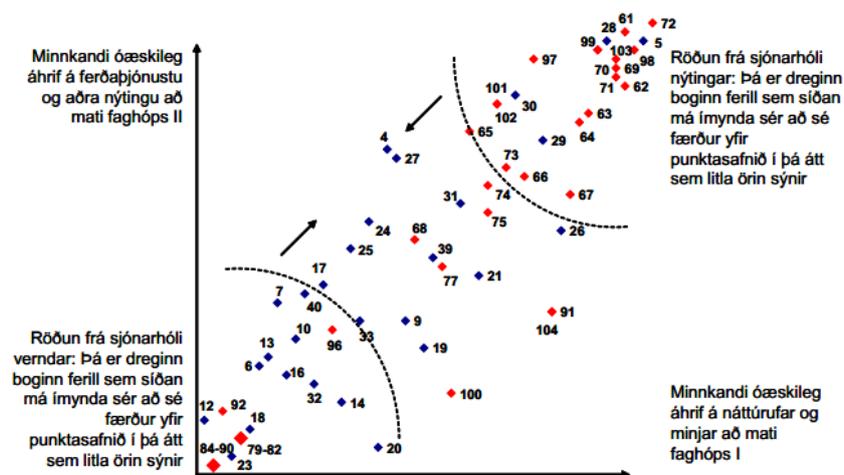
The Master Plan for Hydropower and Geothermal Energy Resources (from now on Master Plan) was initiated in 1999 by the Ministry of Industry and the Ministry of the Environment. Its objective was to “provide a comprehensive national-level policy basis for the sustainable use of potential hydropower and geothermal resources” (Þórhallsdóttir, 2007a, 2007b). It is carried out in three phases, 1999-2003, 2003-2011 and the thirds phase is under way since 2013.

The Ministry of Environment commissions special steering committees for each phase, which are supported by working groups of experts and professionals, e.g. natural scientists (Master Plan, n.d.). These specialised working groups evaluate ca. 100 power projects based on a) *impacts of the project* (economic, social and environmental factors, regional development and impacts on landscapes, cultural heritage, use and recreational value) and b) *the protection value of the area* in which the power project is placed (taking into account biodiversity, landscape, cultural monuments, geological

<sup>5</sup> Currently the Ministry of Industry and Innovation, where the Minister of Industry is responsible for Orkustofnun.

monuments etc.) (**Figure 6**). Finally, projects are categorised according to the outcome of the working groups along two axes (impacts vs. value) in either protection or utilisation. Some projects that fall in between get re-evaluated in a later phase.

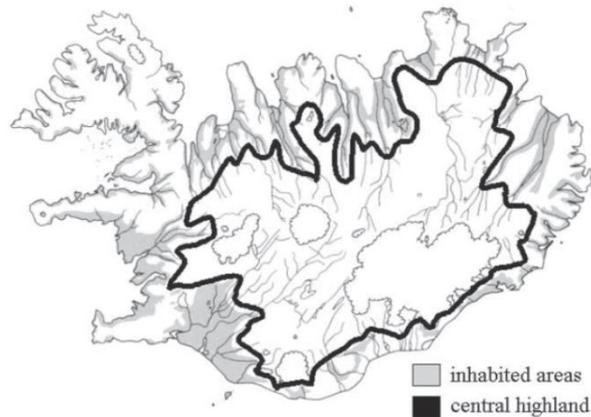
The Master Plan does not replace EIAs, which are project-based and have to be carried out for each project that falls under the utilisation category before energy harnessing can begin. Rather, it takes place on a higher level of policy and planning and is meant as a response to the shortcomings of EIAs, e.g. in accounting for cumulative effects of energy development (Þórhallsdóttir, 2007b).



**Figure 6.** The categorisation of power projects under the Master Plan. High values on both the x-axis and the y-axis indicate low negative impacts (in this case for nature and cultural heritage (x-axis) and recreational value and other use (y-axis)) and low values indicate high negative impacts. Blue dots indicate hydropower projects and red dots indicate geothermal projects. The curved lines in each corner mark the protection category (bottom left) and the utilisation category (top right), and the arrows demonstrate how the valuation process progresses towards the middle, providing a balance between use and protection. (Source: (Master Plan, 2011)).

### 4.3 The Highlands

Most of Iceland’s hydro-electricity production today, as well as most of the potential future sites for both geothermal and hydropower plants, is located in Iceland’s interior, the highlands (**Figure 7**).



**Figure 7.** The central highlands cover almost half of Iceland's area. Most of Iceland's large hydropower projects are located in this area, as the area's topography provides suitable conditions for building reservoirs and utilising vertical drop. (Source: (Þórhallsdóttir, 2002))

In general, the term *highland* denotes most of Iceland's interior, or half of the country's area (ca. 50.000 km<sup>2</sup>). It is an uninhabitable highland plateau characterised by isolated mountains and large glaciers (Þórhallsdóttir, 2002), from which the country's numerous glacial rivers originate (Ibid). The highlands are largely devoid of infrastructure except for gravel roads, mountain huts and energy infrastructure.<sup>6</sup> The area is practically bereft of vegetation and most of it is classified as desert. The only undisturbed areas of vegetation (ca. 5% of total area) are concentrated around river catchments and headwaters and, consequently, are often found in places that are also suitable for energy development (Hálfdanarson & Karlsdóttir, 2005, 188-189).

The highlands have long been a place of wonder and mystery for Icelanders, and an inspiration for folklore and stories about ghosts and outlaws (Þórhallsdóttir, 2002). From the 17<sup>th</sup> till the late 19<sup>th</sup> century, very little was actually known about the highlands as few ventured to travel there. In recent decades, partly due to the growing tourism sector, the interest in the highlands for recreation and outdoors activities has been revived (G. T. Jóhannesson & Huijbens, 2010; Sæþórsdóttir, 2010).

#### 4.4 Energy Projects in Iceland: Cases of Conflict

In this section I introduce three illustrative cases of energy projects that have caused controversy in Iceland and become a nation-wide bone of contention. They are all located in or close to protected natural areas of rich biodiversity and unique landscapes and they have been sought after for

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<sup>6</sup> The highlands are practically bereft of vegetation and most of the area is classified as desert. Research has shown (Arnalds et al., 2001) that the highlands once had a much more extensive vegetation cover but severe land degradation, initiated by obtrusive land use and grazing practices early after human settlement, has stripped the land of its soil cover

electricity production for heavy-industry. These cases will be discussed further in the analysis (chapter 5.2).

#### 4.5.1 Þjórsárver and Norðlingaalda Reservoir

South of Hofsjökull glacier, at the headwaters of glacial river Þjórsá, lies an area called Þjórsárver, 600 m above sea level (**Figure 8**). It is the most extensive, undisturbed vegetated area in the highlands with an unusually diverse flora and fauna, the biggest permafrost area in Iceland, and the world's biggest breeding ground for the pink-footed goose (*Anser brachyrhynchus*)(E. Ólafsson et al., 2009). It was declared a nature reserve in 1981 and has been protected under the RAMSAR convention since 1990 (Umhverfisstofnun, n.d.). Due to its ecological diversity, unrivalled elsewhere in the highlands, and as a remnant of an almost lost biotope, Þjórsárver is considered to be nationally and internationally valuable (E. Ólafsson et al., 2009).



**Figure 8.** Location of river Þjórsá, Þjórsárver and Norðlingaalda, the site of the proposed reservoir. Source: Based on map from Landmælingar Íslands. Þjórsárver covers 960 km<sup>2</sup>, of which 146 km<sup>2</sup> are vegetated. The nature reserve is 358 km<sup>2</sup> but does not include all the vegetated area. (Adapted by author from: [http://www.lmi.is/wp-content/uploads/2014/04/1\\_3M.pdf](http://www.lmi.is/wp-content/uploads/2014/04/1_3M.pdf))

As of today, Landsvirkjun operates six hydropower stations in Þjórsá<sup>7</sup> below Þórisvatn reservoir, the largest lake in Iceland (88 km<sup>2</sup>), which was created to regulate the water flow to the power stations. In 1949, the company proposed to build a reservoir in the upper part of Þjórsá, 2 km south of the current boundaries of Þjórsárver nature reserve, by a place called Norðlingaalda. The project, i.e.

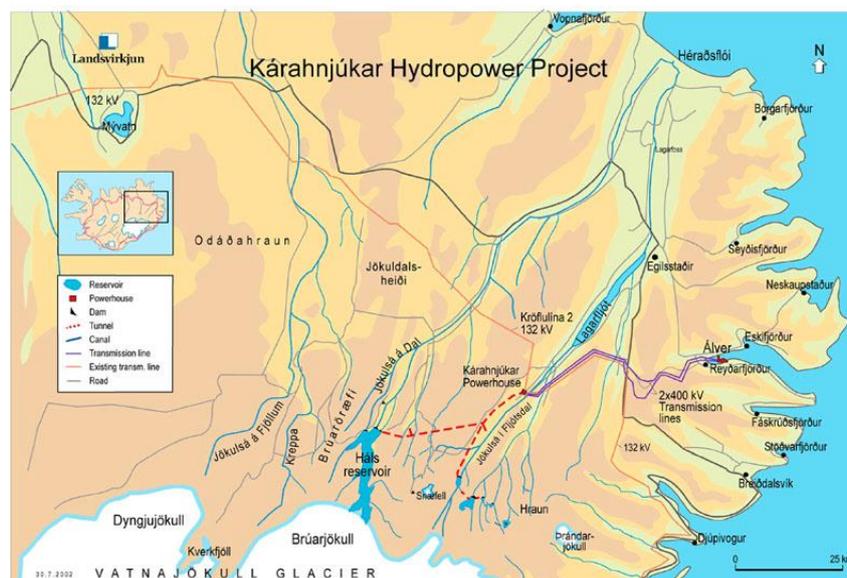
<sup>7</sup> More precisely, this also includes the river Tungnaá, which originates in Tungnafellsjökull glacier northwest of Vatnajökull. Tungnaá used to flow eastwards to join Þjórsá, but is now diverted through Kvíslaveita dams into Þórisvatn reservoir, resulting in a 40% loss of water volume in Þjórsá.

different versions of the dam, has been in the pipelines since but has not come into operation, not least due to nature protection concerns (G. P. Ólafsson, 2007).

Although it is not contended anymore that Þjórsárver should be protected, disagreements remain as to the boundaries of the reserve, and Landsvirkjun still intends to build a smaller version of the originally proposed dam by Norðlingaalda<sup>8</sup> and transport the water through underground tunnels towards Þórisvatn. The resulting increase in production is meant to power an aluminium smelter in Helgúvík, Reykjanes Peninsula (Norðurál, 2013).

#### 4.5.2 Kárahnjúkar Hydropower Project

In 2003, Landsvirkjun embarked upon Iceland's biggest energy project to date, the Kárahnjúkar hydropower project in the eastern part of the highlands (**Figure 9**). The project is commonly referred to as *Kárahnjúkavirkjun* (Kárahnjúkar hydropower project) as the biggest dam of the three, 198 metres tall and 700 metres wide, is located by mountain Fremri-Kárahnjúkur (Landsvirkjun, n.d.-b). It produces electricity for an aluminium smelter in Reyðarfjörður, which is the biggest one in Iceland and produces 360 thousand tonnes of aluminium annually (Alcoa, 2014).



