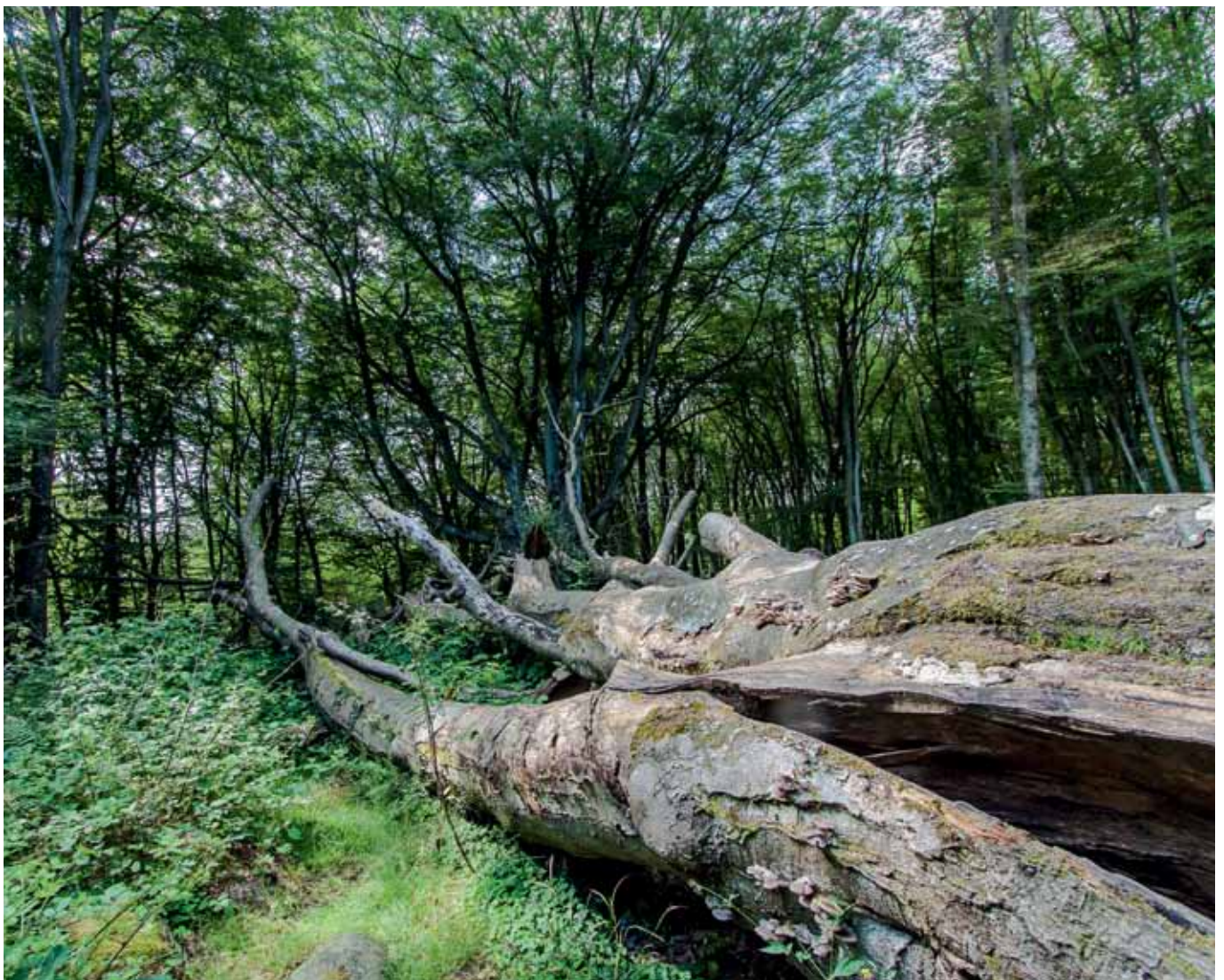


A Nordic perspective on Green growth

Nordic solutions as catalysts
for global change



Key points

This is one of two special papers prepared for NEFCO's 25th anniversary event to be held in Oslo on 12 April 2016. The other is entitled 'Building Bridges to the future'. This report was written by NEFCO in cooperation with KPMG.

- THE WORLD FACES** global challenges such as population growth, water scarcity, exploitation of natural resources and climate change, which require companies to change the way they manage their business. The concept of Green growth offers companies profitable opportunities for both socio-economic and environmental development while contributing to the global goals set by the United Nations 2030 Agenda for Sustainable Development.
- OVER THE LAST DECADES**, the governments and the private sector in the Nordic countries have been at the forefront of developing common approaches to solving environmental challenges. The Nordic countries are pioneers in environmental policy and ranked as high performers when it comes to green innovation and technology. There is also a tradition of working together to find environmental solutions and develop common technological platforms. Evolving global environmental targets and policies create growing international demand for new innovations and technologies. Hence, the Nordic countries have the opportunity to provide leadership by building on the experience gained in the domestic markets to also help achieve Green growth internationally.
- THE NORDIC MARKETS** are small from a global perspective, and internationalisation is necessary to increase the size of the companies' total potential market. The tools and technologies needed to implement and scale up green solutions internationally are already available. Enabling companies to gain access to international markets is essential both in order to secure the Nordic countries' competitiveness, economic growth, employment and innovation, and to facilitate Green growth on a global scale.
- EVEN THOUGH** Nordic companies offer products and services that are in demand on the international market, they face some barriers to internationalisation. The challenges vary with the target market and the size of the company. Financing constraints, capability and skills shortages as well as relationship gaps are especially challenging for SMEs. Regulatory and market barriers, such as legislation and discriminating trade policies, are the main obstacles for larger corporates.
- THE NORDIC COUNTRIES** have developed effective systems to support small and medium-sized enterprises (SMEs) in reaching international markets. There are a number of institutions helping companies overcome their main challenges by providing financial solutions, assistance and knowledge. Through their common efforts, these institutions facilitate Nordic Green growth.
- THE EXISTING COLLABORATION** between Nordic public and private actors can be drawn on when entering international markets, partly by sharing networks and partly by using knowledge already attained by other Nordic companies established in the desired market. By participating in industrial clusters and broader exports of Nordic solutions, smaller companies, in particular, can increase their chances of reaching international markets.

