

Towards a new innovation policy for green growth and welfare in the Nordic Region



Towards a new innovation policy for green growth and welfare in the Nordic Region

Author(s):

Monday Morning for Nordic Innovation

March 2012

Nordic Innovation Publication 2012:02

**Towards a new innovation policy
for green growth and welfare in the
Nordic Region**

Nordic Innovation publication 2012:02
© Nordic Innovation, Oslo 2012

ISBN 978-82-8277-008-8 (Print)
ISBN 978-82-8277-009-5 (URL: [http://
www.nordicinnovation.org/publications](http://www.nordicinnovation.org/publications))

Authors

Written by Monday Morning (Mandag
Morgen) for Nordic Innovation.

Mandag Morgen
Postbox 1127
DK-1009 København K
Denmark

Publisher

Nordic Innovation
Stensberggata 25
NO-0170 Oslo
Norway
Phone: (+47) 22 61 44 00
info@nordicinnovation.org
www.nordicinnovation.org

Layout: Nordic Innovation
Design: Miksmaster AS
Cover photo: iStockphoto.com
Production: Allkopi AS
Copies: 150

This publication can be downloaded free of
charge as a pdf-file from:

www.nordicinnovation.org/publications

Other Nordic Innovation publications
are also freely available at the same web
address.

Printed on environmentally
friendly paper.



Copyright Nordic Innovation 2012. All rights reserved.

This publication includes material protected under copyright law, the copyright for which is held by Nordic Innovation or a third party. Material contained here may not be used for commercial purposes. The contents are the opinion of the writers concerned and do not represent the official Nordic Innovation position. Nordic Innovation bears no responsibility for any possible damage arising from the use of this material. The original source must be mentioned when quoting from this publication.

Foreword



Nordic Innovation's vision is "*The Nordic countries as a world-leading region for innovation and sustainable growth.*" To achieve this we acknowledge that Nordic societies, including Nordic businesses, will have to transform so that we can fully utilize the potential that our natural resources and well developed welfare systems provide us.

As a Nordic institution under the Nordic Council of Ministers, we hold the secretariat for the Nordic Lighthouse project "*Nordic Innovation Forum*". The objective of the project is to find ways to stimulate innovation within green growth and welfare in the Nordic region as described in the programme for *Nordic Cooperation on Business and Innovation (2011-2013)*.

The Nordic Ministers of Trade and Industry have emphasized the importance of Nordic cooperation to meet the challenges the countries face due to climate changes and global competition. The Nordic Innovation Forum shall focus on innovation and how innovation can enhance the transformation to an economy based on green growth and simultaneously secure welfare for the Nordic citizens. It is through insistent innovation that the Nordic countries can be in the forefront, create new jobs and maintain competitive.

The steering group of Nordic Innovation Forum wanted an overview over Nordic strengths as well as policy in the fields of green growth and welfare. Very few policy documents discuss how these two can be interlinked.

The steering group therefore wanted to map how the different Nordic innovation policies addressed this as a foundation for the project's work. The Danish think tank Monday Morning was given the task to map policy documents, national innovation actor's strategies, academic papers and reports, as well as conduct interviews with stakeholders. They have also mapped international innovation trends and present a selection of best practices from throughout the Nordic countries. Based on all this they present a SWOT-analysis over Nordic strengths and weaknesses with regards to innovation in green growth and welfare. This is an enormous field to grasp, and the study is not intended to cover all issues that might be relevant in a scientific and detailed way, but rather meant to give a brief overview.



This report is a good starting point for new ideas and we hope it will generate a fruitful discussion. The steering group will after further work deliver an action orientated agenda on what the Nordic ministers of Trade and Industry should address.

Nordic Innovation hopes this work will feed into the national agenda and contribute to sustainable growth and welfare in the Nordic region.