**Figure 9.** An overview of the area of Kárahnjúkar hydropower project. The project consists of three dams in the river Jökulsá á Dal, two small reservoirs and dams in river Jökulsá í Fljótsdal, Háslón reservoir and a power station in Fljótsdalur (Fljótsdalsstöð), where electricity is generated and transported to Alcoa Fjarðaáls' (subsidiary of Alcoa) aluminium smelter in Reyðarfjörður, one of the fjords in the east. The power station and the aluminium smelter came into operation in 2007. The power station has an installed capacity of 690 MW and generation capacity of 4800 GWh/yr. (Map: <http://www.geotimes.org/aug02/WebExtra0801map.html>)

<sup>8</sup> at 566-567.5 m a.s.l.,

One of the areas that went partly under Háslón reservoir was Kringilsárrani at the edge of outlet glacier Brúarjökull. Kringilsárrani had been a protected area since 1975 due to its robust vegetation cover and its value as a grazing area for Iceland's reindeer population, but the protection was revoked in 2003 by the Minister of Environment at the time in order to enable the construction of Háslón reservoir (G. P. Ólafsson, 2007; Vatnajökulsþjóðgarður, n.d.). Iceland's deepest river canyon, Hafrahvammagljúfur, was mostly submerged by Háslón, and with it established breeding grounds for the pink-footed goose were lost. It has been estimated that at least 100 waterfalls in the two glacial rivers disappeared as a result of the project, as well as unique geological formations, landscapes and undisturbed wilderness, and these impacts are irreversible (Einarsson, 2001).

In 2000, the National Planning Agency (NPA) issued an environmental impact assessment (EIA) of the project and rejected it on the basis of severe negative, irreversible environmental impacts (NPA, 2000). However, Landsvirkjun appealed to the Ministry of Environment, and the Minister decided to override NPA's decision, claiming that national economic and societal benefits of the project superseded environmental concerns (J. P. Jóhannsson, 2013).

#### 4.5.3 Hellisheiði Geothermal Plant

The geothermal power plant Hellisheiði is located in a geothermal field in central volcano Hengill, ca. 20-30 km away from Reykjavík. It is owned and operated by Reykjavík Energy (Orkuveita Reykjavíkur, OR), a public utility company that is co-owned by three municipalities. It is a combined heat and power plant, with installed capacity of 303 MW of electricity ( $\text{MW}^e$ ) and 133 MW thermal energy ( $\text{MW}^{\text{th}}$ ) for district heating (OR, n.d.).



**Figure 10.** A map of the southwest corner of Iceland and Reykjanes peninsula. (NB The city of Reykjavík is actually missing from the map, but it is located between Seltjarnarnes and Kópavogur).

(Adapted by author from: [http://www.lmi.is/wp-content/uploads/2014/04/1\\_3M.pdf](http://www.lmi.is/wp-content/uploads/2014/04/1_3M.pdf))

The power plant was built between 2006 and 2011 in anticipation of a new aluminium smelter in Helguvík, Reykjanes Peninsula (Norðurál, 2013), which would be owned by Norðurál Grundartangi Ltd., a subsidiary of Century Aluminium (see Norðurál, n.d.) and largely powered by Hellisheiði plant (Viðskiptablaðið, 2012).<sup>9</sup> The company claimed that the smelter in Helguvík would be one of the world's most environmentally friendly smelters ("Century Aluminum's Norðurál Plant, Helguvík, Iceland," n.d.) However, soon after the final construction stage of Hellisheiði power plant, it became clear that it would not support full production capacity for long (OR, 2013a). Production had dropped to 276 MW<sup>e</sup> in 2013<sup>10</sup> and is expected to drop by a few per cent every year, placing OR in a difficult financial situation and putting plans for an aluminium smelter in Helguvík on permanent hold.

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<sup>9</sup> The smelter was meant to require 450 MW electricity and have a production capacity of 360 thousand tonnes aluminium.

<sup>10</sup> Output of geothermal water has not declined but is less than originally expected.

## 5. Analysis

Based on Hajer's ADA, I have studied the energy discourse in Iceland and identified a particular story-line as the hegemonic discourse. I will refer to it as the green-energy narrative. This story-line draws on discourses on the environment and sustainability, but it has also internalised an older story-line which is built on the framing of HGE as one of the main pillars of Iceland's prosperity. The green-energy narrative, particularly in recent years, has consolidated and been exposed through discursive struggles with alternative story-lines, e.g. with the environmental movement.

After analysing the green-energy narrative below (chapter 5.1), I discuss three cases that illustrate the hegemonic status of the green-energy narrative and demonstrate how it has influenced the material expansion of the energy sector in Iceland (chapter 5.2). Thereafter, I present the main criticism offered against the green-energy narrative without attempting to frame that criticism as a coherent story-line (chapter 5.3), as I believe there are *many* alternative story-lines at play in the discourse on energy in Iceland (see e.g. I. Á. Jóhannesson, 2005 for a discussion of three discourses).

The green-energy narrative can be summarised as follows (see **Table 2.** below for a summary of the main assumptions and opposing claims):

- *The story-line:* Iceland's economic prosperity depends on the harnessing of nature's resources, particularly HGE. Further energy production and development of heavy-industry is inevitable if we want to keep living standards high. HGE sources are renewable and green and are used sustainably in Iceland. In the face of climate change, it is Iceland's responsibility to the world to produce more green energy and contribute to lowering the world's ecological footprint that way. This does not jeopardise Icelandic nature because energy development and nature protection can go together.
- *The discourse-coalition:* Key actors: Orkustofnun, Landsvirkjun and other energy companies, public institutions, the government, political parties and politicians. Other actors: The Icelandic aluminium companies<sup>11</sup>, the Association of Aluminum Producers in Iceland (SAMÁL) and engineering firms, (sometimes) municipalities where energy development takes place.<sup>12</sup> Additionally, the media, the public and the tourism sector play indirect roles through reproducing the story-line. The practices within which the discourse-coalition reproduces the story-line are e.g. politics, official policies, political debates, public debates, a particular use of language and concepts, PR efforts (by companies) etc.

According to Hajers' ADA, discourse-coalitions form around story-lines and not interests. Therefore, I do not claim that all parties to the discourse-coalition necessarily profit from maintaining the story-line. Evidently, that is an important issue to study but it is largely beyond the scope of this thesis.

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<sup>11</sup> Subsidiaries of Alcoa, Rio Tinto Alcan and Century Aluminum.

<sup>12</sup> The media and the tourism industry sometimes play a supporting role, but I will not focus particularly on their role.

**Table 2.** An overview of the main underlying assumptions of the green-energy narrative contrasted with alternative perspectives.

	<b>Green-energy Narrative</b>	<b>Criticism/perspectives from alternative story-lines</b>
Economic assumptions	Resource utilisation as foundation for prosperity.	Resource utilisation as foundation for prosperity, but no need for more/other pillars also important.
-----//-----	Economic growth necessary. Growth overrides other interests of society.	Economic growth only a part of a healthy society.
Decision-making	Economic tools and expert-knowledge as foundation for decision-making. Management rather than politics	Economic tools not sufficient when it comes to the energy sector.
Relationship with nature	Utilitarian view of nature. Man as steward of nature. Anthropocentric.	Humans as stewards or a part of nature. Mostly anthropocentric but eco-centric views exist.
Views on nature	(Icelandic) nature as first and foremost a resource and economic foundation. Iceland as unique.	(Icelandic) nature as mainly a cultural heritage, and source of freedom and identity. Iceland as unique.
Views on resources	Nationalistic. Resources belong to Icelanders. Emphasis on the right to use the resources.	Nationalistic. Resources belong to Icelanders, but emphasis on the right of future generations to enjoy wilderness and nature.
Rationality	Instrumental rationality dominant. Little tolerance for 'ideologies' or 'emotions'. Nature valued for its use-value.	Open to other ways of knowing and seeing. Ideology valued. Nature valued for its abstract/aesthetic value and intrinsic value.
Energy	The energy in Iceland is green, renewable and used in a sustainable way. Positive towards heavy-industry and a substantial increase in energy generation.	Critical of the claims that energy in Iceland is green, renewable and used sustainably. Energy cannot be green if the highlands are sacrificed for it. Negative towards selling more energy to heavy-industry.
Energy and nature	Energy can be (and is) reconciled with nature protection and tourism/other use.	Energy development and nature protection do not go together, nor with tourism/other use.
International perspectives	Producing energy from RE seen as a contribution to fighting climate change.	Preserving nature as wilderness seen as a contribution to the world.
Sustainability	Economic pillar as foundation for overall sustainability.	Nature cannot be substituted with capital.

## 5.1 The Green-Energy Narrative

*“The prosperity and independence of the Icelandic nation began when nature’s forces were harnessed for the sake of the economy.” (Eliasson & Pétursson, 2003)*

### 5.1.1 Historical Roots: ‘Tinder Light in the Dark Desert’

The origins of the green-energy narrative can be traced back to the early 20<sup>th</sup> century when industrialisation began in Iceland. It coincided not only with Iceland’s progression towards independence<sup>13</sup> but also with the harnessing of HGE for district heating and electricity (see chapter 4.2). This development was driven by politicians, entrepreneurs and poets such as Einar Benediktsson (Karlsdóttir, 2010: 23-26):

How we might improve the lot of our country and nation  
By placing a mighty arrow on your bow-string  
Using rightly the energy in the plunging water [...]   
Thus, we might furrow life from the sheet of death  
And tinder light in the dark desert  
By the pulsating energy in your electric veins.

*Einar Benediktsson - Dettifoss<sup>14</sup>*

This verse summarises neatly the mentality of those years, and the faith that was placed on hydropower in getting the country out of poverty. Harnessing the ‘dead’ energy in the rivers would ‘tinder light in the dark desert’ and bring prosperity (Karlsdóttir, 2010: 32). Around the same time people’s attitudes towards the glacial rivers changed. They became potential sources of wealth and a key to future prosperity (Hálfðanarson, 2005), while unharnessed they “served no one” and were a mere nuisance, impeding travel and communication (Karlsdóttir, 2010: 32). The power balance between man and nature shifted in the minds of Icelanders (Ibid: 35) and this marked the beginning of the commodification of rivers – and waterfalls particularly – as they became popular investments. Views on nature and resources subsequently became strictly utilitarian (Árnason, 2005) and nationalistic (Hálfðanarson, interview). The coupling of independence and prosperity with resource use would grow and solidify in coming decades (Árnason, 2005: 17-18).

Around the middle of the century a comprehensive energy strategy began taking shape in Iceland, resulting in the founding of Landsvirkjun (1965) and Orkustofnun (1967) (see chapter 4.2). In 1969, Orkustofnun claimed there were at least 35.000 GWh (35 TWh) of harnessable hydropower in the country<sup>15</sup> and put forward plans to dam all the biggest glacial rivers to generate electricity for heavy

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<sup>13</sup> Iceland became a sovereign state in 1918 and gained full independence from Denmark in 1944.

<sup>14</sup> This verse is taken from Benediktsson poem *Dettifoss*. The title is the name of Iceland’s most powerful waterfall in glacial river Jökulsá á Fjöllum. Translation from (Hálfðanarson, 2005: 189).

<sup>15</sup> For comparison, Iceland generated roughly 17 TWh altogether from HGE in 2013.

industry, i.e. aluminium smelters. These plans were made with some urgency, as it was generally thought that nuclear energy would render hydropower unprofitable within the next decades (Hálfdanarson, 2005). The most staggering idea involved channelling all the glacial rivers in the Northeast<sup>16</sup> to a big reservoir northeast of Vatnajökull glacier – a project that was called Austurland Power Project and later was realised to some extent in Kárahnjúkar Power Project in 2003-2007.