Introduction

The world has undergone massive changes since the Rio Earth Summit in 1992. The human footprint on earth is growing in an unsustainable way. Global megaforges – including urbanisation, climate change, population growth and eco-system decline – will change the world over the next 20 years and beyond.¹ Megaforges do not act alone but as a complex system with unpredictable outcomes, and they will affect key business and industry areas such as energy systems, industry processes, water and waste management, building solutions, infrastructure and transportation². Decoupling human progress from resource use and environmental decline is the most central challenge of our time. This challenge will also be one of the greatest sources of future business success.

During 2015 the future course for global sustainable development was set. The UN Agenda 2030 and the 17 Sustainable Development Goals defined a common global ambition for economic, social and environmental development. Prior to its adoption in September 2015 representatives from 193 UN member states, had already met in Addis Ababa for the Third Financing for Development Conference to agree on how funding should be secured to fulfil such ambitious goals. Moreover, representatives of 196 parties met in Paris in December for the 2015 United Nations Climate Change Conference, COP21 and agreed to limit the temperature rise to “well below” 2°C and “pursue efforts” to keep it to 1.5°C. A common denominator to reach the set out targets is the importance of involving and fostering collaboration between the public and private sectors.

Global megatrends impact businesses / investors / financiers and will challenge traditional business models long term



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What is Green growth?

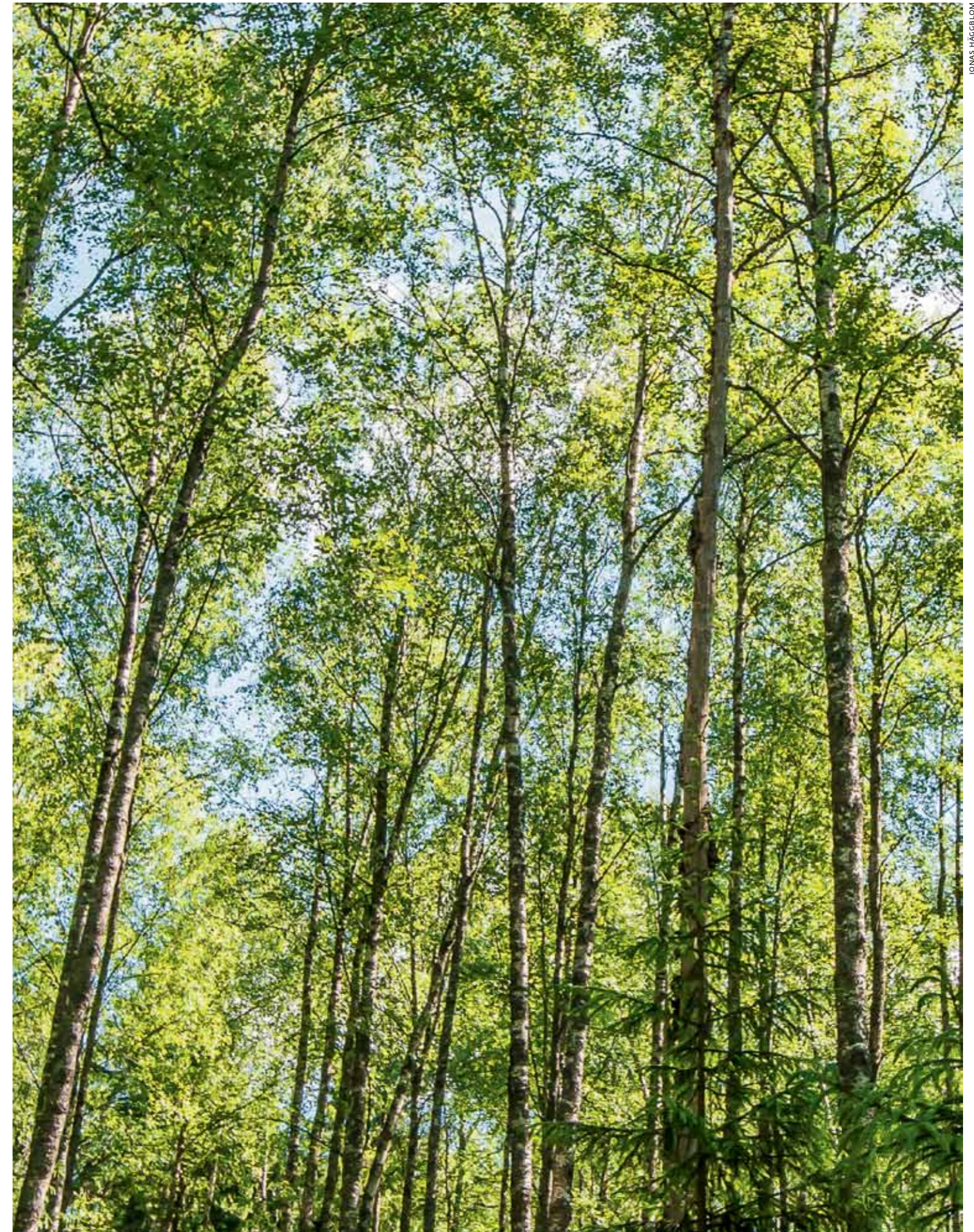
Green growth has been set as a common strategic goal for the future by the Nordic countries in order to effectively address climate change and related global challenges, while at the same time strengthening international competitiveness and securing sustainable economic growth in the Nordic region. In addition to the direct effects of climate change, some of the global challenges that will have wide-ranging socio-economic effects in years to come include population growth, demographic changes, increased urbanisation, water and resource scarcity and deforestation. Green growth can be seen as a response to the requirements and demands set by these changes in order to maintain the conditions for sustainable economic development and growth.