Kari Winqvist
Managing Director (Const.)
Nordic Innovation

Table of contents

Executive summary	12
The global quest towards green growth and welfare innovations	12
Nordics aiming at users	13
Innovation and a big public sector	14
The need for change	15
New Nordic Innovation	16
The first three steps towards New Nordic Innovation (recommendations)	17
Main findings in this report	18
1. Introduction: New Nordic Innovation – Pioneering Sustainability	20
Global Demand for Sustainable Solutions	21
Environmental Sustainability – a part of Nordic thinking	21
Economic sustainability – resilience in time of crisis	22
Social sustainability – the middle way	22
New concept of innovation needed	23
New Nordic Model	25
Figures	26
2. Innovation Policy Trends in the Nordic Countries	31
Innovation in green growth and welfare – a way to deal with major societal challenges and global competition	31
Nordic countries moving towards user-orientation and open innovation	32
Innovation high on the political agenda	32
Conclusions from our Nordic mapping	33
Summary of national innovation trends	33
<i>Finland</i>	34
Innovation strategy: solving the world's wicked problems	34
Innovation trend: demand- and user-driven	34
Green growth and welfare	35
<i>Iceland</i>	37
Innovation strategy: research and competitive funding	37
Innovation trend: focus on design and public procurement	37
Green growth and welfare	38
<i>Norway</i>	40
Innovation strategy: focus on entrepreneurship and technology	40
Innovation trend: user-centred design and innovative public procurement	41
Green growth and welfare: few initiatives but growing political attention	41
<i>Denmark</i>	43
Innovation strategy: fragmented, but soon-to-be changing	43
Innovation trend: First-mover on users, moving towards PPPs and public procurement	44

Green growth and welfare.	44
<i>Sweden</i>	47
Innovation strategy: from science-driven towards challenge-driven	47
Innovation trend: renewing the role of the public sector	47
Green growth and welfare.	48
3. Mapping International Trends.	50
Conclusions from our mapping of international trends	51
Innovation in the EU and OECD	51
Germany	52
The Netherlands	54
Korea	55
Japan	56
4. Selected Best Practices – Pathways Toward New Nordic Innovation	59
1. <i>Public Tendering and Procurement</i>	59
Conferences of dialogue	60
Learning about innovative procurement	60
Finnish Environment Institute	61
Karolinska Hospital	62
2. <i>Exporting Nordic Welfare and Green Growth</i>	63
The Finnish Wellbeing Center	63
Navigator Prosjektet	64
Cargotec	64
3. <i>Innovation Together With Users.</i>	65
Ideas Clinic	66
Living Labs	66
4. <i>Cluster Thinking in Green Growth and Welfare.</i>	67
Welfare Tech Region	67
The Finnish Cleantech Cluster	68
5. <i>Three-dimensional Sustainability – Initiatives Synthesizing Environmental, Economic and Social Challenges.</i>	68
IBikeCph	68
Telemedicine	69
New Nordic Food	71
Vatnavinir	72
The Business Innovation Fund	72
5. SWOT Analysis	74
Introduction	74
Strengths.	76
Values and visions	76
Good governance	77
A history of promoting innovation through legislation, norms and standards	77
Empowering users	78
Employees key to innovation	79
Networks succeed at innovation	80
Nordic countries as global test markets	81
Weaknesses.	81
Innovation only flourishing locally	81
Fragmentation – lack of coordination	82
Not-Invented-Here Syndrome	82

Public institutions are rewarded for stable operations – not innovation	83
Is small beautiful? – Scale is lacking	84
<i>Opportunities</i>	84
Enabling technology	84
Innovative procurement	85
Rewarding copycats	86
Branding Nordic strengths to boost export	86
<i>Threats</i>	87
High costs in Nordic countries	87
The Red Ocean – Small Nordic markets while global growth lies in Asia	88
Austerity predominates instead of innovation	88
Figures	89
6. New Nordic Innovation – a common platform	94
Recommendations for strengthened Nordic cooperation	95
Sources	97
Sources Best practices	101
Interviewees	104

Executive summary

This is a report on how the Nordic countries via innovation can reinvent the Nordic model – making it a more sustainable role model for addressing global challenges. More sustainable because it is based on sustainability in three dimensions: environmental, social and economic – and the links between the three.

Innovation in green growth and welfare is already taking place in the Nordic region. But this report goes one step further and looks at how innovation policy can foster and promote synergies between green growth and welfare. In other words, it is about finding methods and policies that connect the three dimensions of sustainable development.

A reinvention of the Nordic welfare model would not only be the role model for welfare states, but for welfare societies. Societies having a more open approach to innovation that involves users, focuses on demand and secures sustainable public procurement, where the public sector catalyzes partnerships with companies, citizens and organizations, and adds societal and environmental dimensions to innovation. In short: New Nordic Innovation.