Subsequently, concerns were raised by nature protectionists that clashes might occur between the energy sector and nature protection (Karlsdóttir, 2010). To that, Orkustofnun's senior engineer (and later director) Jakob Björnsson had a clear answer:

“A sensible discourse on nature protection in this country in the future is bound to take into account one central assertion and be based on it. That is, that the nation intends to live in this country and enjoy similar standards of living in the future as those who are most prosperous in the world. [...] To live in this country will, in the future, signify the full utilisation of its natural resources [...]. It is very important that this conclusion is at the heart of all discourse on nature protection in the future.

And, furthermore:

The main concern of the nature protectionist is not if but how. Not if Gullfoss<sup>17</sup> should be harnessed, but how.”

Interestingly, Björnsson did not simply dismiss the views of those who claimed nature should be protected. Rather, he subordinated nature protection to energy generation and reduced its purpose to a supporting role, and by doing that he influenced the way nature protection was – and is – perceived in Iceland: As a sub-category to industrial expansion.

For the later half of the 20<sup>th</sup> century, these attitudes governed the discourse on energy in Iceland and shaped policies on energy and the environment.

### ***5.1.2 Energy in times of Sustainable Development – ‘The Whole World is at Stake’***

#### *Lowest Energy Prices!! and the Government's White Book on Energy*

When the concept of sustainable development entered the political scene in Iceland in the 1990s, it brought with it a new incentive to expand the energy sector. The Brundtland-report (World Commission on Environment and Development, 1987) had called for the development of low-energy pathways based on renewable energy and categorised both hydro-power and geothermal energy as renewable energy sources. This invited the argument that it was Iceland's duty to the world to

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<sup>16</sup> Jökulsá á Dal, Jökulsá á Fljótsdal and Jökulsá á Fjöllum, where Dettifoss is. The word jökuls-á literally means glacial-river.

<sup>17</sup> Gullfoss waterfall (E. The Golden Waterfall) in river Hvítá is Iceland's most famous waterfall.

increase its energy production from the country's renewable sources to lower global GHG emissions. Thus, a dimension was added to the story-line: Now it was not just the prerogative of the Icelandic people to harness the resources for progress and prosperity but it suddenly became a contribution to the fight against climate change (see e.g. Hálfdanarson & Karlsdóttir, 2005; I. Á. Jóhannesson, 2005).

Icelandic authorities created a favourable climate for investment in heavy industry in the next years by adopting flexible tax policies and by introducing energy prices that the government claimed to be "lower than anywhere else in Europe and North America" (MIL, 1995). Furthermore, energy authorities embarked on an assessment of Iceland's potential production capacity (The Ministry of Industry, 1994), later referred to as the White Book on energy, and began marketing the country as attractive for foreign heavy-industry companies.

For these purposes, the Icelandic Energy Marketing Unit (MIL),<sup>18</sup> published a brochure in 1995 titled *Lowest Energy Prices!!* In it, it is stated that utilising Iceland's energy sources to drive economic growth is "high on the Government's priority list".<sup>19</sup> Under the heading *Power in Plenty without Pollution*, MIL claims that:

"Iceland has clean hydro and geothermal energy resources which are still largely unutilized. These energy resources are abundant in relation to present and projected future domestic demand in Iceland. Economically harnessable hydropower from a number of small and medium-size power plants with *relatively little environmental impact* is estimated at 30,000 GWh/yr while comparable geothermal resources are estimated to be about 20,000 GWh/yr. *The total potential for electricity production from both sources is thus estimated to be about 50,000 GW/yr at a sufficiently low cost to be of interest to power-intensive industries [...].*"<sup>20</sup> (Italics mine)

Furthermore, it is stated that "[h]ydropower and geothermal energy are clean, non-polluting, self-sustainable sources of energy" and that energy-intensive industries using this energy "contribute towards protecting the global atmosphere",<sup>21</sup> although this is not explained further. With regards to environmental impacts and EIA, the brochure promises "minimum environmental red-tape" and claims that good solutions have been found in Iceland for "handling the environmental impacts of the new power-intensive industries." The brochure was published a year after EIAs were legalised for

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<sup>18</sup> MIL is an independent agency of the Ministry of Industry and Energy, was founded in 1988 with the main aim of promoting and marketing Iceland's energy resources. It seeks investors in the power-intensive industries and fosters the direct export of power (Mackay & Probert, 1996: 248).

<sup>19</sup> The same parties formed the government at the time as today, Sjálfstæðisflokkur and Framsóknarflokkur.

<sup>20</sup> Considering the fact that Iceland now generates ca. 17,000 GWh/yr after a substantial expansion in the last few years, 50,000 GW/yr seems like a bold estimate.

<sup>21</sup> The brochure also advertises Iceland as "nature at its purest", with the "freshest air you will ever breathe and the purest water in the world".

the first time and there was no experience of that process at the time, so it is unclear what these solutions represent or how the authorities interpreted “relatively little environmental impact”.

The White Book on Energy bears clear testimony to the authorities’ will to attract heavy-industry. In the document, basically all glacial rivers and geothermal fields in Iceland are presented as harnessable with very little or no environmental impact. However, it is also stated that the White Book is intended to establish the reconciliation of energy production and nature protection. In view of the authorities’ actions the years following the publication of the White Book, e.g. in the case of Kárahnjúkar power project (see chapter 5.2.2), it is difficult to interpret this as anything but the subjection of nature protection to energy production (The Ministry of Industry, 1994).

### *Iceland and the Kyoto Protocol*

Historian Hálfðanarson has noted that “the modern environmental discourse has been used more effectively in promoting the energy intensive industries in Iceland rather than opposing them” (Hálfðanarson, 2005: 199). The examples above support his claim, and so does Iceland’s approach to the Kyoto Protocol.

The delegation to the UNFCCC convention in Kyoto 1997 successfully argued that Iceland should be exempt from emission commitments due to its unique position in terms of renewable energy sources<sup>22</sup>. Iceland was then granted further exemptions based on a special decision adopted into the Protocol in Marrakech in 2001 at the bequest of the Icelandic delegation (referred to as Decision 14/CP.7)(I. Á. Jóhannesson, 2005).<sup>23</sup>

A recent report issued by the Environmental Agency of Iceland showed that in 2012, net GHG emissions were 26% higher in Iceland than in 1990. Emissions from heavy-industry have increased by 116% since 1990<sup>24</sup>. Iceland’s ‘green’ energy sector has thus enabled the country to radically increase its GHG emissions (“Viðmiðum Kyoto náð en vistsporið risastórt,” 2014). Thus, the recognition of UNFCCC has been used to drastically expand Iceland’s energy sector and it is applied as an argument in the debate on what to do with Iceland’s resources (Karlisdóttir, 2010; see Landsvirkjun, 2007, 2011).

This shows how the current international efforts to fight climate change lay the foundation for prioritising CO<sub>2</sub> emissions over other environmental concerns.

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<sup>22</sup> Iceland was allowed to raise emissions by 10% until 2012.

<sup>23</sup> Without this exemption in 2001, the Kárahnjúkar Power Project would have caused Iceland to exceed its emission limits.

<sup>24</sup> Net GHG emissions of Iceland were 3500 tonnes in 1990 and 4500 tonnes in 2012 of which industrial processes accounted for 1883 tonnes.

### **5.1.3 The Story-line Established: ‘Clean, non-polluting, self-sustainable’**

The green-energy narrative is now firmly established in politics and policies on energy in Iceland. When asked to comment on the publication of IPCC’s fifth assessment report in March 2014, the Icelandic prime minister Sigmundur Davíð Gunnlaugsson said that Iceland’s energy sector was probably the most environmentally friendly in the world, and that it would now be Iceland’s duty to the world to harness more of the renewable energy sources it had in store (RÚV, 2014a). The director of Orkustofnun and the Minister of Industry, when I interviewed them in relation to this thesis, both expressed similar views:

“Yes, yes, that’s what we are doing [reducing the world’s ecological footprint by producing aluminium from renewable energy in Iceland], because the aluminium smelters that are not built here are built in Qatar and Algeria instead and are fuelled by gas and have an ecological footprint 8-10 times higher than here. So it would require a lot of imagination to maintain otherwise.” (Jóhannesson, interview)

“We have to realise that the whole world is at stake. [...] If we are thinking of our social responsibility to the world, and we don’t use the energy we have, we have to understand that the industry will be built elsewhere and then driven by coal and oil which is worse for all of us.” (Árnadóttir, interview)

This demonstrates how the proponents of the energy sector have adopted the moral obligations of the climate change discourse and aligned it with a vision of an expanding energy sector.

Bjarni Benediktsson, then party leader of the Independence Party and now also Minister of Finance, claimed in 2012 that “Iceland cannot afford a regressive energy policy,” implicitly but clearly indicating the perceived necessity of expanding the energy sector (DV, 2012). A regressive energy policy would entail, he said, refraining from using the country’s energy resources, which would be unwise and irrational – which are terms often associated with those who oppose further energy development. In an interview with me, the current director of Orkustofnun expressed similar views as Benediktsson and Björnsson, Jóhannesson’s predecessor.

“It’s not necessary [to build more power plants in order to keep living standards in Iceland high]. We could live without all this. On the other hand, we do aspire to keep living standards at a certain level, and we are still quite a long way off, we have not reached the same level as our neighbouring countries. And we don’t do that by sitting on our asses. We have to make use of what we have. [...] Our development efforts cannot be funded on misanthropy, we assume Icelanders mean to live here, to provide for themselves, to develop, and the population will grow. So we will conquer more unspoilt areas. [...] We can never say ‘nature is here and here we draw boundaries and here nothing will be done.’ Because this is not the way society functions and it never will be.” (Jóhannesson, interview).

Ceasing to develop more areas for energy production – i.e. “sitting on our asses” – would equal bringing the country “back to 1940” in terms of living standards “and we are certainly not interested

in going there again.” Expanding the energy sector and building more aluminium smelters is the only remaining choice in this matter. However, it is clear that the pressure to expand in the last few decades has come from foreign aluminium companies such as Alcoa and Century Aluminum but not domestic users of electricity or hot water (Alcoa, 2008; RÚV, 2013d)(also Hálfðanarson, interview; Guðbrandsson, interview). Thus, the expansion is not about improvement of living standards through the provisioning of electricity and district heating to households, but can be seen as an example of the development that started in the 1970s, namely the production of energy to serve heavy industry.

#### **5.1.4 Language and discourse production**

Icelandic energy companies utilise the green label of Iceland’s energy as a marketing tool. In a 2009 publication titled *Meet Iceland – a Pioneer in the Use of Renewable Resources*, Iceland's energy system is described as clean, renewable and environmentally sound, and Iceland as “one of the world's greatest potential sources of renewable energy” (Orkustofnun, 2009). All of these terms are used consistently in Orkustofnun's publications, such as annual reports (Orkustofnun, 2012, 2013) and on its homepage where HGE is described as green and sustainable (Orkustofnun, n.d.-i). Landsvirkjun markets the use of HGE as renewable and sustainable (Landsvirkjun, n.d.-c, 2007, 2012) and itself as a leader in renewable energy (Landsvirkjun, 2011).