The development of Green growth will entail a target-oriented shift towards production and consumption processes that are based on effective usage of available natural resources and on minimising waste, pollution and climate emissions. Key areas in this development will include new solutions for cleaner energy, environmentally friendly transportation, resource-efficient products, housing and infrastructure as well as improved water supply and treatment processes. The global shift towards green solutions can be further facilitated by the development of new efficient materials and production processes and the implementation of new business models and information technology solutions.

The concept of Green growth was first introduced in 2005³ as a response to global challenges such as climate change and has since been gaining momentum, fuelled by the global financial crisis in 2007-2008 and the global economic slowdown that followed. Several leading international agencies have since introduced their own strategies and policy recommendations for Green growth.⁴ The OECD defines Green growth as “fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies”.⁵ To do this, Green growth must catalyse investment and innovation that will underpin sustained growth and give rise to new economic opportunities and sources of economic growth through productivity, new markets, confidence and stability.

Reaching the targets of Green growth will require not only the implementation of new policies, regulatory frameworks and technical standards, but also investments in new environmental solutions and green technologies. These changes and investments will have to take place in the Nordic countries but, more importantly, internationally, in order to have a tangible effect on a global scale.

The tools and technologies needed to cut emissions are already available, and scaling up just 17 proven low-carbon solutions could cut current global emissions by a quarter by 2030, equivalent to the total emissions of China and Japan combined.⁶ These include, for example, solutions for biomass heating, building efficiency, wind and solar power, vehicle fuel efficiency, appliance efficiency, reforestation and resource efficiency.⁷ This paper argues that the Nordic countries, despite their relatively modest size, can operate as a catalyst for change on a global scale by developing, adapting and implementing green Nordic solutions on the international markets.



The rationale for Green growth from a Nordic perspective

The demand for green solutions is growing. In the last five years, USD 41 billion of venture capital has been invested in cleantech start-ups globally – corresponding to almost a 100 % increase compared with the previous five years.⁸ However, to keep the industry growing, more capital will be required. Investments of almost USD 10.5 trillion will be needed worldwide between 2010 and 2030 in order to have a 50 % chance of limiting the average global surface temperature to a rise of less than 2°C. A large share of these funds will need to be invested in developing countries, and the bulk of the funding must come from and be generated through the private sector. Well-spent public capital can play an important role in facilitating increased private investments however. The global potential of commercial opportunities related to environmental sustainability in natural resource sectors alone is estimated to be between USD 2.1 and 6.3 trillion by 2050.⁹

Green growth has been a common strategic priority for the Nordic countries since 2011 with the aim of making the Nordic countries the leading region for Green growth. The Nordic Council of Ministers, in turn, has launched a priority programme with sector-specific initiatives ranging from education and research, construction, and waste management to public procurement and development aid. The common goal of these initiatives is to offer solutions to major environmental challenges and to enhance the Nordic region's market position with in green solutions. The Council of Minister's status report published in 2015 concludes that there is strong potential for green investments in the Nordic region, especially in capital-intensive areas such as energy, transport, materials and the waste management sector.¹⁰

A shift towards Nordic solutions

The Nordic region has a diversified industrial background that includes heavy industries, such as forestry, oil, mining and steel, as well as highly developed agricultural and fishing industries. This has driven high legislative demands within the environmental field, and the Nordic countries are pioneers in many fields of environmental policy.¹¹ Sweden, for example, is described as one of the “most innovative OECD countries when it comes to environment-related technology, and has pioneered several policy instruments, many based on the principle of putting a price on environmentally harmful

activities.”¹² For nearly a quarter of a century, the economy in the Nordic countries has grown without increasing the level of climate emissions. GDP in the Nordic region has grown by almost 50 % in the last twenty years, while the level of greenhouse gas emissions and energy consumption has decreased by nearly 20 %, showing that this equation is possible to achieve.¹³

Despite their structural differences, over time, the Nordic countries have developed a common, ambitious approach to environmental issues. Governments and private companies have formed a tradition of working together across borders to provide environmental solutions and develop common technological platforms. One example is the Nordic electricity market, which consists to a large extent of renewable energy and is one of the most advanced cross-border energy markets in the world.¹⁴ In the area of energy efficiency, several new technical building codes and product standards as well as labelling of products have been developed.¹⁵ The institutional environment in the Nordic countries has promoted the development of green solutions and innovations, which now have the potential to be implemented and scaled up in foreign markets. Global environmental targets and policies that are currently being implemented will create growing international demand for these innovations and technologies.

