ICELAND OCEAN CLUSTER

ICELAND'S OCEAN ECONOMY

THE ECONOMIC IMPACT AND PERFORMANCE OF THE OCEAN CLUSTER IN 2011

INTRODUCTION

Despite Icelandic fisheries having evolved from traditional fishing and fish processing into a business sector consisting of a variety of fields such as technology, logistics, marketing and more, there has been a lack of an overall picture of these activities, hereby called "ocean cluster". This shortage of information about this cluster has hampered discussions on its impacts and abilities. The public debate most often implies that the number of jobs created by fisheries are declining. However this debate only focuses at fisheries and fish processing, important foundations of the cluster, but far from its only activities. At the same time, it is assumed that fisheries will become less important for the economy in the years to come, as increasingly less manpower is needed for fishing and fish processing.

Research has shown that the traditional fisheries sector is a base industry in Iceland (Arnason & Agnarsson). This means, among other things, that its contribution to gross domestic product is greater than national accounts indicate. On the foundations of the traditional fisheries industry, a collection of sectors and firms has formed, meeting the fisheries' needs. This collection of sectors as such has been named the ocean cluster. Studies show that a large part of the total contribution of the fishing sector to GDP comes from the operations of the ocean cluster.

About the Iceland Ocean Cluster

The Iceland Ocean Cluster began its existence as a research project in the University of Iceland in the spring of 2010. The goal of the I.O.C. is to increase the value of the companies operating in the cluster. Partners include leading firms within the ocean cluster, but by building and maintaining networks the IOC creates new opportunities for cooperation and innovation. At any given time the I.O.C. team is working on various project based on cluster ideology. Major projects in 2012 include establishing an advanced processing cluster in Reykjanes, joint marketing of tech firms and increasing service to foreign vessels in Iceland.

In their paper, "The Importance of the Ocean Cluster for the Icelandic Economy" (2012), Ragnar Arnason and Thor Sigfusson attempted to analyze the nature and scope of the ocean cluster, evaluate its future growth potentials and describe the conditions needed in order for the cluster to grow. The aim of this report is to continue that work and get a picture of the ocean cluster's development over time. By continuing this research it is possible to compare performance between years and further examine the cluster's growth potentials and the conditions that must be in place to utilize these potentials. In doing so, the contribution of the ocean cluster to the economy can further be increased.

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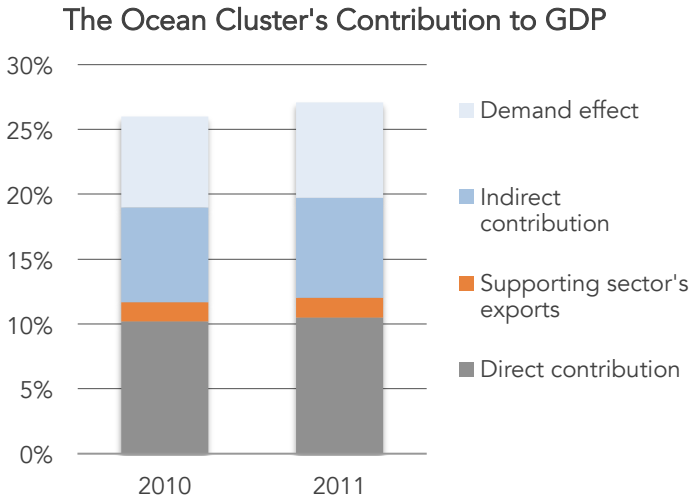
EXECUTIVE SUMMARY

The results of the analysis presented here provide a general picture of the impact that the ocean cluster in Iceland is expected to have on the Icelandic economy as a whole in 2011.

The results indicate that the contribution of fisheries and related sectors in the ocean cluster, in the form of a direct and indirect contribution, demand effect and the contribution of independent exporters, was 27.1% of GDP, compared to 26% in 2010.

Employment in the ocean cluster is expected to have grown by at least 3-5%. This increase is due to more jobs being created in fishing and fish processing, technology firms and various other fields related to the fishing industry. Conversations with a number of fishing companies reveal that many intend to cut down and reduce staff in order to meet increased taxation. Overall, this staff reduction did not take place in 2011, but is likely to have an impact in 2012 and 2013.



Interestingly, turnover in many of the cluster's sectors has grown considerably in proportion to employment, indicating increased productivity. Management consulting firm McKinsey & Company argued in a recent report on the Icelandic economy that the fishing industry is the sector that has managed to increase the level of productivity the most in recent years. This trend seems to continue in 2011.