Icelandic authorities continue to be the key actors in maintaining the story-line. In the current government's manifesto it is stated that “Iceland holds a unique position with regards to environmental affairs on the basis of its unspoilt nature and sustainable use of renewable resources” (No author, 2013). Not surprisingly, the government has talked very positively of expanding the energy sector (see e.g. Árnadóttir, 2013; Gunnlaugsson, 2013). Mr. Ólafur Ragnar Grímsson, the President of Iceland, has been a strong proponent of this view, both in Iceland and abroad, stating on various occasions that “100% of our electricity production and 100% of house heating is provided by domestic, renewable resources: hydro and geothermal,” describing the development of the HGE sector as a “clean energy transformation” (Grímsson, 2013).

Unavoidably, public perception of the energy system is influenced by the political discourse, as acknowledged by many of my interviewees:

“I think the predominant attitude is that it's all just great and perfect. Environmentally friendly, sustainable, renewable and all that. [...] If you ask all Icelanders I think the greatest majority of them would go along with that.” (Gíslason, interview)

The results of the questionnaire I carried out support this claim (see Appendix I for more detail):

Questionnaire Question	Agree or Strongly Agree
3. Hydro and geothermal energy are renewable and environmentally sound sources of energy	70% (24 out of 34)
8. Energy production in Iceland is sustainable	56% (19 out of 34)

### ***5.1.5 The Green-energy Narrative as EM***

The discourse on energy in Iceland has become increasingly economic and industry-friendly, namely in its framing of aluminium as a green metal and with policies that are tailored to the interests of international industrial companies (see chapter 5.1.2). It is based on an assumption that nature and energy production can be reconciled and that economic growth can be adjusted to avoid environmental destruction. This is a view shared by many of the most influential people in the energy sector today (Jóhannesson, interview; Árnadóttir, interview; Einarsson, interview; Ólafsdóttir, interview; Barðadóttir, interview).

The change in the discourse on energy and environment in Iceland since the 1990s and Iceland's adoption of flexible policies on energy production are clear signs of the process of EM. These policies are premised on the notion that the problems brought about by energy production can be fixed by different kinds of energy production or improved technology and that the rationale of the capitalistic market system and modern institutions does not have to stand in opposition to the environment.

Icelandic energy authorities' focus is first and foremost on continued economic growth. This reflects capital's cultural hegemony in Icelandic energy politics and vividly demonstrates the influence of EM on the Icelandic energy sector.

### **5.2 The Green-energy Narrative in Practice**

In this section, I discuss the cases presented in chapter 4.4 as illustrative examples of the material impacts of the green-energy narrative in Iceland. I attempt to demonstrate the hegemonic status of this discourse through the analytical lens of ADA and the theoretical perspectives presented above (Chapter 3.4).

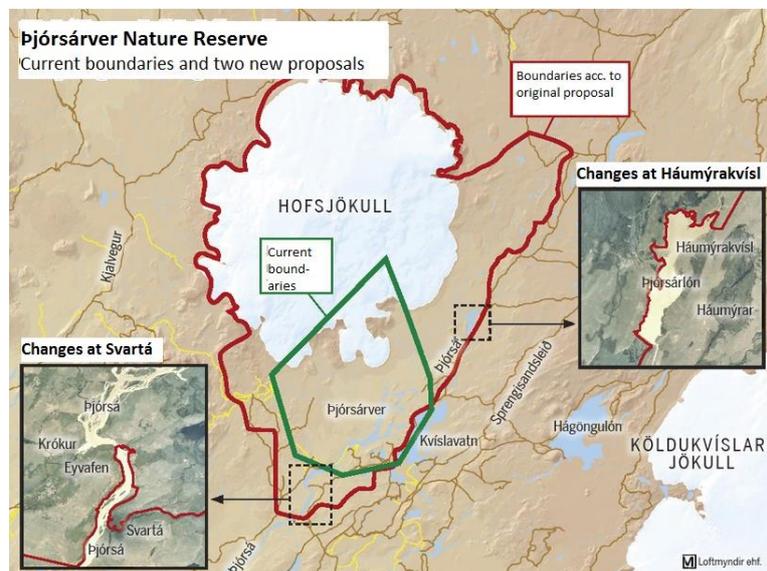
### 5.2.1 Þjórsárver and Norðlingaalda Reservoir

“In political reality, to argue against routinized understandings is to argue against the institutions that function on the basis of specific, structured, cognitive commitments.” (Hajer, 1995: 57)

“[O]ne should analyse in which practices discursive dominance is based and by what means specific contentions are furthered.” (Hajer, 1995: 60)

On June 21, 2013, the Minister of Environment, Sigurður Ingi Jóhannsson, was scheduled to sign a proposal to expand the boundaries of the nature reserve in Þjórsárver considerably. The proposal was in accordance with the outcome of the second phase of the Master Plan, which had rejected the construction of Norðlingaalda reservoir due to its potential negative environmental impacts. The new proposal would eliminate Landsvirkjun’s hopes of building the reservoir<sup>25</sup> and mark the end of the debate over Þjórsárver, which had lasted more than four decades (RÚV, 2013c).

On the morning of June 21, it was announced that the Minister would not sign due to Landsvirkjun’s requests that the matter of Norðlingaalda reservoir be reopened (RÚV, 2014d). In January 2014, the Minister proposed new boundaries (**Figure 11**) and Norðlingaalda reservoir was back in game (RÚV, 2014c).<sup>26</sup>



**Figure 11.** Þjórsárver Nature Reserve. The green line indicates the current boundaries of the nature reserve and the red one shows the new boundaries as proposed by the previous Minister of Environment, in accordance with the outcome of the Master Plan. The detail shows the changes made to the proposal by the current Minister of Environment, after Landsvirkjun requested to build a smaller version of Norðlingaalda reservoir, which would be located by the tributary Svartá. Source: (Guðbjörnsson, 2013).

<sup>25</sup> Norðlingaalda reservoir, 566-567,5 m above sea level.

<sup>26</sup> This decision did not amount to licencing the construction of the reservoir, but enabled Landsvirkjun to put forward a new version of it to be processed in the next phase of the Master Plan.

The Ministry justified its decision by stating that the boundaries of the area suggested for protection according to the Master Plan were geographically unclear and that the new proposed changes were “minor” (Umhverfisstofnun, 2013) and would not affect the Þjórsárver area as a whole.<sup>27</sup> Minister Jóhannsson further said that he would, when it came to it, heed the expert verdict of the EIA that would have to be carried out before Landsvirkjun could build a smaller version of Norðlingaalda reservoir, and added that he felt it was very important that politicians did not make “political decisions by intervening in such things” (RÚV, 2014e).

Over the next days and weeks (January 2014) the Ministry was harshly criticised (Einarsdóttir, 2014; RÚV, 2013c, 2014b) for ignoring the scientific case for including Norðlingaalda in the nature reserve, manipulating the decision-making process and enabling the development of energy infrastructure in a previously unspoilt area. The harshest criticism of all came from the experts of Working Group II of the Master Plan, the natural scientists who had rejected the Norðlingaalda reservoir. In an open letter to the Minister, they asserted that the boundaries as proposed by the Master Plan had been very clear (Guðjónsson, 2014). They further claimed that Jóhannsson was wrong in stating that the changes to the proposal were “minor”:

“Speaking in such terms does not indicate a deep understanding of the conservation value of the area. What is being cut out [in the Minister’s proposal] is certainly a low percentage of the whole surface area of the nature reserve. However, the heart of the matter is that this change would involve considerable intervention into the landscape and wilderness in Þjórsárver. Thus, the boundaries of the nature reserve are tailored to the needs of the power project, and do not take nature’s value into account” (Guðjónsson, 2014).

In an interview on public TV, Jóhannsson criticised the scientific experts for “considering themselves to be politicians” who “can write articles and fight for their opinions”, indicating that they no longer deserved to be called “experts” if they participated in the public debate on Þjórsárver (Thorsson, 2014). He thus attempted to exclude critical voices from the political sphere. The scientists, on the other hand, claimed that they were only pointing out the flaws in the Ministry’s interpretation of the Master Plan. Having previously declared his willingness to abide by the rule of experts, Jóhannsson’s critique raises questions whether *some* experts are more acceptable than others, or perhaps whether politicians are only willing to follow experts’ advice when it happens to coincide with their own political opinions or the interests of the energy sector.

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<sup>27</sup> The Minister admitted that three waterfalls below the reservoir, considered to “have very high nature protection value”(Master Plan, 2011), would be severely affected were the reservoir to be built, but pointed out that the waterfalls had not been included in the previous proposal either. While technically correct, these waterfalls were one of the reasons why Norðlingaalda reservoir had been rejected in the Master Plan (Ibid.).

Clearly, the assumptions underlying the green-energy narrative get translated into concrete policies and institutionalised responses in Icelandic energy politics, which is an indicator of discursive hegemony (Hajer, 1995). Thus, the scientists who criticised the Minister were up against administrative structures that are premised on the view that Iceland's resources are to be utilised to the full. The fact that the Ministry of the Environment interprets technical detail in the Master Plan in favour of the energy sector is only one example of the deep-rooted commitment to this view. Furthermore, the framing of the new proposal as a "minor" change is an attempt to suppress conflicts regarding this decision. This reveals the intolerance a depoliticized discourse has for alternative views.

The future of Þjórsárver and Norðlingaalda is still undecided. However, this course of events exposed the discursive hegemony of the green-energy narrative.

### **5.2.2 Kárahnjúkar Hydropower Project**

"[E]nvironmental politics becomes an argumentative struggle in which actors not only try to make others see the problems according to their views but also seek to position other actors in a specific way. Hence it is not as if actors do not have an intuitive idea about discourse theory, in actual fact they constantly practice it." (Hajer, 1995: 53)

"What the Icelandic nation doesn't have is knowledge about the land. We have all these emotion [...] but no natural scientific knowledge." (Ólafsdóttir, interview).

In the late 1990s, when it became clear that Kárahnjúkar hydropower project would become reality, public resistance against dedicating vast areas in the highlands to energy generation was growing (Karlsdóttir, 2010).

Landsvirkjun and the government reacted to this by reminding Icelanders that utilising the country's resources could not be avoided and that power lines should be seen as "signs of progress", and not as nuisances (Ibid.: 164). Economic benefits were underlined – although several prominent economists challenged claims of the alleged economic profit due to high construction costs and low energy prices (Matthíasson, 2005; Siglaugsson, 1999) – and other issues, such as damage to ecosystems and the disappearance of more than a hundred waterfalls, were framed as necessary trade-offs (Karlsdóttir, 2010; Magnason, 2007).

The Minister of Environment at the time, Siv Friðleifsdóttir, was in favour of the project due to its alleged economic benefits to the whole nation (Karlsdóttir, 2010: 166). When an EIA carried out by the NPA rejected the project due to its negative, irreversible environmental impacts (NPA, 2000), Friðleifsdóttir decided to override the verdict and grant the approval of the Ministry of Environment to build the reservoir.

This sparked a public outcry and demonstrations in Reykjavík. In addition to concerns about nature and the ecosystems in the area, natural beauty, wilderness and the value of the highlands as the nation's cultural heritage were raised as reasons for rejecting the project. Landsvirkjun and the government's response to this was to frame such views as sentimental and irrational and subsequently avoid confronting them (Ó. P. Jónsson, 2007). A poster published by Landsvirkjun captures this view clearly:

Valid arguments, calculations and facts show that harnessing energy from the rivers is in the nation's best interests.

Emotions also matter...

... but it is important to employ them adequately, appropriately, on the right issue, for the right reasons and at the right time.

Do you think that decisions regarding the harnessing of rivers should be taken on the basis of feelings rather than arguments?