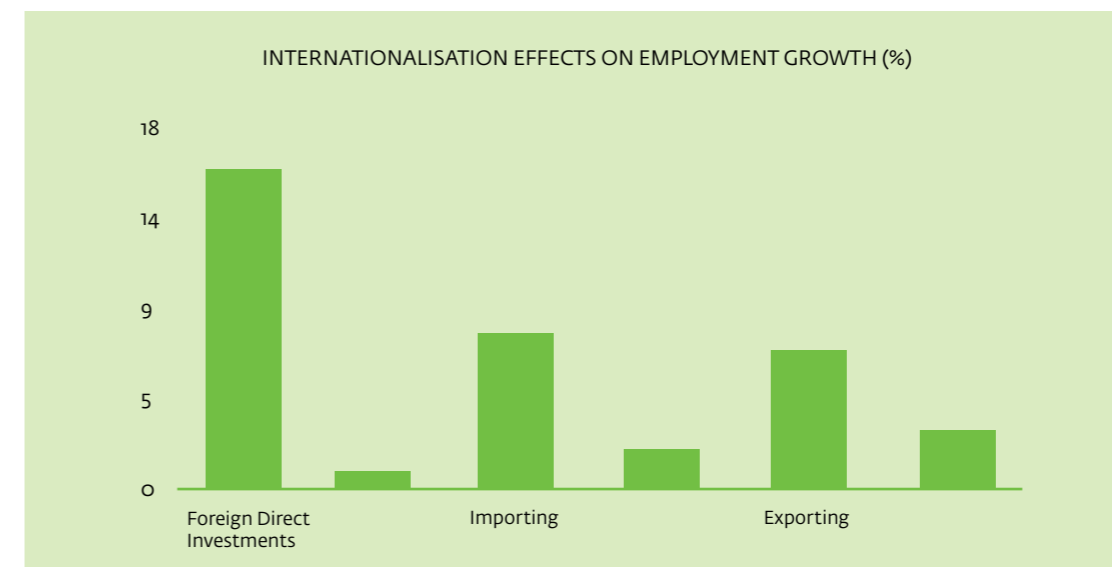
The Nordic countries are ranked as high performers when it comes to green innovation and technology. Finland and Sweden are at the forefront as regards environmental patents filed, and Denmark and Norway are top performers in commercialising and scaling up environmental innovations.¹⁶ The success of the Nordic countries can be explained by the fact that they have “diligently [been] investing in making entrepreneurship attractive, both by giving individuals the necessary training, advice, or connections to ensure their success, and also by greatly rewarding them for their endeavours.”¹⁷ Despite this, there is potential for improvement, especially with regard to commercialising and scaling up environmental innovations.¹⁸

International markets key to Nordic Green growth

From a Nordic perspective, the purpose of ensuring that Nordic companies reach international markets is two-fold: to ensure continued economic growth in the Nordic countries as well as to contribute to sustainable development in the most efficient way possible. The Nordic markets are relatively small from a global perspective, which makes internationalisation highly relevant for increasing the size of companies' total potential market for securing growth. This is particularly true for SMEs, which account for over 90 % of all businesses in the Nordic region and the EU. Internationalisation of these companies brings several positive effects. For example, internationally active SMEs show higher growth in turnover and job creation¹⁹, as illustrated in the graph below.

Possible ways of entering international markets include direct and indirect exports via domestic intermediaries; contractual models such as licensing, subcontracting or long-term contracts; and foreign direct investments (FDI) in the form of greenfield or brownfield investment, or through joint ventures with a local partner. The internationalisation process of SMEs can be a gradual progression from domestic markets to foreign activities, but companies can also be “born-global”, with international operations right from the start. The latter approach is more common among technology-intensive firms with the necessary innovation capability to succeed internationally.²⁰

A comparison of businesses engaged in a particular type of international business activity (importing/exporting/FDI) with businesses not involved in such activity shows that international business activity increases employment growth by up to four times.²¹



Source: Internationalisation of European SMEs, European Commission, 2010.

Companies that export, import or carry out FDI show higher employment growth. A 2010 report from the European Commission shows that over a year, an importing SME generally had 8 % employment growth compared with 2 % for a non-importing SME. The corresponding numbers for exporting and non-exporting SMEs was 7 % versus 3 %. Looking at SMEs with FDI, the employment growth was as high as 16 % versus SMEs without FDI, which only accounted for 4 %.

Similar effects from internationalisation can also be noted in NEFCO's operations related to SME financing through the Nordic Project Fund (Nopef). Internationalisation support to Nordic SMEs has demonstrated positive effects through increased employment and economic growth.²² Every project that has resulted in a foreign business establishment has on average resulted in 14 new jobs, including two jobs being created in the Nordic country of origin. Additional economic effects are also created through growth opportunities for subcontractors both in the Nordic region and in the target countries. On average, every market entry also creates EUR 1 million in investments and EUR 3 million in project-related sales over the following three years.²³ These results illustrate both the benefit and effectiveness of targeted support for early stage SME internationalisation.

In order to reach significant environmental effects, scaling up is not the only necessary measure - reaching the right markets that will provide the greatest impact for green solutions is also important. If emerging and developing economies follow the same path to economic growth as the developed world, the world's supply of natural resources will decrease at an even higher speed, and global greenhouse gas (GHC) emissions will increase significantly. In order to contribute to global Green growth, it is therefore key that these green solutions can reach international markets and that they are adjusted and adapted to the target countries' own needs and capabilities.²⁴

Green growth – a win-win

All in all, internationalisation has a direct effect on the performance of the Nordic countries' economies as well as indirect effects such as increased learning and innovation. Increasing the degree of internationalisation and helping SMEs, in particular, to gain access to international markets is crucial for the Nordic countries' competitiveness, economic growth, employment and innovation. While these benefits are gained by the Nordic countries, internationalisation provides great benefits to the target country through knowledge transfer, employment opportunities and invested capital. Simultaneously, the effects of internationalisation contribute to the global goals set by the UN 2030 Agenda for Sustainable Development.

An example of this win-win cooperation is the joint venture between a Chinese and a Norwegian company presented to the right. By using an innovative Norwegian technique to reuse organic waste and converting it into energy, fertiliser and soil, the company is tackling major environmental challenges related to water pollution and greenhouse gas emissions.