New Nordic Innovation is not merely a question of addressing the main societal challenges of the Nordic region; the solutions must also be sustainable. In this respect, the Nordic region continues to carry the torch first lit by former Norwegian Prime Minister Gro Harlem Brundtland in her milestone report to the UN, Our Common Future. Our findings show that innovation in green growth and welfare are integral to innovation policies in the Nordic countries, and that political will exists to bring together the three dimensions of sustainability.

This report is structured as follows: First, we thoroughly map trends in national innovation strategies in the Nordic countries. The mapping is based on policy documents, national innovation actor strategies, academic papers and reports and supplemented by interviews with stakeholders. Second, we map international innovation trends. This mapping is primarily based on key national innovation policies, international organization strategies and academic reports and papers. Third, we present a selection of best practices from throughout the Nordic countries. Fourth, a SWOT analysis based on the mappings and interviews with key stakeholders and innovation experts from the Nordic countries is laid out. Finally, we propose recommendations for Nordic policymakers to move towards a new Nordic innovation policy. More than 130 written sources are referenced and 28 experts interviewed.

The global quest towards green growth and welfare innovations

When we understand that our present lifestyle is not sustainable, the need for innovation

becomes more evident. It is simply not an option to continue as if globalization, climate changes and the ageing of populations do not pose any challenge to the Nordic countries. They do.

First, globalization is seen as a challenge, as it involves growing competition from abroad. Even so, the Nordic countries are confident that globalization presents opportunities for innovation and market shares, especially in the areas of green growth and welfare. Second, on climate change, all Nordic countries agree there is a growing demand for green sustainable solutions, and that they have significant competitive advantages in this area (though varying from country to country).

Third, demographic changes combined with constraints on public spending are seen as major drivers for welfare and public sector innovation. Furthermore, the economic crisis, which surfaced after most of the Nordic national strategies were launched, has made clear the need to rethink strategy and innovate. In the years ahead – our research and interviews find – budget constraints will be the main driver for innovation within the public sector.

Our analysis is not exclusively Nordic. The mapping of international discussions about innovation and innovation policies shows there is agreement amongst OECD and the EU on what challenges to address. Global innovation leaders are betting on innovation in green growth and welfare.

The EU and OECD each presented new strategies in 2010 linking innovation policies to major societal challenges – notably, from our mapping: climate changes, health and ageing of societies. Behind this decision lies a robust assumption: Challenges represent problems to be solved and new markets and demands to be met.

Globally, there is no question that problems such as climate changes and the ageing of populations must be addressed. Not surprisingly, Asian OECD members such as Japan and South Korea focus less on problems posed by globalization than their Nordic and European counterparts. That underscores one of the most obvious problems for the Nordic countries. Interviews conducted for our SWOT analysis reveal worries over the high projected costs to meet the societal challenges just mentioned.

Also, an emphasis on sustainability is not unique to the Nordic region. Germany and The Netherlands share the vision of sustainability, and it has trickled down to their understanding of innovation. Our mapping shows that Germany and The Netherlands have joined the five Nordic countries in the search for sustainable solutions.

It is therefore not evident that a combined focus on globally acknowledged challenges and sustainability alone will give the Nordic countries an upper hand in the future. There must be a unique Nordic add-on if the innovative strategies are to be advantageous for the Nordic countries in an ever-more intense global competition.

Nordics aiming at users

The OECD encourages governments to extend the domain of innovation policies beyond ministries of science and technology and adopt a “whole government” approach. Innovation

shall be mainstreamed and integrated into every part of the public sector.

From this perspective, the Nordic region is well positioned, as it has been developing a more open and inclusive understanding of innovation than other countries analyzed in this study.

The five Nordic countries stand out when they open up the innovation process and include a variety of stakeholders, notably professionals and users, in the development of new solutions. At its best, it increases the ability to target needs much more precisely, increasing the probability of success.

Our mapping shows a political dedication in the Nordic countries to give the user a much more prominent role in the innovation process. User-driven innovation is mentioned in the strategies of all the Nordic countries; if governments deliver on their words, innovation will be an area of great activity in the years to come.

In this development, the SWOT analysis shows that the Nordic countries can draw upon common strengths, such as a short power distance, with flat hierarchies indicating open access for employees to their immediate boss. Within healthcare, for instance, it is widely acknowledged that employees are the main source of innovation.