Source: (Pálsdóttir, 2005: 106)

This perspective permeated Icelandic society during those years and the environmental movement as a whole, as well as others who raised criticism, became associated with irrational sentimentality (Pálsdóttir, 2005). They were accused of taking a stance against progress and prosperity (Magnason, 2007) and of hypocrisy, because they claimed to care for the environment but opposed harnessing the green energy that Iceland had to offer (Karlsdóttir, 2010). This shows how the environmental discourse has been used to promote heavy-industry in Iceland.

Now, seven years after the project was completed and the aluminium smelter in Reyðarfjörður came into operation, the environmental impacts of the project are evident but the economic benefits not. The socio-economic benefits for the society in the East were much lower than expected (H. Jóhannesson, 2010) and there are strong indications that the project did not make sense economically (see chapter 5.3.3).

The ecosystem in Lake Lagarfljót, into which the glacial river Jökulsá á Dal<sup>28</sup> is now diverted, has collapsed according to a recent report (VMST, 2013). With the sediments from the glacial rivers, the lake is now too murky for light to penetrate. Another report (Arnalds, Svavarsdóttir, & Aradóttir, 2010) shows that the vegetated area around Háslón has suffered from Aeolian deposits that get suspended when the water levels in the reservoir drop. Damage to landscapes and geological formations is irreversible, as predicted (Einarsson, 2001).

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<sup>28</sup> Previously, Jökulsá í Fljótsdal ran into Lake Lagarfljót, but now Jökulsá á Dal is also diverted into the lake. The latter river is the murkiest of Iceland's glacial rivers (due to high concentration of suspended particles).

According to Hajer's ADA, actors who participate in the discursive struggles that characterise environmental politics "seek to position others in a specific way" (1995:53) in order to gain or keep discursive dominance. It is clear that in the debate on Kárahnjúkar, the proponents of the energy sector attempted to frame any opposition as irrational and unjustified. Characterising critics as irrational is to render them unfit to partake in a political debate that is seemingly based on the exchange of rational arguments. Thus, depoliticization takes place through the exclusion of actors (critics) and arguments (framed as irrational) from the political arena. What remains is only what fits the dominant discourse which has emerged as *the only remaining alternative*.

### **5.2.3 Hellisheiði Geothermal Plant**

"To deconstruct a policy discourse and find that it is to be understood as the unintended consequences of an interplay of actions is one thing, more interesting is to observe how seemingly technical positions conceal normative commitments." (Hajer, 1995: 55)

Contrary to expectations, Hellisheiði geothermal power plant did not turn out to be the success case it was expected to be. Problems have been experienced with earthquakes due to the pumping down of excess water (OR, 2012), H<sub>2</sub>S pollution in air and waterways in and around Reykjavík has become a health risk (Gunnarsson, Aradóttir, & Sigfússon, 2014; "Mengað affallsvatn í grunnvatni," 2011) and other toxic emissions have killed moss and other vegetation around the power plant (EFLA, 2009). Finally, production capacity is falling, which is evidence for unsustainable resource use (Arnórsson, 2012; No author, 2012), and only 12-15% of the energy tapped from the geothermal field is harnessed due to technical limitations – the rest is released as excess water and toxic emissions (Arnórsson, interview)(OR, 2013a). All of this has caused great financial problems for OR and the municipalities that own the company (OR, 2013a), which are eventually shouldered by the tax-payers of the three municipalities that own OR.<sup>29</sup>

But what went wrong at Hellisheiði? According to the company itself (OR, 2013a), the main problem is that expectations of generation capacity were founded on speculations and very limited empirical evidence of the capacity of the geothermal field (Hávarðsson, 2013; OR, 2013a). Geophysicist Sveinbjörn Björnsson (RÚV, 2013b) and geochemist Stefán Arnórsson (interview) concur, and add that scientists' warnings regarding overexploitation of the resource were systematically ignored when the power plant was built. Furthermore, geothermal energy is in fact a non-renewable resource and energy extraction has to take that fact into account (Arnórsson, 2012; Pálmason, 2005; Sanyal, 2005). Arnórsson (interview) emphasises that geothermal energy should never be utilised for heavy industry, as was planned with the energy from Hellisheiði, because it is impossible to assert

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<sup>29</sup> For a discussion of OR's financial situation, see (Sigmundsdóttir, 2009).

beforehand how much energy particular geothermal field will yield, although this is done repeatedly in Iceland.<sup>30</sup>

In the case of Hellisheiði, OR simply treated the geothermal field as an inexhaustible reserve of “readily available” energy without supporting this perspective with scientific evidence. Arnórsson explains that the underlying problem is that computer modelling and abstract calculations have replaced geology as the scientific foundation of geothermal energy extraction:

“It is impossible to treat these calculations as facts, but this is what they are doing. You cannot speculate, you have to *measure*, and you need the natural scientific background to know what to measure. [...] These people, they don’t seem to think rationally. [...] You see how I understand this, it’s all there on the table. But people don’t want to talk about it. I experience that very strongly, it’s as if they are scared shitless of me because they *know* that I know, having been involved in this for half a century. [...] This is nonsense. This is not rational thinking. But people stubbornly defend themselves, and mostly with the silence.” (Arnórsson, interview)

In short, the production capacity of the geothermal field in Hellisheiði was drastically over-estimated because expectations were built on speculations rather than scientific data. Critique was left unanswered or silenced, scientific knowledge selectively ignored and rationality suspended – all under the banner of economic growth. The result was an economic and environmental disaster.

The experience with Hellisheiði geothermal plant is an indicator of how dominant the green-energy narrative is in Icelandic energy politics and demonstrative of the effects of carbon fetishism. Thus, assumptions about the capacity of the geothermal field in Hellisheiði were not just neutral calculations – they were based on normative commitments to expanding the energy sector without considering the limitations of the physical system itself, nor the potential environmental impacts of the energy production. This demonstrates the need for a more integrated approach to renewable energy projects.

### 5.3 Critique from Alternative Story-lines

In this section, I present some of the main points of contention between the green-energy narrative and its alternative story-lines<sup>31</sup>.

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<sup>30</sup> The EU and the U.S. Ministry of Energy classify geothermal energy as a renewable resource but Arnórsson (2012: 91) has stated that “this classification is not based on the nature of this resource but a reflection of environmental policy”.

<sup>31</sup> As mentioned earlier (chapter 5), I do not attempt to give a coherent idea of these alternative story-lines, but use them to draw out weaknesses in the green-energy narrative.

**5.3.1 Nature as a Cultural Heritage**

One of the main criticisms of the green-energy narrative is rooted in a different view of nature, although also it is anthropocentric. Instead of valuing nature first and foremost as a source of economic prosperity and as a resource (i.e. use-value), an alternative perspective values nature as Icelanders’ source of freedom and identity and as the nation’s greatest cultural heritage. Nature has indeed shaped Icelanders’ identity (Árnason, 2005; Hálfðanarson & Karlsdóttir, 2005) and has in many ways come to represent *Icelandicness* (I. Á. Jóhannesson, 2005). In a 1997 survey on nature and national identity in Iceland and two other Nordic countries, the *landscape* was found to be the most important national symbol in Iceland (not in the other two countries) (Árnason, 2005: 112).

I asked the people who participated in my questionnaire to describe it in a few words. The outcome is presented in the word cloud below.



**Figure 10.** Vastness captures both *víðátta* and *víðerni*, meaning “a land of distant views.” The words *ósnotin* and *óspillt* (pristine and unspoilt, respectively), are often used interchangeably in Icelandic.

Further results from the survey also cast light on the participants’ perspectives on nature and specifically the status of the highlands:

Questionnaire Question	Agree or Strongly Agree
2. Icelandic nature is characterised by unspoilt and undeveloped wilderness	82% (28 out of 34)
12. The Icelandic highlands have an important status in the country’s history and the nation’s identity	91% (31 out of 34)

16. Future generations have the same rights to experience Icelandic nature and wilderness as previous generations.	97% (33 out of 34)
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In view of this, nature should not be sacrificed thoughtlessly for energy generation (Karlisdóttir, 2010: 31-35) as nothing less than Iceland’s cultural identity is at stake. The characteristics that make it unique and precious for Icelanders will vanish if too much land is dedicated to energy production (G. P. Ólafsson, 2007; Þórhallsdóttir, 2002)(Guðbrandsson, interview). When these perspectives are brought to the table in environmental debates, the proponents of the green-energy narrative have a very clear, succinct reply.

“Having positive feelings about nature, that’s one thing. Being willing to make some sacrifices, that’s another thing...” (Jóhannesson, interview)

In other words, sacrificing some of nature for energy generation is framed as an unavoidable trade-off, with an implicit reference to the prosperity energy generation provides. This serves to silence criticism and positions those who are critical of the energy sector as uncompromising and unrealistic. It also implies that there is no choice in this matter. The socially and ideologically homogenising impacts of the post-political condition are evident. Of course, what this conceals is the choice that has *already been made* by those who are in power, namely to expand the energy sector at the cost of nature.

### 5.3.2 Scarce Abundance

The prevailing view in Iceland has been that the country’s resources are “just about inexhaustible” and can be harnessed ad infinitum (Hálfðanarson, interview). It is clear that within the energy sector, the prospect of radically expanding the sector is viewed very positively (Askja Energy, n.d.; Landsvirkjun, 2007; Orkuspárnefnd, 2013). However, this view is increasingly questioned and criticised. Þórhallsdóttir (interview) stated that “many Icelanders have an unrealistic valuation of our resources, especially those harnessed for energy generation.” Furthermore, people think these resources are “much more abundant than they are”. Estimates by authorities of exploitable hydropower of 30 TWh/yr with due consideration of environmental consequences (The Ministry of Industry, 1994) have particularly been under attack for being unrealistic (Einarsson, 2009; Magnason, 2007).

“If you look at the estimation of hydropower for energy generation then it’s often stated that we have 37-40 TWh/yr [...] and that’s a completely absurd number. [...] It’s sometimes added that this is the technically exploitable energy and some even say that this is what we can exploit after taking nature protection into consideration. On the other hand, if you calculate the energy that this water [that can be technically harnessed] can generate then you can get up to

20 TWh/yr, or a little bit more than that. You can't get up to 30 unless you mean to harness almost everything [all the glacial rivers]. And then you're also going to harness the water from practically every salmon-river in the country. [...]

The numbers that people are throwing out there, the ministers of industry, Landsvirkjun, the engineering firms, the President, they're way too high, they're completely unrealistic, and when you ask these people to explain on paper how they reach this number they can't do it." (Þórhallsdóttir, interview)

Obviously, estimates and perspectives of the most powerful actors in the energy sector are considered to be "unrealistic" by Þórhallsdóttir, who has been involved in the work on the Master Plan since 1999 (also, Gíslason, interview; Finnsson, interview; Guðbrandsson, interview).

With regards to geothermal energy, authorities have estimated up to 20 TWh/yr for electricity generation (The Ministry of Industry, 1994). This would represent a quadrupling of the current production of 5.2 TWh/yr. According to geochemist Stefán Arnórsson (interview), such estimates of geothermal energy are "impossible" because the production capacity of geothermal fields can only become quantifiable through a long-term experience with utilising the resource, which has to come about in many small steps (see also Arnórsson, 2012; Pálmason, 2005).<sup>32</sup>

Additionally, the work carried out under the Master Plan for hydro and geothermal energy in Iceland gives reason to doubt that Iceland has many options left for large-scale energy production (Rammaáætlun, 2011)(see also Einarsson, 2009). Yet, the government's will in this matter is clear. Árnadóttir, Minister of Industry, stated that Iceland has a great deal of untapped potential in terms of energy generation, adding that "we just have to reach some sort of reconciliation in society" (Árnadóttir, interview).