→ The fertiliser plant in Yunnan, China has an annual capacity of up to 50,000 tonnes.



CASE STUDY 1

FERTILISERS FROM ORGANIC WASTE IN CHINA

The Norwegian company HØST, based in southern Norway, has innovated a range of processes to reuse organic waste by converting it into energy, fertiliser, soil and soil amendments. HØST is also Norway's largest supplier of soil and, together with its partners, operates composting plants throughout Norway.

The joint venture Yunnan Sino-Norway Bio-Engineering Co. Ltd. was established to assist the Chinese authorities with solving some of its major environmental challenges: the huge amount of organic waste from urban areas and agriculture causing water pollution and greenhouse gas emissions. The project is a result of a partnership between HØST, the state-owned Yunnan Circular Economy Investment Co. Ltd, and the Norwegian company Norminor AS, following a feasibility study co-financed by the Nordic Project Fund.

The plant opened in 2013 and has an annual production capacity of up to 50,000 tonnes of fertiliser. The fertiliser plant is supplied with raw material from Chinese poultry farms. The plant aims to manufacture mineral-organic fertilisers converted from waste management facilities in Yunnan Province, a region bordering Vietnam and Myanmar with a population of about 46 million.

Challenges and barriers for Green growth

Nordic companies face several challenges when entering international markets, both internal and external, with the barriers' severity differing depending on the destination country. Developed countries, with infrastructure and supply chains similar to those in the Nordic countries, are normally less costly to penetrate than countries geographically and culturally further away.²⁵ The perception of different barriers also varies depending on sector.²⁶ Financial constraints, capabilities and skills shortages, relationship gaps, regulatory and market demands are all perceived as material barriers to internationalisation.

Financing constraints

From a Nordic perspective, the lack of both venture capital and funding for early stage project development has made it difficult to commercialise and establish reference projects for new technological innovations, domestically and on international markets. Furthermore, commercial bank lending to SMEs has declined substantially during the last decade.²⁷ Lack of capital is therefore one of the most important challenges for SME internationalisation.²⁸

The challenge of securing funding seems to be greater the smaller and younger the company.²⁹ Financing is also seen as a greater constraint for companies that primarily target growth on international markets.³⁰ Innovative SMEs with international growth potential are therefore especially vulnerable to both changes in market demands and limited access to finance. Improving their access to finance is therefore crucial to both the development of green technologies and investments in sustainable solutions.³¹

Capabilities and skill shortages

Access to funding is not the only resource shortage that companies perceive as a barrier to internationalisation. Having the right competence, skills and information necessary to enter a foreign market in the organisation is also a challenge. There is a need for increased competence and information concerning foreign clients and their preferences and willingness to pay. Furthermore, knowledge of trade barriers, tax, environmental legislation and competition must also be secured. For small companies, knowledge about foreign markets is more likely to be lacking and costly to attain. The smaller the company, the greater the barrier from the lack of sufficiently qualified personnel is perceived.³²

In foreign markets where new technologies and methodologies could be introduced to leapfrog current technological standards, a potential lack of skills and knowledge in, for example, green technology and standards among public and private actors can also be an obstacle. Even if a technology has been introduced and implemented successfully in the Nordic countries, it can, once again, be considered a new innovation when introduced in a new market. It is therefore highly important for companies to have an understanding of the environmental awareness of the market and the skills and standards of actors and supply chains in the target country.

Relationship gaps

Strong networks in a market not only facilitate market entries and investments but are also key to identifying viable business and project opportunities. Well-developed relationships with both local public and private actors are important, especially when selling and implementing complex solutions. Potential shortfalls in skills or information can partly be bridged by good networks and thus create a better understanding of the differences in business practices, technological standards and market demands. Across different sectors, regions and business sizes, companies experience the lack of contacts as one of the main challenges of internationalisation.³³ However, SMEs tend to lack efficient networks abroad to a greater extent than larger corporates.

Regulatory and market barriers

Barriers due to protectionist legislation and discriminating trade policies can pose great challenges to companies wishing to enter a new market. Market entry barriers and their impacts differ across markets, industries and company types. In general, laws and regulation in foreign countries are perceived to be the most important barrier among medium-sized companies operating in EU-EEA markets and beyond.³⁴ Moreover, regulatory barriers are also considered important in the areas of energy, water and electricity.³⁵ Protectionist measures to support domestic production of environmental technology, national subsidies for fossil fuels and import tariffs on renewable energy are examples of measures that pose challenges for international competition in Green growth.^{36 37}

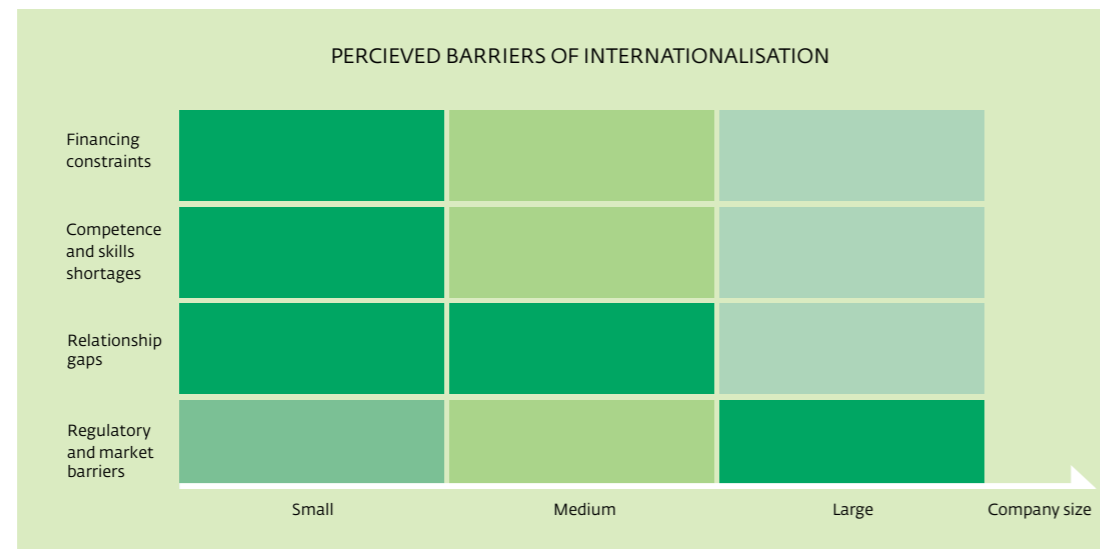
Infrastructural and technology gaps as well as a weak institutional environment can, in some international markets, increase the risk of operations and provide challenges for protecting and enforcing intellectual property rights. It can also be a challenge for securing a stable supply of and access to raw materials and other resources.³⁸