If the Nordic countries succeed in tapping and implementing innovative ideas from professionals, they give themselves a head start in the competition to create solutions to globally accepted challenges.

But it is not just a question of utilizing insight from employees. A truly open process of innovation must also focus intensely on the needs of users. Again, this might prove to be a shared Nordic advantage in the years to come because, just as employees perceive a short power distance in the workplace, Nordic citizens have easy access to employees in public institutions.

“Public sector innovation has had a negative wording, because people think of losing jobs and cutting services, but it is really about delivering the policies in a more efficient way and responding to the end needs of the user. Understanding what their needs are and what their experience has been and deliver the service based on that experience,” says Máire Geoghegan-Quinn, EU Commissioner for Research, Innovation & Science.

Nordic citizens are positioned to be the best imaginable partners in the innovation development process. They are well educated, demand good lives, and are well adapted to use new technology. Nordic citizens are some of the most e-ready in the world.

The focus on user-centred innovation can establish new partnerships between public institutions and citizens, opening up new ways of designing public services, and changing the character of the welfare state to a welfare society, where the state delivers fewer solutions and instead empowers citizens to take the lead.

Innovation and a big public sector

In 2010, the EU launched its “Europe 2020 Strategy,” where the most prominent target related to innovation is the goal of spending of 3 pct. of GDP on R&D by 2020. The European strategy

emphasizes the possibility of using public procurement as an instrument in innovation policy.

The EU Commission estimates the size of the public market in the EU to be around 17 pct. of GDP, or more than 2,200 billion euros. The public sector in the five Nordic countries is bigger than in most other European countries, underscoring the possibility of using the sheer size of the public procurement to catalyze innovation.

All Nordic countries have set up strategies for stimulating innovation through public procurement. The prevailing idea is that great potential for success exists if the public sector does more to demand solutions to specific societal needs instead of predetermined products.

There is a longstanding tradition of public institutions testing new products. Welfare clusters such as the Welfare Tech Region is one example of public institutions cooperating with private actors to stimulate innovation in a sustainable direction. Also, it is apparent from the SWOT analysis that one strength of Nordic societies is their ability to act as test markets for innovative solutions within welfare and green growth.

Private-public partnerships (PPPs) are increasingly seen as a way forward when pushing innovation in public sector. The Karolinska Hospital (See Best Practices) is an example that integrates innovative healthcare solutions with high environmental ambitions.

In the healthcare sector, our SWOT analysis finds an advantage for big public institutions in the Nordic region. They provide most of the service in all five Nordic countries. Compared to the United States and other European countries, there are fewer actors to coordinate in the Nordic region.

The need for change

Positive preconditions must prevail over huge challenges. Owing to strained public budgets, enormous climate and environmental problems, ageing populations, and expectations of increasingly better quality, the Nordic welfare states cannot progress by offering more of the same and well-known services.

There is a need for innovative leaps forward in the Nordic countries' efforts to create sustainable societies.

Our mapping shows that innovation is high on the political agenda in the Nordic countries. In 2011, two governmental platforms were presented in Finland and Denmark. Both included key sections on innovation policy, with promises for further development of existing policies. In Iceland, the government's central strategy document, *Iceland 2020*, presents innovation as a key tool in achieving a dynamic society founded on welfare, knowledge and sustainability within the next ten years. In Sweden, a new national innovation strategy is due to be released in 2012, and is now in public hearing.

Historically, the five Nordic countries have actively invested in innovation through a remarkable variety of instruments. Innovation is not only a question of R&D but of attempts to create new patterns of cooperation between partners from the public and the private spheres. And the innovation potential exists: "I see a fantastic desire to innovate," says Helena Tillborg from Teknopol, a public advisor for companies involved in innovation in Sweden.

Approaches to innovation are changing throughout the Nordic region. Our mapping has shown a trend towards more open and broad-based innovation that focuses on demand and engages the public sector in stimulating innovation.

When the focus is on innovation within healthcare, for instance, public regulations can empower the end-user – helping citizens become customers of new technology and improve their lives.

Our SWOT analysis of the relationship between the public sector and innovation within green growth and welfare shows that even though innovation flourishes in all five Nordic countries, no country excels in using the gained knowledge from projects and initiatives on a national scale. It is rare that experience from innovative projects is shared with users in similar situations.