What does reconciliation denote in this context? Judging from the way the energy companies and the authorities frame it, and in view of their policies, reconciliation can only mean convincing those who oppose further energy development that this way forward is without alternative. On the surface, such aspirations appear democratic as there is no application of brute force as a way of silencing criticism. Rather, the strategy entails establishing "a widespread agreement over existing conditions and appropriate action" (Swyngedouw, 2010: 215), which has to a large degree been established in Iceland. This exemplifies how cultural hegemony works not only through coercion, but also consent.

Further, this marks the depoliticization of the discourse on energy and environment in Iceland by indicating that the struggles and disputes that inevitably arise given the fundamentally different

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<sup>32</sup> Furthermore, harnessing geothermal energy is essentially *mining* of heat and it is therefore impossible to make long-term estimates for energy production (Arnórsson, interview)(see also Arnórsson, 2012).

views on the expansion of the energy sector become obsolete in face of the abundance of the natural resources. This perceived abundance stands in stark contrast to the sense of scarcity the capitalistic logic dictates us to maintain. Not conquering this readily available El Dorado of energy resources thus becomes an act of carelessness if not irresponsibility.

### **5.3.3 Economic Perspective**

A study published in 2009 finds that investments in heavy-industry in Iceland yield much lower returns than other industries or 1,7% compared to 3,8% (Sjónarrönd, 2009).

In a report on the returns of Landsvirkjun's electricity sale to heavy-industry, it was found that the company's returns were not adequate after tax and inflation had been deduced (Á. Jónsson & Jóhannesson, 2012; "Stóriðja borgar fjórðung af því orkuverði sem heimili borga," 2010). Additionally, Landsvirkjun, e.g. in the case of Kárahnjúkar power project, bears a large part of the investment risk. This is because the already low electricity prices to Alcoa are also tied to the world market price of aluminium (Á. Jónsson & Jóhannesson, 2012). The current CEO of Landsvirkjun has stated that the returns of the Kárahnjúkar power project were unacceptable and the electricity price too low ("Arðsemi Kárahnjúkavirkjunar," 2011, "Of lítil arðsemi af virkjunum," 2011).

The electricity prices are so low that Icelandic tax-payers are in fact subsidising electricity for heavy industry, and some conclude that the sector has resulted in great financial losses for the nation, and not profits (Siglaugsson, 1999)(Þorláksson, 2009). Other studies indicate that the only net financial benefits from the heavy industry sector are taxes paid by the aluminium companies, altogether an equivalent of ca. 0.3% of GNP. The financial profits from harnessing Iceland's resources thus mostly ends up with the owners of the aluminium companies (Þorláksson, 2009).<sup>33</sup>

OR, the company that owns the geothermal plant in Hellisheiði, has also suffered financial losses since it began expanding its electricity production for heavy industry (Pétursdóttir, Ólafsdóttir, Kristmundsson, & Reynisson, 2012). OR had for decades been financially stable and yielded profits for its owners. In the early 2000s it began producing electricity for heavy industry and took high loans in foreign currency (Ibid.). These loans have multiplied since the economic crisis hit and OR's debts now stand at 216 billion ISK, or ca. 1.3 billion Euros (OR, 2013b).

It thus seems contradictory to argue for the expansion of the energy sector based on economic gains for the nation. Yet, when the energy sector fails to deliver its promises of prosperity, the green-

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<sup>33</sup> Other studies, e.g. (Harðarson, 1998), have shown economic benefits from heavy-industry. However, Harðarson, who wrote his report for Landsvirkjun, has been criticised for excluding factors from his methodology and accounting in order to yield specific results. See e.g. (Þorláksson, 2009).

energy narrative remains, by and large, intact. The concept of cultural hegemony can help explain this contradiction. One of Gramsci's insights is that the establishment of hegemony brings about the universalising of the interest and perspectives of a ruling-class. The green-energy narrative serves to legitimise its claims and actions and create a sense of common interests and unity of aims, namely that energy production benefits the whole nation. Icelanders have in many ways consented to this view, as is demonstrated for example by the fact that the two political parties who have been central in the creation and maintenance of the green-energy narrative have been in power for the most part since 1991. Maintaining the green-energy narrative in the face of evidence of broken promises is proof of its hegemonic status.

#### 5.4 Future Direction

*"There will never be enough energy"* (ES, interview)

A comprehensive assessment of the future development of the energy sector in Iceland is beyond the scope of this thesis. However, it is possible to draw some preliminary conclusions based on how actors within the green-energy narrative (the discourse-coalition) approach and interpret the Master Plan (see chapter 4.2.1), which represents the framework policy for environmental protection and resource utilisation in Iceland (Master Plan, n.d.)

According to the law 48/2011 on the Master Plan (Alþingi, 2011), *a process of declaring an area protected* shall begin as soon as Alþingi has legislated the Master Plan. UST is responsible for this process (UST, n.d.). The outcome of the second phase of the Master Plan was adopted by Alþingi on January 14, 2013 (RÚV, 2013a). A year later, the government announced budget cuts to UST and subsequently no money was assigned to the department responsible for declaring areas as protected, compared to 34 million ISK (ca. 2 million SEK) in 2013. Evidently, this was a stumbling block for the protection process.

On March 10, 2014, Orkustofnun sent a list to the Ministry of Environment with 91 potential power projects to be treated during the 3<sup>rd</sup> phase of the Master Plan (Orkustofnun, 2014b). Of these, 19 had been classified as protected in the 2<sup>nd</sup> phase.

This sparked a huge outcry within the environmental movement and among politicians in the government opposition, e.g. the former Minister of Environment Svandís Svavarsdóttir. She had claimed earlier that it violated the law on the Master Plan) to re-introduce power projects from the protection category to the next phase (Svavarsdóttir, 2013). Other politicians claimed Orkustofnun's proposal was "crazy" and a "political scandal" (RÚV, 2014i) and Landvernd's CEO Guðmundur I.

Guðbrandsson said the protection process had now been “castrated” (RÚV, 2014h) and that this was an attack on Icelandic nature (Guðbrandsson, interview). Many thus perceived Orkustofnun’s list as a licence for full exploitation of Iceland’s nature.

Orkustofnun’s director Guðni A. Jóhannesson responded that it was Orkustofnun’s legal duty to “look to the future” and to propose new projects, notably also those in the protection category that had *not yet* been declared protected (process has started, but not been signed). He further added that the laws on the Master Plan decreed this (RÚV, 2014g). The Minister of Industry agreed with Jóhannesson and Orkustofnun on this interpretation and claimed that it was “reasonable” to assume that future generations could re-evaluate the feasibility of the power projects in light of e.g. “new technology” and new methods of implementation (RÚV, 2014f).

The Master Plan had originally been framed as an attempt to establish a consensus between the interests of protection and of utilisation in Iceland. However, if the projects in the protection category will continuously be re-submitted every phase or every generation, while the projects that come into operation fall outside the scope of the Master Plan, then the balance between utilisation and protection is skewed.<sup>34</sup> This signifies only one thing: The debate on resource use in Iceland is reduced to *when* and *how* and not *if* Iceland’s rivers and geothermal fields will be harnessed.

The work on the Master Plan, or particular struggles in relation to it, clearly reveal growth’s cultural hegemony in environmental politics in Iceland. It demonstrates that progress is interpreted as growing the economy, and the project of modernisation as a continuing expansion of the energy sector without questioning the consumption of energy. The value of nature is becoming ever more evident in Iceland, but nature protection remains a dispensable sub-category to economic growth.

These trends raise serious questions regarding Iceland’s future. How many more rivers and geothermal fields will Icelanders sacrifice for the green-washing of aluminium companies? Will ‘wilderness’ only be preserved in isolated patches for tourism purposes and how will that affect Icelanders’ relationship with the land? What will happen, when climate change has eaten up the glaciers and, thereby, the glacial rivers?

The answers to these questions depend on whether our thirst for energy will ever be saturated or not.

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<sup>34</sup> In other words, the centre of the graph in Figure 6 (chapter 4.2.1) will gradually move towards the bottom left corner, thus distorting perceptions of acceptable negative impacts of energy development.

## 6. Discussion

My analysis of the discourse on energy and the environment in Iceland revealed the hegemonic status of a story-line I call the green-energy narrative. As became evident, this story-line is heavily influenced by EM. Its logic is translated into the continuous expansion of the energy sector at the cost of sensitive environmental areas.

### 6.1 Deconstructing the Story-line

In this section, I deconstruct the green-energy narrative, first by summarising the inherent contradictions that were identified in the analysis. Afterwards, it will be discussed with help of the critical concepts introduced above (chapter 3.4).

#### 6.1.1 Inherent Contradictions and False Promises of the Green-energy Narrative

##### *Economic Gains for the Nation*

The expansion of the energy sector in Iceland has always been justified with reference to economic gains for the nation. However, creating measurable profits for the nation has not been achieved in the expansion of the sector (chapter 5.3.3) and some of the energy companies have become a financial burden for Icelandic tax-payers.

##### *Rationality vs. Irrationality*

Actors within the green-energy narrative claim to be guided by rationality and accuse others of being irrational and sentimental (chapter 5.2.2). Yet, decisions are often founded on the suspension of rational thinking and a selective adoption of expert advice (chapter 5.2.1). What is more, it is hard to see how a logic that leads to overexploitation of resources, acts on speculation and risk-friendly decision making can be framed as rational. The polemic response to criticism (see poster campaign in chapter 5.2.2) furthermore underlines that the green-energy narrative avoids engaging with arguments in a rational manner. The persistence of the green-energy narrative illustrates the power of the discourse to influence thinking and decisions regardless of environmental degradation or loss.

##### *The GHG Paradox and Failed Responses*

Iceland seeks to reduce global concentrations of GHGs by radically increasing its emissions. This logic could only hold if the global CO<sub>2</sub> emissions decreased or increased less as a result of this. The Icelandic energy sector does not attempt to prove that this is the case – perhaps because of the

complexity of the issue. It can neither be proven nor disproven. As such, claims of abstract GHG reduction are essentially meaningless, but serve to green-wash a growth-seeking energy sector.

#### *Green Energy and Destruction of Environment: Local Impacts*

HGE in Iceland is described as green and environmentally friendly. However, the local consequences of energy production tell a different story (chapter 5.2). What becomes evident is an institutionalised acceptance of the severe environmental impacts renewable energy production can have.

#### *Tautology: Recognition of Green Becomes Justification*

The green label attached to the Icelandic energy sector is justified with a tautological argument. On the basis of lower GHG emissions from renewable energies, Iceland managed to have a special decision adopted into the Kyoto Protocol through diplomatic efforts, allowing the country to increase emissions from heavy-industry. Today, this international recognition is used as an argument to show how green the Icelandic energy sector is.

To conclude, these inherent contradictions of the green-energy narrative suggest a fundamental flaw in its internal logic and ability to produce results that live up to its own promises.

### **6.1.2 Theoretically Informed Criticism**

#### *Depoliticization*

As shown (chapter 5.2.1, 5.3.1 and 5.3.2), the green-energy narrative is largely depoliticized. As such, it prevents a democratic debate about the role of the energy sector and conceals the fact that there is fundamental disagreement among Icelanders on what to do with the country's natural resources.