There are also significant institutional challenges related to administration and bureaucracy. Differing technical regulations and country-specific standards often put foreign competition at a disadvantage.³⁹ Lengthy certification processes, visa restrictions to expatriate technical staff and rigorous customs procedures can incur burdensome administrative costs and significantly prolong the time to market.^{40 41} Difficult and costly paperwork is also particularly challenging for small and micro-sized companies that may not have the resources or access to information to the same extent as larger companies.⁴²

Barriers vary with company size and experience

All decisions related to internationalisation are ultimately based on individual cost-benefit assessments, however this process differs to some degree between SMEs and large companies. For a small company, the risk assessment is normally more complex, as capacity constraints and financing need to be taken into account to a greater degree. The fixed costs of internationalisation, in particular, affect the profitability of international operations more for smaller firms than larger ones.⁴³ Large companies normally have stronger expertise and financial capacity for investments, and the critical stumbling blocks are more often related to size and predictability of the financial returns.

Companies have different skill sets, networks, capital and funding opportunities and therefore experience different barriers to internationalisation, as illustrated in the following picture. In areas where one company is weak and faces challenges, another can be strong. By using and strengthening existing Nordic collaboration and networks, Nordic companies can draw on synergy effects when reaching for foreign markets. Interestingly, the barriers to internationalisation are perceived higher for the SMEs that are not active or have plans to become internationally active than for SMEs that are already active in international markets.⁴⁴ More established companies also seem to experience fewer barriers than younger companies.⁴⁵ It is therefore key to promote expansion on the international market as early as possible to build experience and use existing knowledge and presence as a springboard for internationalisation.



Financing constraints, competence and skills shortages as well as relationship gaps are perceived as barriers to internationalisation to a greater extent by smaller companies, while regulatory and market barriers tend to be perceived as more severe by larger corporates. Darker colour indicates greater challenge.

The international operations of large Nordic companies have a very important role in acting as entry points for SMEs to new foreign markets by both creating export opportunities and facilitating the establishment of foreign operations through sub-

sidaries or joint ventures. However, small and medium-scale projects (SMPs) are also necessary to increase market demand for environmental solutions and to create new markets, as illustrated by the example to the right.

→ Maintenance of a wind farm in Noarootsi (Nuckö), Estonia.

CASE STUDY 2

NELJA ENERGIA AS – MARKET MECHANISMS FOR RENEWABLE ENERGY

In 2004, the Norwegian energy company Vardar AS and NEFCO established the Estonian Energy company that became Nelja Energia AS for the purpose of producing renewable wind energy.

The rationale of the company was to enter the new renewable energy market in the Baltic countries, which was under development at the time, as well as the carbon market.

Twelve years later, in 2016, the company is the biggest wind operator in the Baltic countries, producing 38 % of the total wind energy in the region with an installed capacity of 233 MW and an additional 150 MW under development. This can be seen as an example of an investment taking advantage of a new market mechanism.



Bridging the gaps for Green growth

Over the last decades, the Nordic countries have developed solutions that can help combat global challenges such as resource scarcity and climate change. These solutions have already been implemented in many cases on the Nordic domestic markets in a well-functioning institutional environment and are now ready to be adapted for international markets. To be able to reach the same effects abroad, a long-term approach is needed in which both local private and public actors are involved and work together.

A functioning institutional framework can minimise barriers to internationalisation and facilitate Green growth by providing adequate support to companies at the different stages of development. There are a number of public institutions in the Nordic region, both national and regional, that work alongside the industry to promote investments in Green growth.⁴⁶ Together, they enable companies to overcome their main challenges of internationalisation by providing financial solutions and knowledge.

Financing solutions for Green growth

FDI have increasingly targeted emerging markets, from a Nordic and global perspective, with developing Asia being the single largest host region, with one-third of the global FDI flows in 2015.⁴⁷ The increased barriers and risks associated with investments in emerging economies mean that public actors play an important role in mobilising and complementing private capital. Public-private partnerships (PPP) have been developed successfully to mitigate risks and overcome barriers to scaling up Green growth investments.⁴⁸ Another example of a financing model increasingly being used for green investments is Energy Saving Companies (ESCOs), which make it possible to finance energy-efficiency investments through the future savings that will be generated.⁴⁹ Other examples related to climate financing are described in NEFCO's paper 'Building Bridges to the Future'.