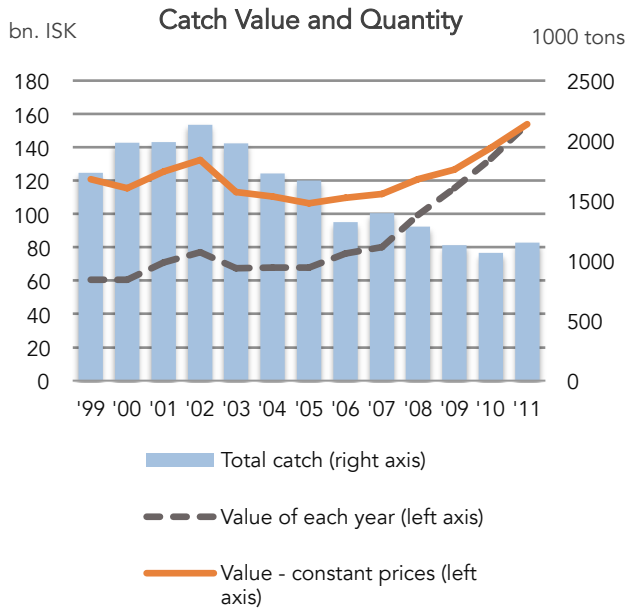
Technology firms in the ocean cluster appear to have realized the most growth, as turnover increased by around 15% in 2010 to 2011. There are also indications of an estimated 10-15% growth in advanced marine processing and biotechnology, but this growth can be expected to rise in the coming years given the plans that many these firms hold.

Increased turnover in fisheries had a positive impact on nearly all related sectors in retail, service and industry.

Overall, 2011 was a good year for the Icelandic ocean cluster with increased profitability in most areas. However, warning signs are present with increased taxation and uncertainties in international markets. Further growth and productivity increase in the ocean cluster depends on stability in its operating environment and the depletion of uncertainties regarding fisheries management.

FISHERIES IN 2011 AND CONTRIBUTION TO GDP

The total catch of Icelandic vessels in 2011 was 1,150 thousand tons, an increase of 8% since 2010. Total catch value was 154 billion ISK, an increase of 16% between years. Although total catch has been declining (in the long term), total catch value, at constant prices, has been steadily rising for the past years. This can mostly be attributed to rising international seafood prices and the weakening of the Icelandic Krona.



According to Statistics Iceland, direct jobs in the fishing sector were around 9,000 total (approx. 5% of Iceland's workforce) in 2011, having increased by 5% since 2010. As mentioned before, these numbers are not as informative as before, as many of the fisheries' activities do not take place within the companies themselves anymore, but are outsourced to independent service companies. Activities such as landing, various repairs etc. are carried out by the service companies but are not considered part of the fishing industry. In fact, previous studies have shown that the ocean cluster creates, directly and indirectly, 25-35 thousand jobs which is 15-20% of Iceland's workforce. In addition to an increase of 500 jobs in fisheries, conversations with service companies revealed that these firms added at least 100 jobs in 2011. This increase in direct jobs doubtlessly leads to an increase in derived employment. A careful estimation in accordance with previous research hints that employment in the ocean cluster increased by at least 3 to 5% in 2011.

In this report, we will attempt to evaluate the economic importance of the Icelandic ocean cluster in 2011. In order to do so, we will base our calculations on the IOC's research on the same topic in 2010 and update the estimate for 2011. The methodology involved is based on the assumption that the fishing industry is a base industry in Iceland. The economic impact of base industries can be divided into three categories:

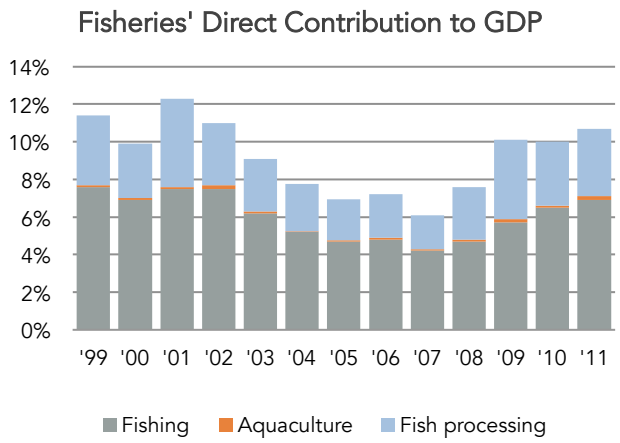
i. Direct contribution: The value added in the fishing industry itself
ii. Indirect contribution: The value added in the industries that supply the fishing industry with resources or further process the fishing industries products
iii. Demand effect: The value added in sectors that provide the employees of the fishing industry and related industries with goods and services

On this basis, the intention is to assess the overall share of these factors in gross domestic product. Numerical data on the direct contribution of fisheries to GDP is officially available from Statistics Iceland. There are quite more complications involved in evaluating the indirect contribution and demand effect, but various methods have been used to do so.