The coming years will be characterized by a still-more competitive global environment, where countries and companies rush to deliver solutions to problems the Nordic countries want to solve. A range of European countries, with Germany as the leader, have identified the same set of challenges, and invest massively in solutions, in partnership with companies such as Bosch and Siemens. Our mapping shows that South Korea and Japan also hope to make big gains in areas such as green tech and welfare technology.

By using the public sector to catalyze innovation within green growth and welfare, the Nordic countries can better position themselves relative to other European and international competitors.

New Nordic Innovation

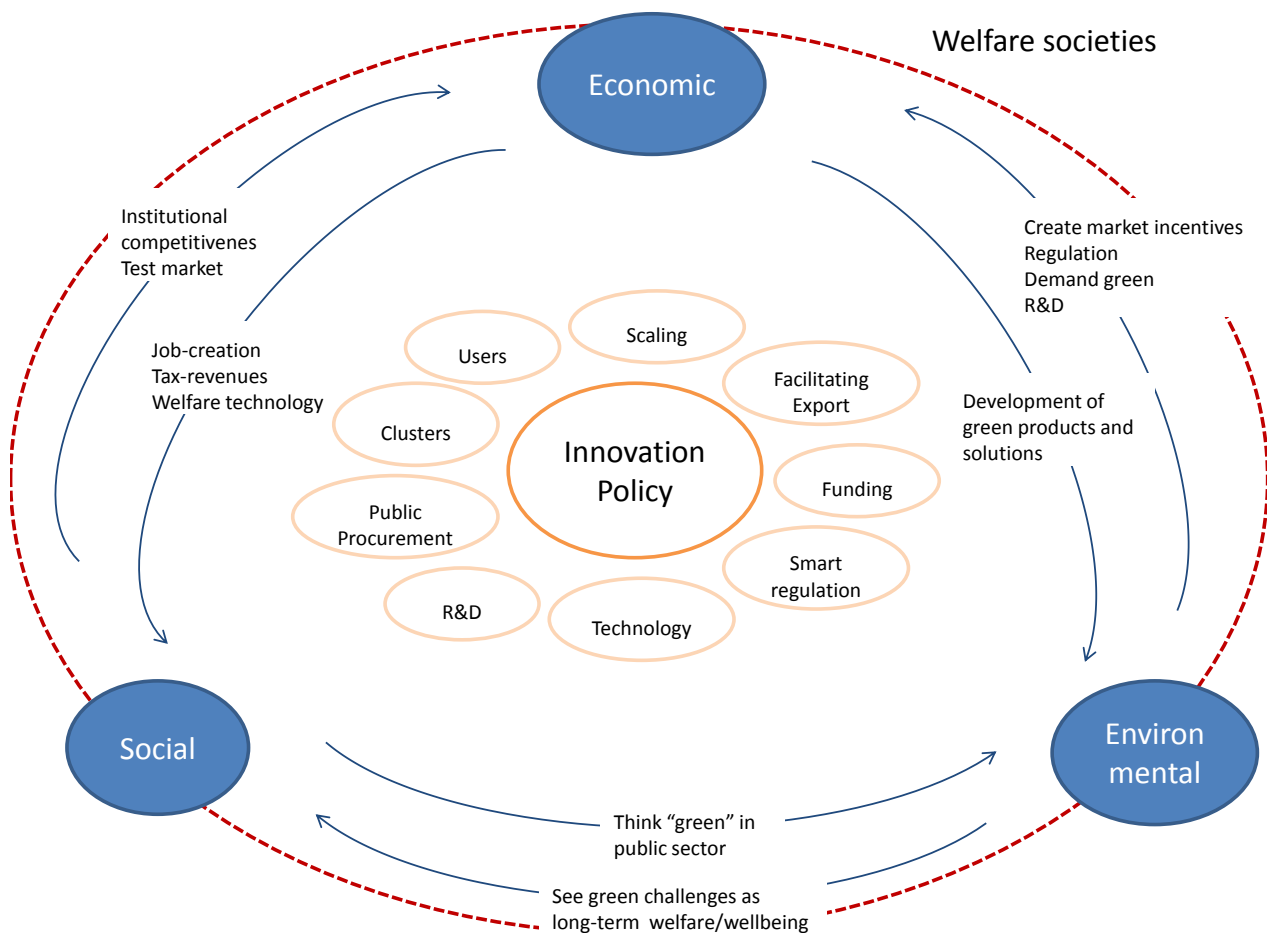
The aim of a New Nordic Innovation policy should be to link innovation capacities with key challenges and turn them into opportunities for Nordic countries and businesses. But this is not enough. If societies are to become sustainable, they will need an innovation policy that exploits the great potential for synergies between economic, social and environmental challenges (See Figure 1).