The green-energy narrative's success derives partly from its flexible and multi-faceted character. It appropriates potentially critical discourses and views, e.g. the sustainability discourse and concerns over clashes between nature protection and energy generation, rather than openly opposing them. "We are all nature protectionists now", the Minister of Industry told me (Árnadóttir, interview). This colonisation of the concept of nature protection serves to make alternative views redundant.

I do not think this comment is meant to deceit or mislead. My experience from conducting interviews with the narrative-supporters revealed no harmful intentions. Rather, I see this as evidence of how convincing and attractive the green-energy narrative actually is. It is, in fact, a belief system (Christoff, 1996). Not only does it prevent us from questioning its assumptions, but it silences critical voices throughout society.

### *Carbon fetishism*

A decontextualized focus on CO<sub>2</sub> emissions has further led to a silencing of alternative responses to fighting climate change in Iceland, e.g. responses that aim at directly reducing Iceland's ecological footprint through addressing consumption rather than increasing it (Moolna, 2012; Swyngedouw, 2010). This, I argue, is a clear case of carbon fetishism, whereby renewable energy sources become good *per se* and trade-offs fall out of sight. Simultaneously, the dominant interests of the energy sector are further solidified and expansion becomes the only alternative.

Additionally, the green image of the energy sector has started acting as an absolution for Icelanders. We use it to justify our high levels of per-head energy consumption, we make no efforts to save energy although saving targets similar to the ones of the EU would result in energy gains equivalent to the production from an average power station in Iceland (Sveinsson, interview). Few nations own as many cars and drive as much per capita as Icelanders and food waste is excessive. To appease our conscience, we simply remind each other that our energy is green, that we are doing the world a favour, and all is well. This silences questions about the actual impact of our actions or the embodied emissions in the goods we consume.

I agree with Swyngedouw (Swyngedouw, 2013) that the current climate change consensus as operationalised through EM is radically reactionary. It strives for radical change – e.g. a carbon-neutral energy regime - but dares not to critically question the premises of the current energy regime. Its depoliticized character forecloses alternative views from gaining ground, e.g. in Iceland where ideas about deciding to stop damming and rather go for reducing energy consumption are publicly ridiculed and coined “regressive”. Meanwhile, the world's (and Iceland's) GHG emissions rise steadily and other environmental concerns remain marginalised.

### **6.2 EM and the Icelandic Case: Limits to Growth (on a finite island)**

What remains untouched and unquestioned in Icelandic energy and environmental policies is the capitalistic paradigm of growth. Orkustofnun, the government and other actors in the green-energy narrative are fully committed to a world where there will never be enough energy and where economic growth is the only real foundation for prosperity, which is demonstrated by their statements, actions and execution of policies.

Another influence of EM on energy policies in Iceland is the belief that ecology and the economy can be reconciled and that pressure on the environmental systems can be considerably lowered. In Iceland, this is translated into the perspective that nature protection and harnessing resources can

go together. The empirical evidence tells a different story: Ecosystems collapse, lakes are polluted, air pollution and chemicals cause respiratory problems, resources are depleted, landscapes lost. Yet, the energy is marketed as green and destruction is coined as the inevitable progress of modernity. In short, EM failed to keep its promise of reconciling environment and economy.

The case of the Icelandic energy sector demonstrates how the global problem of climate change gets translated through the lens of EM into local responses. These responses, as suggested by EM, are technological fix (as HGE in theory replaces carbon-based energy elsewhere) and growth, decoupled from resource use. Neither turns out to be successful in tackling the global problem they were designed for: There is no evidence that the alleged reduction in CO<sub>2</sub> emissions from aluminium manufacturing in Iceland is anything but redundant in the global context of GHG emissions.

Finally, the question of what to do when the last rivers and geothermal fields have been harnessed in Iceland does not surface because EM implies the omnipotent ability of technology to eliminate scarcity. It thus ignores the boundaries of the physical system it depends on. If Iceland's green energy system is a showcase for the rest of the world, as Icelandic authorities claim, then EM seems unable to create an economic system that stays within the planetary boundaries.

### **6.3 Growth's Cultural Hegemony**

I believe the green-energy narrative derives its dominance from its multi-faceted character and its ability to operate on all levels of social life and thought in Iceland. It provides us with the vocabulary to interpret economic, cultural and political issues, e.g. Iceland's rise from poverty to prosperity and independence, views on nature and resources and Iceland's role in a world fighting global environmental problems. It sets the norms and rules of society and defines what can be conceived as acceptable or logical actions. Thus it tells us that the appropriate response to a problem created by growth and consumption is *more* growth, *more* consumption; energy with a different face for the good of all.

This message is not fed to our intellect but our morals, which directs our attention away from the materiality of energy production. Thus, the question of how to treat nature and resources is elevated from the level of political struggles over the order of society, to a level of moral calling for all Icelanders. When conflicts arise nonetheless, e.g. regarding the Master Plan or Kárahnjúkavirkjun, the green-energy narrative responds not by engaging in a political debate but by undermining the validity of opposing claims (see chapter 5.2.1 and 5.2.2).

Why, in the face of its inherent contradictions and failed promises, does the green-energy narrative persist? The answer, to me, is simple: *Because we maintain it.* We are not ready to let go of its promises quite yet, and willingly consent to its worldview. This is partly because cultural hegemony conceals certain conflicts. In Iceland, the question of intra-generational distribution of benefits from energy expansion goes largely unaddressed in debates on energy and nature. And, similarly, who is it really that profits?

## 7. Conclusion

In this thesis, I have analysed the discourse on energy in Iceland and revealed the hegemonic status of a story-line I call the green-energy narrative. I have studied the normative commitments underlying this story-line and shown that it is heavily influenced by EM. Furthermore, my analysis shows how the story-line is reproduced in policies, actions and debates on energy in Iceland and that it drives the material expansion of the energy sector.

My contribution lies mainly in two areas. First of all, I have contributed to a better understanding of the power relations and implicit assumptions that drive the expansion of the energy sector in Iceland. Secondly, I have demonstrated that there is a need to critically study how transformations towards renewable energy take place elsewhere and that environmental concerns that do not evolve around CO<sub>2</sub> need to be put on the agenda if we are to address sustainability.

The case of Iceland underlines the importance of approaching sustainability from an integrated perspective. A focus on one aspect, such as CO<sub>2</sub> emissions, can blind us to other problems that equally merit consideration. Discourse is powerful in creating this blindness and allowing unsustainable practices to be pushed through under the guise of greening, in this case the greening of energy production.

My implicit objective in this thesis was to better understand environmental politics in Iceland with the hope of locating potential entry-points for change. What I have found is this: Environmental politics and debates on energy in Iceland cannot be reduced to argumentative struggles, as Hajer would have it. Argumentative struggles rely on the condition that actors engage in argument with each other, and there must be a content that can be argued either for or against. Neither applies to the green-energy narrative, whose actors evade political conflicts and fail to recognise the normative and often contradictory foundation of their worldview.

I thus do not believe alternative views will gain prominence – neither in Iceland nor elsewhere – simply by winning the argument. Rather, a fight for an alternative reality, one that is sensitive to physical limits, must take place on all the levels where hegemony functions and is reproduced – in all areas of social life, in our thoughts, norms and beliefs.

A change is needed, for there is much to lose from continuing the status-quo, and much to gain from breaking with it. For Iceland, this is a question of putting all its wilderness to energy development or not. For the world, this involves either success or failure in remaining within the delicate balance of planetary boundaries.

## **7.1 Further Research Orientations**

I have indirectly offered insights on Icelandic politics, although my focus was not on political culture. Further research on energy development in Iceland in relation to the country's political culture would be enlightening.

I have also dealt indirectly with questions of inter-generational justice by looking into preservation of nature for future generations. However, I did not engage in a discussion about intra-generational justice as I did not in any depth investigate how financial benefits from the expansion of the energy sector are distributed. These issues are important and more research could be interesting.

Iceland's energy-landscape might be changing: The selling of green certificates to EU member states is expected to grow in the next years, there are plans to build a deep-sea cable to the UK to connect Iceland to other energy grids, and, finally, Icelanders are embarking on oil drilling off the coast of northeast Iceland. All these issues could have contradictory impacts on the Icelandic energy system and nature and would be interesting research topics for the future.

Finally, more research on marginalised environmental consequences is needed in other countries or areas where a 'successful' transformation has been made to renewable energy.

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## **Appendix I**

This questionnaire was carried out in Reykjavík, Iceland, on March 6th and 7th 2014. I randomly approached potential participants in public spaces, i.e. coffee shops and book shops. I did not attempt an in-depth analysis of the data, e.g. by accounting for gender, age or occupation. This might have been interesting with a bigger sample. The questionnaire results are only meant as supportive data in my thesis. See outcome from question 21 in the wordcloud in chapter 5.3.1 in my thesis.

## Questionnaire: Data Collection for a Master's Thesis

This questionnaire is carried out as a part of data collection for a master thesis in Environmental Studies and Sustainability Science at Lund University, Sweden. The main focus of the project is energy production in Iceland and prevailing views among Icelanders on energy and nature.

As a valuable addition to other data, the results of this questionnaire will form the basis of the analysis in my thesis, although the results will not be traceable to any one participant. However, if you are interested in the topic and/or want to know more, you are welcome to leave your e-mail below and I will contact you when the thesis has been made accessible online on Lund University's website. You can also contact me at [hronn.boa@gmail.com](mailto:hronn.boa@gmail.com) should any questions concerning this questionnaire arise.

**Thank you for participating!**

### Background information

Age  <18  18-34  34-50  51-64  65+

Gender  Female  Male  Other

Occupation \_\_\_\_\_

E-mail \_\_\_\_\_

*Please fill out the form below by indicating what describes your own opinion the best.*

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>1</b>	In general, Icelanders are aware of environmental issues and nature conservation.	<input type="checkbox"/>				
<b>2</b>	Icelandic nature is characterised by unspoilt and undeveloped wilderness.	<input type="checkbox"/>				
<b>3</b>	Hydro and geothermal energy are renewable and environmentally sound energy sources.	<input type="checkbox"/>				
<b>4</b>	There is a big untapped potential for new power generation projects in Iceland.	<input type="checkbox"/>				
<b>5</b>	It is necessary to sustain economic growth to ensure prosperity in Iceland.	<input type="checkbox"/>				

<b>6</b>	Icelandic authorities prioritise sustainable use of resources and nature conservation.	<input type="checkbox"/>				
<b>7</b>	Iceland is at the forefront of environmental issues in the world.	<input type="checkbox"/>				
<b>8</b>	Energy production in Iceland is sustainable.	<input type="checkbox"/>				
<b>9</b>	It is justifiable to harness more energy in the highlands if the economic benefits of doing so are high.	<input type="checkbox"/>				
<b>10</b>	Energy production from hydro and geothermal energy does not harm Icelandic nature.	<input type="checkbox"/>				
<b>11</b>	Nature conservation/protection? and the utilisation of land for energy generation go together in Iceland.	<input type="checkbox"/>				
<b>12</b>	The Icelandic highlands have an important status in the country's history and the nation's identity.	<input type="checkbox"/>				
<b>13</b>	Iceland's use of hydro and geothermal energy contributes to global reduction of GHGs.	<input type="checkbox"/>				
<b>14</b>	It is necessary to start new power generation projects to ensure quality of life in Iceland.	<input type="checkbox"/>				
<b>15</b>	Outside of Iceland, the country has an image of unspoilt wilderness and magnificent nature.	<input type="checkbox"/>				
<b>16</b>	Future generations have the same rights to experience Icelandic nature and wilderness as previous generations.	<input type="checkbox"/>				
<b>17</b>	Climate change threatens Iceland's prosperity.	<input type="checkbox"/>				
<b>18</b>	All Icelanders profit from the harnessing of natural resources for power generation.	<input type="checkbox"/>				
<b>19</b>	In general, Icelanders are well informed about the environmental issues of resource utilisation.	<input type="checkbox"/>				