Direct Contribution

The direct contribution of fisheries to GDP is the value added in fisheries in the form of wages and profits, but this data is compiled by Statistics Iceland. These statistics show that the combined share of fishing, aquaculture and fish processing declined steeply in the years before the economic collapse in 2008. Since then, this ratio has risen, but in 2011 the direct contribution of fishing and fish processing was 10,5%, a 5% increase since 2010. It should however be noted that Statistics Iceland still marks these figures as preliminary, meaning that they could change slightly when confirmed.[1]

[1] This was in fact the case with data on the direct contribution of fisheries in 2010. In the Iceland Ocean Cluster's report on the imortance of the ocean cluster for the Icelandic economy in 2010, the direct contribution to GDP was estimated at 10.2%. After being confirmed by Statistics Iceland, these numbers dropped to 9.9%.



Indirect Contribution

The indirect contribution of the fisheries industry is the value added in the sectors that provide the fishing industry with resources or further process its products. The assumption of this indirect contribution is based on the premise that the business dealings between fisheries and other sectors increases the value added in these sectors, for example due to increased production. The indirect contribution is not calculated by Statistics Iceland. It can however be estimated as the multiple of the value added in these related sectors and the share in their total turnover attributed to trade with the fishing industry. A prerequisite for this evaluation is that the value added in business dealings with the fisheries is on average equal to the value added in business with other sectors.

In the IOC's analysis of the economic importance of the ocean cluster in 2010, extensive data acquisition work was carried out where a range of large and small companies in the fisheries sector were contacted. Detailed information was obtained on all purchases made by these companies from other companies which may be considered within the ocean cluster in Iceland. These companies were then classified according to the industrial classification system used by Statistics Iceland (ÍSAT 95). Consequently, over 100 companies in the corresponding categories were contacted and information obtained on their turnover, human resources use and scope of operation in general. On this basis it was possible to estimate the total turnover in these sectors and thereby the share of their turnover that can be traced to business dealings with the traditional fisheries sector.

In this analysis of the economic importance of the ocean cluster in 2011, the results of the 2010 analysis were applied to Statistics Iceland's data on value added in the sectors in 2011. It was not considered necessary to update the analysis as a whole, as it is safe to assume that the proportion of turnover traced to the fishing industry in related sectors generally does not change significantly from year to year.

Table 1 demonstrates the proportion of fisheries in the total turnover of business sectors. This proportion is highest, 50%, in the textile industry, as it includes fishing net manufacture and various other fishing gear manufacture. It is also high in public governance and the activities of membership organizations. Metal manufacture and repair is an important part of maintenance of fishing vessels and processing plants, as approximately 30% of turnover in this sector can be traced to business relations with the fisheries sector. It should be noted that the fisheries' proportion of

turnover in the transport industry is very likely underrated, as buyers of seafood products, agents and others often manage transport. According to information from the largest transport companies, roughly a third of their turnover can be traced to fisheries. The manufacture of other vehicles covers boat building and repairs, in wood manufacturing, fisheries are a large buyer of packaging made from wood fibers and commission trading (not including vehicles and motorcycles) covers imports and sales of fishing gear, machines, tools, clothing and packaging.

TABLE 1. ASESSMENT OF THE FISHERIES' SHARE IN THE TURNOVER OF INDUSTRIES

NAME	SHARE IN TOTAL TURNOVER
Manufacture of textiles	49,59%
Public governance; excl. social insurance	35,77%
Activities of membership organizations	34,54%
Metal manufacture and repair	29,73%
Transport and agency services	20,97%
Manufacture of other transport equipment	16,29%
Manufacture of wood	13,34%
Manufacture of machinery and equipment	12,04%
Land transport	7,76%
Water transport	7,30%
Commission trading without vehicles	5,64%
Manufacture of rubber and plastic goods	3,39%
Research and development	2,96%
Real estate activites	2,38%
Chemical industry	2,07%
Other business activities	1,84%
Electricity, gas steam and hot water supply	1,35%
Post and telecommunications	1,02%
Car sales and maintainance; fuel sales	1,02%
Computer and related activites	0,92%

When the results of this analysis has been applied to Statistics Iceland's figures on the contribution of individual sectors to GDP, the indirect contribution of the fisheries sector is estimated to have been 7.7% in 2011. This increase is in tandem with the increase in direct contribution from 9.9 to 10.5% between 2010 and 2011. Therefore, the direct and indirect contribution to GDP is estimated to have been 18.4% in 2011 compared to 17.5% in 2010.