Despite progress in transitioning to green financing solutions, infrastructure investments are still constrained by limits in public finance, policy and market uncertainties.⁵⁰ In the Nordic countries, the public financing institutions provide various types of solutions that complement private sector funding for innovation, investments and internationalisation. These include equity investments, loans and grants that are available to minimise the financing constraints faced by companies. Institutions like the Nordic Investment Bank (NIB), NEFCO and the Nordic Development Fund (NDF) have an explicit mandate to direct funding and investments to projects with positive climate and environmental effect. Others, such as the government innovation institutions in each of the Nordic countries, have selected projects or thematic areas related to climate and the environment.

The Nordic development finance institutions (DFI) have seen a strong increase in green investments during the last decade. Finnfund and Norfund, in particular, have increased their activities in the field of renewable energy; Swedfund has a strong track record within bioenergy, energy efficiency and water supply; and IFU has increased climate-related funding. Export Credit Institutions have also increased their focus on integrating climate and environmental concerns into their risk assessments in recent years, e.g. by following the IFC performance standards.⁵¹ Just as with climate and environmental issues, the Nordic institutions promote internationalisation in different ways – NIB provides senior loans, NDF provides grants, and NEFCO provides risk capital and other financial instruments. NEFCO enables internationalisation by participating in investments, facilitating Nordic exports and financing feasibility studies, as seen in the following example.

→ Salling Plast's piping solutions contribute to reduced energy consumption and thermal heat loss.

CASE STUDY 3

ENERGY-EFFICIENT PIPING SOLUTIONS IN BELARUS

The Danish company Salling Plast A/S established operations in Belarus with the production of shrinkable casings, fittings and assembly bends for pipes for use in district heating and wastewater treatment projects. A new production line set up in Orsha in eastern Belarus will boost the company's production and provide sustainable piping solutions for the Belarusian market. NEFCO participated in the investment after having co-financed the feasibility study through the Nordic Project Fund.

The environmental benefits arise from reduced thermal heat loss when the piping solutions are put into use. Best available technology is used with recycling in the production, such as reuse of the polyethylene high-density residues in the production process. The products also have important cost benefits. The company's shrinkable casings are important sub-components of energy-efficient and cost-effective district heating systems, since the casings reduce leakages and maintenance costs of piping networks.



Tools for bridging relationship gaps and increasing knowledge

The global shift towards a green economy requires relationship building with and between private and public actors in both the Nordic and the international market, as few companies provide an overall platform solution to environmental challenges. Instead, Nordic companies often act as component suppliers and are generally not able to promote large industrial projects alone.

In the Nordic countries, industrial clusters and networks are increasingly recognised as an effective instrument in creating attractive environments for business development. These initiatives help companies leverage on each other's knowledge in international markets and are a way of providing overall solutions to environmental challenges. In general, possibilities for improved competitiveness and new business opportunities are the major driving force behind the development of industrial networks.⁵² The development of industrial networks and cooperation has been actively facilitated by the public sector, in particular in Denmark and Finland, while Iceland, Sweden and Norway have seen a stronger role for private sector initiatives.⁵³ In all of the Nordic countries, industrial clusters and networks can be seen as supporting the development of Green growth however.

In the Nordic countries, several industrial clusters have emerged. In Denmark, for example, over 60 companies are active in a wind power cluster in the Aarhus-region alongside companies like Vestas and Siemens. In Finland, there are fast-growing clusters in the field of cleantech, digitalisation and the bio- and natural resource economy. In Norway, over 75 businesses are part of a regional cluster in Southern Norway focusing on maritime and offshore industry, and in Iceland over 50 companies are engaged in a cluster within geothermal energy. There is also strong potential to further increase Nordic collaboration efforts between national clusters in areas where the Nordic countries exhibit globally competitive strengths.⁵⁴

The Nordic support agencies work closely with clusters to facilitate their development. NEFCO has worked with a range of companies in industrial clusters identified as having high potential for internationalisation. For example, over 40 of the companies in the wind power sector in Denmark have been granted conditional loans for internationalisation through Nopef since 2009.

PROVIDING EXPERTISE AND KNOWLEDGE WITH A GLOBAL SCOPE



The shift towards a green economy and increased internationalisation contributes to improved access to new foreign markets for solutions developed in the Nordic countries. Sufficient knowledge of export markets and the capability to identify foreign business opportunities remain a key challenge, in particular among SMEs. Broad geographical scope is reached through the various funds managed by NEFCO. The map shows countries (dark green) in which NEFCO has ongoing projects or projects under implementation. In addition to providing financing, NEFCO adds value and reduces risks by sharing its expertise and knowledge with the companies with which it works.

Growth through collaboration and partnerships

The existing collaboration between Nordic public and private actors can be drawn on when entering international markets, partly by sharing networks and partly by using knowledge already attained by other Nordic companies established in the desired market. By participating in broader exports of Nordic solutions, small companies in particular can increase their chances of reaching international markets. Just as in the Nordic domestic markets, where collaboration between several private and public actors enables holistic solutions, the Nordic tradition of working together could create greater opportunities in foreign markets. As an example, projects financed by Nopef indicate that two-thirds of all Nordic SME

companies co-operate with subcontractors from two or more Nordic countries in their internationalisation process. The Nordic collaboration on district heating in Ukraine, as presented to the right, is an example of this. NEFCO's experience shows that Nordic export opportunities arise more frequently in countries where Nordic companies are already established. Internationally active companies therefore act as bridgeheads in new markets for companies that are only active in the Nordic countries. Hence, exports and FDI are strongly linked and often complementary.

→ Hundreds of schools and day-care centres in Ukraine are benefiting from Nordic investments in municipal energy-efficiency.