**20** I am well informed about the environmental issues of resource utilisation.

**21** What characterises Icelandic nature?  
Please write 2-3 words.

## Questionnaire Results

QQ	SD (%)	D (%)	N (%)	A (%)	SA (%)	Total
1	2 (6)	11 (32,5)	4 (12)	17 (50)	0 (0)	34
2	1 (3)	0 (0)	5 (14,5)	25 (73,5)	3 (9)	34
3	1 (3)	3 (9)	6 (17)	17 (50)	7 (20,5)	34
4	2 (6)	8 (23,5)	8 (23,5)	12 (35,5)	4 (12)	34
5	0 (0)	3 (9)	7 (21)	16 (48,5)	7 (21)	33
6	10 (29,5)	12 (35,5)	8 (23,5)	3 (9)	1 (3)	34
7	5 (20,5)	11 (32,5)	10 (29,5)	7 (20,5)	1 (3)	34
8	3 (23,5)	4 (12)	8 (23,5)	17 (50)	2 (6)	34
9	12 (34,5)	9 (26,5)	3 (9)	7 (20,5)	3 (9)	34
10	9 (27,5)	14 (42,5)	4 (12)	3 (9)	3 (9)	33
11	3 (9)	14 (41)	10 (29,5)	3 (9)	3 (9)	34
12	0 (0)	0 (0)	3 (9)	16 (47)	15 (44)	34
13	1 (3)	7 (22)	11 (34,5)	11 (34,5)	4 (12,5)	32
14	12 (35,5)	12 (35,5)	4 (12)	4 (12)	2 (6)	34
15	0 (44)	1 (3)	4 (12)	19 (56)	10 (29,5)	34
16	0 (0)	0 (0)	1 (3)	12 (35,5)	21 (62)	34
17	1 (3)	2 (6)	8 (23,5)	14 (41)	9 (26,5)	34
18	4 (12)	4 (12)	11 (32,5)	10 (29,5)	5 (14,5)	34
19	5 (14,5)	16 (47)	7 (20,5)	5 (14,5)	1 (3)	34
20	1 (3)	2 (6)	15 (44)	9 (26,5)	7 (20,5)	34

## Appendix II

As indicated below, interviews were conducted in Reykjavík and Borgarnes, Iceland, from February 24 to March 11.

The interview guide changed slightly from one interview to the other, as I conducted semi-structured and open-ended interviews. However, these key themes were discussed to some extent in all interviews.

### Interview Guide and overview of interviews

**Key Q1: What is the general attitude in Iceland towards the country's resources (hydro and geothermal)?**

- What characterises energy production in Iceland? How would you describe it?
- *If interviewees use the terms sustainable, renewable, green, clean, environmentally friendly, ask them to explain in more detail what they mean.*

**Key Q2: What were the main historic drivers behind the development of the sector and what are the main drivers today?**

- Are there any specific economic factors that played in?
- Are there any specific political and/or cultural/historical factors?

**Key Q3: Has this development been a success story? Have we been successful?**

- Do we use the energy responsibly/well?
- Is the energy still 'green' if is used to produce materials/metals that are not used sustainably?

**Key Q4: What characterises energy politics and policies in Iceland?**

- Where would you situate Iceland with respect to other countries in terms of sustainability and environmental protection? (I rarely posed this question, I sort of forgot it. Though I think most of my interviewees discussed this a bit).

**Key Q5: What is the general attitude towards/view on nature in Iceland?**

- How do Icelanders view the highlands?

**Key Q6: To your mind, can energy extraction and protection go together? Why/why not?**

- Does it go together in the highlands?

**Key Q7: Are there any conflicts in Iceland on HGE projects?**

- What trade-offs are brought up in the debate?
- How would you characterise opposing views?
- Are there any specific cases of conflicts that have been defining in some way for energy production and/or the environmental movement?
- How do you view Rammaáætlun (the Master Plan) – is it an attempt to reconcile opposing views?

**Key Q8: How do you perceive the future development of the Icelandic energy sector?**

- Will there ever be *enough* energy produced?
- What is it that really makes a society or its energy use sustainable?
- What are we striving for (by harnessing HGE)? What sort of future are we trying to establish for Iceland – for the world?

## Interview Overview

		Location	Date	Organization	Position	Time	
1	Árni Finnsson	Reykjavík	27 February	Iceland Nature Conservation Association <sup>35</sup>	President	60 min	In person
2	Guðmundur Ingi Guðbrandsson	Reykjavík	4 March	The Icelandic Environment Association <sup>36</sup>	CEO	50 min	In person
3	Þorbjörg Sandra Bakke	Reykjavík	24 February	Grugg – Environmental Network	Active member	60 min	In person
4	Guðni A. Jóhannesson	Reykjavík	28 February	National Energy Authority <sup>37</sup>	General Director	35 min	In person
5	Kristinn Einarsson	Reykjavík	28 February	National Energy Authority	Senior Manager	45 min	In person
6	Ragnheiður Ólafsdóttir	Reykjavík	3 March	National Power Company of Iceland <sup>38</sup>	Environmental Manager	70 min	In person
7	Óli Grétar B. Sveinsson	Reykjavík	5 March	National Power Company of Iceland	Executive Vice President	60 min	In person

<sup>35</sup> Náttúruverndarsamtök Íslands. <http://natturuvernd.is/English>.

<sup>36</sup> Landvernd. <http://landvernd.is/en>.

<sup>37</sup> Orkustofnun. Government agency under the ministry of industry. <http://www.nea.is/the-national-energy-authority/>.

<sup>38</sup> Landsvirkjun. 100% state run, main electricity provider in Iceland (over 70% share). <http://www.landsvirkjun.com/>.

8	Kjartan Sigurjónsson	Reykjavík	27 February	Landsnet <sup>39</sup>	Transmission System Operator	60 min	On the phone
9	Ragnheiður Elín Árnadóttir & Helga Barðadóttir	Reykjavík	4 March	Ministry of Industry and Commerce <sup>40</sup>	Minister of Industry and Commerce (REÁ) & Senior Expert, Energy Affairs (HB)	30 min	In person
10	ES	Reykjavík	7 March	Ministry of Industry and Commerce. Dep. of Ind. and Energy	Senior Advisor. Energy Markets & Infrastructure	45 min	In person
11	JG	Reykjavík	11 March	Ministry of Environment. Dep. of Land and Nat. Heritage	Director General/specialist in env. resource management	30 min	In person
12	Ketill Sigurjónsson	Reykjavík	3 March	Askja Energy <sup>41</sup>	Managing partner	60 min	In person
13	Svandís Svavarsdóttir	Reykjavík	7 March	Left-Green Party. Icelandic Parliament.	Previous Minister of Environment and Natural Resources (2009-2013). MP	60 min	In person
14	Stefán Gíslason	Borgarnes	5 March	The Master Plan for Hydro and Geothermal Energy	Head of the steering committee of the Master Plan, 3 <sup>rd</sup> phase. <sup>42</sup>	120 min	In person

<sup>39</sup> Landsnet operates Iceland's electricity transmission system. <http://www.landsnet.is/english>.

<sup>40</sup> Falls under the Ministry of Industries and Innovation

<sup>41</sup> Icelandic energy consulting firm. <http://askjaenergy.org/about/askja-energy-partners/>.

<sup>42</sup> Rammaáætlun: the Icelandic Master Plan for Hydro and Geothermal Energy Resources. <http://www.rammaaetlun.is/english>.

<b>15</b>	Póra Ellen Þórhallsdóttir	Reykjavík	25 February	University of Iceland & Master Plan	Expert on the steering committee of the Master Plan	60 min	In person
<b>16</b>	Guðmundur Hálfson	Reykjavík	26 February	University of Iceland	Historian	60 min	In person
<b>17</b>	Stefán Arnórsson	Reykjavík	4 March	University of Iceland	Geochemist <sup>43</sup>	90 min	In person

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<sup>43</sup> Stefán has also been involved with the Master Plan and is on the board of Landsvirkjun.

## Appendix III

### Argumentative Discourse Analysis

I will apply the argumentative approach to discourse analysis (ADA) developed by Hajer (1995) for my analysis of the discourse on energy in Iceland. A basic tenet of ADA is that discourse is constitutive of reality and, as a consequence, environmental conflicts are not just conflicts over what action should be taken, but conflicts “over the meaning of physical and social phenomena” (Hajer, 1995: 72).

Hajer builds his approach on a transformational model of social reality in which society is reproduced through interaction between agents and structures. Interaction, to a great extent, takes place through discourse, in which language has a central role. Hajer, following Foucault, does not interpret language or discourse as a mere set of tools, but “a specific communicative practice which influences the perception of interest and preferences” (1995: 59). It follows that interests are not given, but “intersubjectively constitutive through discourse” (Ibid.: 59), so the use of language can actually create new meanings and alter people’s cognition and identities.

In light of this, Hajer directs ADA towards analysis of discursive interaction and discursive practices and argues that the power structures of society should be studied through discourse (1995: 55). In order to do so, and to explain how discourse is reflected in/relates to action, Hajer introduces two analytical concepts, or middle-range concepts as he calls them (they show how discursive orders are maintained and transformed). The first one is the concept of *story-line*.

*Story-lines* are narratives on social reality that act as points of reference and allude to a common understanding of a phenomenon, e.g. environmental problems. Hajer defines them as “a generative sort of narrative that allows actors to draw upon various discursive categories to give meaning to specific physical or social phenomena” (p. 56) and claims that in terms of analysis, story-lines help make sense of how discursive domination is established. His assumption is that political power of a discourse does not depend on the consistency of the story-line but rather its multi-interpretability, meaning that it can be adopted by various actors who have different world-views and might otherwise disagree on the details.

For Hajer, story-lines are powerful political devices and the key-element in ADA. They function as metaphors in debates; they cluster knowledge and position actors and they reduce the complexity of topics so that it becomes intelligible to a broad audience. As they gain acceptance, “they gain a ritual

character” (1995: 63) and provide different people, e.g. the activist, the politician or the scientist, with a narrative that “sounds right” and makes the puzzles fall together.

The second middle-range concept is *discourse-coalition*. Hajer defines them as an ensemble of a story-line, the actors who use it and the practices in which this takes place. In other words, discourse-coalitions form around story-lines, specifically if the story-line has bearings in terms of policies and political projects. Discourse-coalitions do not unite around interests or ideologies, but story-lines – this suggests looking for politics in new places.

A central theme of ADA is that Hajer views politics as a struggle for discursive hegemony, where hegemony constitutes securing support for and acceptance of a particular definition of reality (conveyed through story-line). He sees discursive hegemony as reached under two conditions, *discourse structuration* and *discourse institutionalisation*, which in turn rely on three criteria. Thus, a specific definition of reality has to be *credible* so that actors have faith in/believe in it, *acceptability* requires that the position appears necessary and attractive, and the account must be *trustworthy* enough so that any doubts or uncertainties remain suppressed.

Furthermore, once a story-line has gained enough support from a varied discourse coalition, it can start generating political effects (Hajer, 1995: 12-13).