Demand Effect

In addition to the direct and indirect contribution of the fisheries sector to GDP, it can be assumed that the added value created directly and indirectly, and which appears in the form of wages and profits, will be used to purchase consumer goods and services. Thereby the sector has an even greater impact on the Icelandic economy. These effects are called multiplier effects or demand effects and are quite complicated to evaluate in a precise manner. Independent research on the scope of these effects in Iceland has not been carried out yet. Studies on the economic impact of fisheries in Canada suggest that these effects can be nearly as high as the indirect contribution of fisheries in provinces where fisheries are highly important (Pinfold, 2009). It is likely that the demand effect is somewhere between 50 and 100% of the direct and indirect contribution. This is consistent with other studies (Agnarsson & Arnarson; GSGislason; KPMG 2010). In the IOC's research on 2010, it was decided to be somewhat below the lower limits of the above range and consider the demand effect to be 40% of the direct and indirect added value of the fisheries sector. Assuming that this added value was 18.4% of GDP, the demand effect was approximately 7.7% of GDP in 2011.

The Independent Contribution of Supporting Sectors

The following chapter describes the many different sectors that have formed around the fisheries industry and have started to carry out various independent exporting activities. The turnover in the independent exports of these supporting sectors was estimated at 42 billion ISK in 2010. This turnover was carefully assumed to have been around 1.5% of the direct and indirect added value of the fisheries sector. As precise data on the turnover in these independent export activities in 2011 is not available, it was not considered reasonable to increase this assessment between years. However, there are various indications that there has been a substantial increase in this turnover, particularly within the technology sector.

THE OCEAN CLUSTER

The existence of the Icelandic ocean cluster and the economic abilities it possesses offer considerable opportunities for continued growth and thereby a further increase in its contribution to GDP. There are many international examples of base industries, comparable to the Icelandic fishing industry, that have generated connected business sectors that then have grown to be even more economically important than the base industry itself (Porter, 1990). In fact, there are do not seem to be any obstacles for the Icelandic ocean cluster to evolve in the same way. The economic benefits of such a development are clearly substantial.

The largest sectors that have evolved around the fisheries sector and achieved an independent status in the global market are sales and marketing, shipping/haulage, advanced marine processing and the technology sector.

Technology firms growing

Our studies show that exports and turnover of the technology firms within the ocean cluster were strong in 2011. The roughly 65 firms exported technological equipment related goods for around 16 billion ISK in 2010, but the estimated exports in 2011 are around 20 bn. ISK. The domestic market seems to have realized some stagnation. Estimated domestic sales in 2010 were about 11 bn. ISK and remained largely unchanged.

It should be noted here that the two largest tech firms in the ocean cluster, Marel and Hampidjan operate in large part abroad. The turnover of these firms (related to the fisheries sector) including foreign subsidiaries was 12.8 bn. ISK in 2011. There is no available information on how much of this turnover occurs in Iceland but it is estimated to be roughly one third.

Exports of technological equipment for fishing and processing have grown substantially, particularly in vessel equipment such as energy saving equipment and various software products. Exports of vessel equipment are estimated to have been 2.5 bn. ISK in 2011, an increase from 1.6 bn in 2010. Exports of technological equipment for fish processing is estimated at around 8 bn ISK, a 30% increase sine 2010.

Most sections of the ocean technology sector appear to be expanding their exports including processing equipment, software, cooling technology and green technology. Tech firms manufacturing containers, packaging and fishing gear are assuming less growth, or anywhere from 5 to 10%. Various consulting firms did see increased turnover as well, but no comprehensive data is available on that section.

The larger tech firms within the ocean cluster are responsible for most of the export growth in 2011. Among these are Marel, Hampidjan, Hédinn, Promens, Marorka, Vaki, Skaginn, Frost and 3X. These firms have more room for international marketing than smaller companies. This fact supports the importance of further convergence taking place in the ocean technology sector, creating more capacity for international sales and marketing.