CASE STUDY 4

INCREASING THE MARKET: DISTRICT HEATING AND ENERGY EFFICIENCY IN UKRAINE

As part of Ukraine's efforts to reduce energy consumption, NEFCO has actively been working with municipalities to improve energy efficiency in public buildings and district heating systems. This effort includes 70 projects in 44 municipalities. The potential district heating market in Ukraine is huge, being a country of more than 40 million people. This work is largely a collaborative effort with funding from Sweden, Norway, and Finland. In addition, NEFCO receives funds from E5P (www.e5p.eu) and cooperates with Germany and the USA in the identification activity.

NEFCO's efforts start out with small projects that pave the way for larger investments with financing from NEFCO as well as larger institutions such as European Investment Bank (EIB) and European Bank for Reconstruction and Development (EBRD). SMP enable NEFCO to support municipalities to start their reform path to increased transparency, financial sustainability and predictability and thereby increase the market. NEFCO's objective is to increase the creditworthiness of municipalities and utilities by allowing them to make rational financial decisions using the best available expertise and to give companies confidence in the market. This is a long process, but the path to success usually starts with one small step.

In addition to the positive climate effects, NEFCO's reason for being active in this field is that the Nordic experience and expertise in the field is state of the art. Nordic companies are usually indirectly involved (with the exception of consultancy companies) as supplier to local construction companies competing for contracts as they possess the technology with best energy savings potential, however, this only works as long as some Nordic companies are active in the market locally.

Partnerships between public and private actors can mitigate the risks associated with introducing new innovations, particularly by enabling SMPs complemented with relevant information and training. Collaborations through SMPs can, for example, help to overcome weakest link problems, where each individual actor possesses specific competence relevant to the project but at the same time depends on many other actors to succeed. Examples of infrastructure investment through SMPs include irrigation systems for smallholder farmers, infrastructure development for production and distribution of biodiesel, off-grid rural renewable energy, and the use of ICT infrastructure within the agricultural sector in developing countries.

Public financial institution can play a vital role in encouraging international growth by facilitating access to international markets for green technologies and solutions. Financial support for feasibility studies, capacity building, pilot installations and demonstration projects have proven to be cost-efficient mechanisms in programmes such as Nopef and the Nordic Climate Facility. Pre-studies are also an effi-

cient tool in minimising relationship gaps and attaining the necessary information concerning regulations in foreign markets, and they enable companies without operations in a foreign market to become familiar with the local business landscape.

Nopef's experience of financing feasibility studies shows that some 60 % of funded projects have resulted in a new foreign market establishment. The remaining 40 % should not necessarily be considered failures however – it is often an informed decision not to enter a foreign market as the prerequisites for profitable business are not in place. Capabilities and skills shortages can also be managed through the DFI partnership programmes. These programmes enable partnerships between Nordic companies and companies in low income countries to increase skills, knowledge transfer and capacity with the local partner.



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Concluding remarks

A key message of this paper has been that new ways of thinking, living and doing business are needed in order to adapt to global trends and secure sustainable development. This will require innovative thinking, new technologies and new platforms. To combat the global challenges successfully – such as population growth, water scarcity, exploitation of natural resources and climate change – knowledge, partnerships, financing and well-functioning institutions are needed worldwide.

The Nordic countries are currently at the forefront of developing green innovations and solutions in areas such as wind power, biofuels, heating systems, geothermal energy, energy-efficient buildings and industrial processes. The move towards a carbon-neutral environment will create further opportunities for technological innovation and new business models. Many environmentally friendly technologies have already been implemented successfully in the Nordic region and have the potential for even greater effects if implemented in foreign markets. Other types of innovations and solutions need to reach and be adapted to international markets at an early stage in order to scale up and thereby achieve substantial and tangible effects.

Through a wide spectrum of funding solutions, such as equity investments, project grants and support as well as tailored and competitive loan products, the Nordic institutions can work with private companies and support them in reaching international markets and scaling up green innovations. The Nordic governments have an important role to play in providing support and financial mechanisms that can facilitate the commercialisation and scaling up of proven green technologies. Assistance with capacity building and knowledge transfer, support for feasibility studies and pilot projects, and the development of public-private partnerships can be efficient tools for overcoming the lack of skills and market knowledge.

NEFCO's experience of financing SMP/SME projects shows that economic gains and environmental benefits are often complementary and can be achieved simultaneously. Existing networks in the Nordic countries, such as industrial clusters, can also be drawn on in accessing and understanding international markets – as well as in offering overall solutions. These solutions and tools provided by public and private actors in the Nordic region can offer a substantial contribution in combatting global challenges and securing sustainable development.

ABBREVIATIONS

DFI	Nordic development finance institutions
ESCOs	Energy Saving Companies
FDI	Foreign direct investments
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
GHG	Greenhouse gases
NIB	Nordic Investment Bank
NDF	Nordic Development Fund
NEFCO	Nordic Environment Finance Corporation
Nopef	Nordic Project Fund
PPP	Public-private partnerships
SMEs	Small and medium-sized enterprises
SMPs	Small and medium-sized projects
UN	United Nations

← Stormy waters. Nordic investments in Green growth will also benefit the ecological state of the Baltic Sea.

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About NEFCO

The Nordic Environment Finance Corporation (NEFCO) is a financial institution established in 1990 by the Nordic governments to address environmental priorities and projects initially in Eastern Europe. Since then, the governments have given NEFCO further assignments that address environmental priorities and projects globally.

Towards 2020, NEFCO's vision is to further deepen and broaden its role as a visible and potent investment partner and fund manager for SMPs relevant to the environmental priorities set by the Nordic governments and to continue to contribute to the generation of positive environmental impacts in the Nordic regions and globally.

The mission for NEFCO as an IFI is to generate added value for the Nordic governments and the countries where it operates through its positive environmental impacts, based on NEFCO's competitive advantages as a financier owned by the highly rated Nordic states.



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