Overall, it is estimated that the turnover of technology firms in the ocean cluster was just over 30 billion ISK in 2011 with a 15% increase since 2010. Including the total turnover of Marel and Hampidjan this turnover was about 40 bn. ISK in 2011.

Employment growth in technology companies was 3-4% in 2011. The workforce in the ocean technology firms in Iceland consists of roughly 1000 people, most of whom are technologically trained.

Transport service strengthening

Icelandic transport companies have utilized their knowledge in transporting seafood products to strengthen their competitive position in international markets for marine product transport. At the same time, their specialization in transporting frozen and fresh fish has been a source of growth. The total increase in marine shipping volume was around 4-5% in 2011.

The two largest transport companies, Eimskip and Samskip realized a turnover of about 140 bn. ISK in 2011, an increase of 5% since 2010. The companies' combined operating profits amounted to 4.5 bn, a slight increase between years.

Samskip invested in two new vessels and Eimskip invested in three reefer ships intended to serve the Norwegian market and began contraction on two new container ships, scheduled for delivery in 2013.

Icelandair Cargo saw a turnover of roughly 10 bn. ISK in 2011, out of which 40% is estimated to be due to

seafood transport. Total income has remained unchanged as the company cut down on air charter in international markets. However, turnover in cargo increased by around 10% between 2010 and 2011.

Sales and marketing in turmoil

Sales and marketing has been an important part of the Icelandic fisheries industry. The knowledge that has built up has been used to serve other markets with processing, purchase and sales of fish.

The two large sales companies, Icelandic Group and Iceland Seafood International had a combined turnover of 111.6 bn. ISK in 2011 and profits of 10.6 bn. The lion's share of the profits came from Icelandic's sales of foreign assets.

2011 was an eventful year for the sales and marketing sector. Icelandic Group sold factories in France, Germany and the U.S as well as China. The firm still owns processing plants in Britain that mostly produce for consumer markets, processing and service operations in Iceland as well as sales and marketing offices in Britain, Norway, Spain and Japan. In addition to the large sales companies, a number of small and medium firms operate in seafood sales and marketing. No accessible data exists on the turnover nor earnings of these firms in 2011.

Advanced processing and biotechnolgy moving up

A number of small but dynamic companies have formed that process rest raw materials from traditional fish processing. These firms manufacture liver products, dried fish, fish oil, fish leather, enzymes, flavorings, cosmetics and more. In terms of size, Lýsi is the biggest player with an income of 6 bn. ISK in 2011. After that come the large drying plants like Haustak that realized a 3 bn. turnover in 2011.

2011 was a good year for most of the companies that were contacted. The bigger companies increased turnover and recruited new employees in fish oil production, liver processing and fish drying. In some cases the growth was up to 20% while staffing increase was far smaller, or 2-5%.

The Iceland Ocean Cluster has been keeping a list of every company involved in any kind of advanced marine processing. This list his extremely diverse and includes many small companies that are engaged in interesting developmental work. Among these firms are Akraborg, Akthelia, ArcTract, BioPol, ChemoBacter, Framfoods, Genís, Green in Blue, Grímur kokkur, Grýta, Haustak, Iceprotein, IceWest, Íslensk hollusta, Laugafiskur, Marinox, MPF, NorthTaste, Thorverk, Optimal, Primex and VG Jónsson.

A few of the companies that have made a name for themselves in cosmetics and health products have achieved good results and increased turnover in 2011. However, it is clear that most of the firms engaged in advanced marine processing are quite small and need further R&D investment. In this respect, research funds will not be sufficient. Private investors and financial firms need to participate in these projects if the field is to flourish.

RESULTS

Aquaculture stands still

Considering how many fisheries are influential in aquaculture in Iceland, it was considered reasonable to include aquaculture in this analysis. Production of farmed fish has been very stable since 2007. Around 5,000 tons were produced in 2011, a slight increase from the year before. The export value of aquaculture products was 3.3 bn. ISK in 2011 as 2,200 tons were exported abroad, which is similar to previous years. It his however worth mentioning that in 2012 aquaculture production is expected to grow by 50% since 2011. As a consequence, employment is expected to increase. Some 250 people were employed by aquaculture in 2011.

As shown in this summary, 2011 was overall a good year for the Icelandic ocean cluster. It is obvious that the total scope of the ocean cluster is substantially greater than the direct contribution of fisheries to GDP implies. Along with an increase in this direct contribution, the indirect contribution, in the form of value added in supporting sectors, has risen as well. Furthermore, it can be assumed that the so called demand effects have surged. The total contribution of the ocean cluster to Icelandic GDP is an estimated 27,1%.

The coming years do however seem to pose some distress. Firstly, uncertainties in the global economy could have dramatic effects on all export activities in the ocean cluster. Secondly, it is uncertain how dramatic increases in TAC for cod in the Barents Sea and will effect market prices. In our view it is vital to take immediate action by strengthening international marketing efforts. Lastly, increased taxation and proposed changes in the regulatory environment have created enormous uncertainties that have hindered investment and innovation.

For further information on this report, please contact Haukur Már Gestsson (haukur@sjavarklasinn.is).

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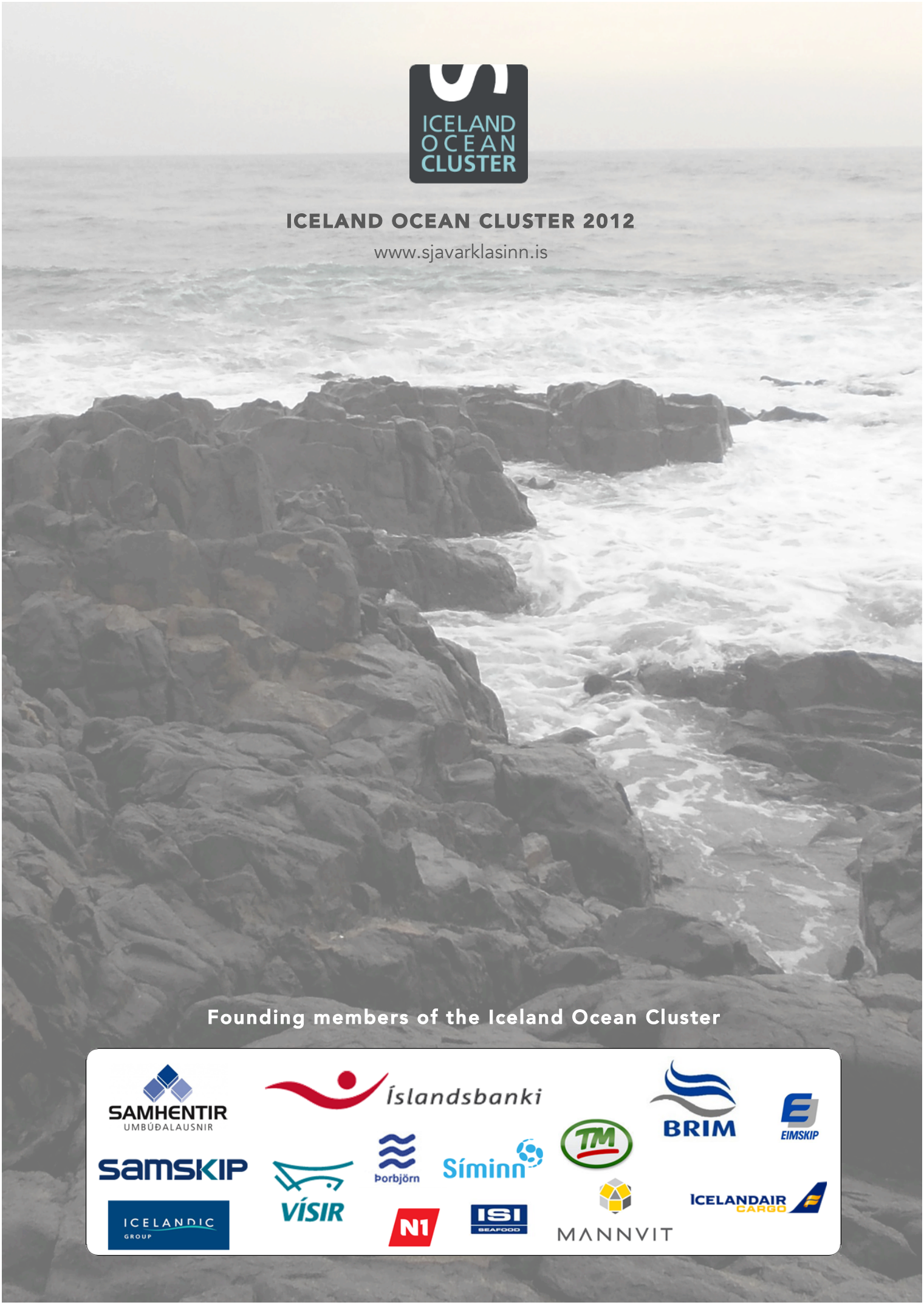

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