This entails a shift from viewing our Nordic model as discrete welfare states to seeing them as welfare societies. The shift is a prerequisite for finding synergies between green growth and welfare. Welfare societies see social services not only as means to tackle social challenges such as ageing and social exclusion, but also as means to enhance the national competitiveness, empowering people with human capital. Looking at it another way, it is about the public sector inviting other actors – companies, NGOs and citizens – to help solve social challenges by providing new technology and solutions.

Likewise, the public sector should “think green” in its social services and become a leader in securing a sustainable and healthy environment. We also need to think of environmental sustainability as a welfare issue. The “Telemedicine” and “New Nordic Food” cases show synergies between green growth and welfare do exist. But they need to be found, nurtured and shared. Today, awareness of the synergies between innovation in green growth and welfare does not exist, and the few initiatives that do establish a connection do so coincidentally. Innovation abounds in the Nordic region, but it needs to have the right focus.

A New Nordic Innovation policy should become a major driver promoting this shift, placing itself in the centre of the sustainability triangle. It should involve all sectors of society in solving the wicked societal challenges, and it motivates the public sector to become a driver through measures such as public procurement, R&D, smart regulation, cluster creation, user-involvement, provision of test markets, and scaling. Figure 1 summarizes the elements of New Nordic Innovation.

Figure 1



The first three steps towards New Nordic Innovation (recommendations)

In three areas, new cooperation can support the Nordic countries in their effort to reform innovation and innovation policies in order to meet pressing challenges.

- 1. Sustainable innovation.** There is a need to develop a new Nordic framework for innovation that follows the three aspects of sustainable innovation – economic, environmental and social. A key issue here is that the public sector acknowledges it's responsibility for innovation and for the need to embed sustainability early in the innovative process

2. **Scalable innovation.** One challenging finding in the SWOT analysis was that innovation in the Nordic region is fragmented. Too many good examples of innovation are not adopted on a wider scale. The picture from above is of innovation as if it were fenced in.
3. **User- and employee-driven innovation.** The Nordic countries distinguish themselves from most other countries with a high level of trust and a comparably low power distance at work. Features which may be developed and nurtured as particularly Nordic strengths in innovation.

Main findings in this report

Nordic innovation policy trends:

- Three overriding drivers for innovation stand out in innovation strategies and documents in the Nordic countries: globalization, climate change, and demographic changes combined with constraints on public spending.
- Societal challenges are integrated into Nordic innovation policies. The focus is on sustainable solutions within green growth and welfare.
- The approach to innovation is changing throughout the Nordic countries. The tendency is more open and broad-based innovation that focuses on demand and engages the public sector.
- User-driven innovation is present in policies in all Nordic countries but with somewhat modest effect due to limited degrees of implementation and concrete measures. A focus on the user is seen to ensure a demand-orientated approach to innovation.

National innovation approaches:

- Innovation in Iceland is primarily research-driven with funding provided through a competitive funding system. User-driven approaches to innovation are mentioned in policies, and the public sector is engaged in innovation through ecological procurement.
- Sweden has a rather traditional and research-driven approach to innovation that emphasises public research through universities and university colleges (högskolor). But newly developed efforts open up a more holistic and challenge-driven approach to innovation with an actively engaged public sector.
- Innovation entered the political agenda the latest in Denmark. Danish innovation policies have embraced some elements of open innovation and focus on framework conditions for businesses. Even so, technology and science are still prioritized. User involvement has been part of the Danish strategy for several years and is now moving towards an increased focus on PPP and public procurement.
- Norway is moving towards a more open approach where innovation is stimulated by a more engaged public sector. Design plays an important role in innovation efforts with participation of actors at multiple levels with the goal of establishing a “creative society.”
- The Finnish national innovation strategy further develops the country’s position as an innovation frontrunner. The strategy announces a shift towards an approach to innovation that is systemic and broad-based. Finland is now working to implement the new approach through a demand- and user-driven innovation action plan.

International innovation trends:

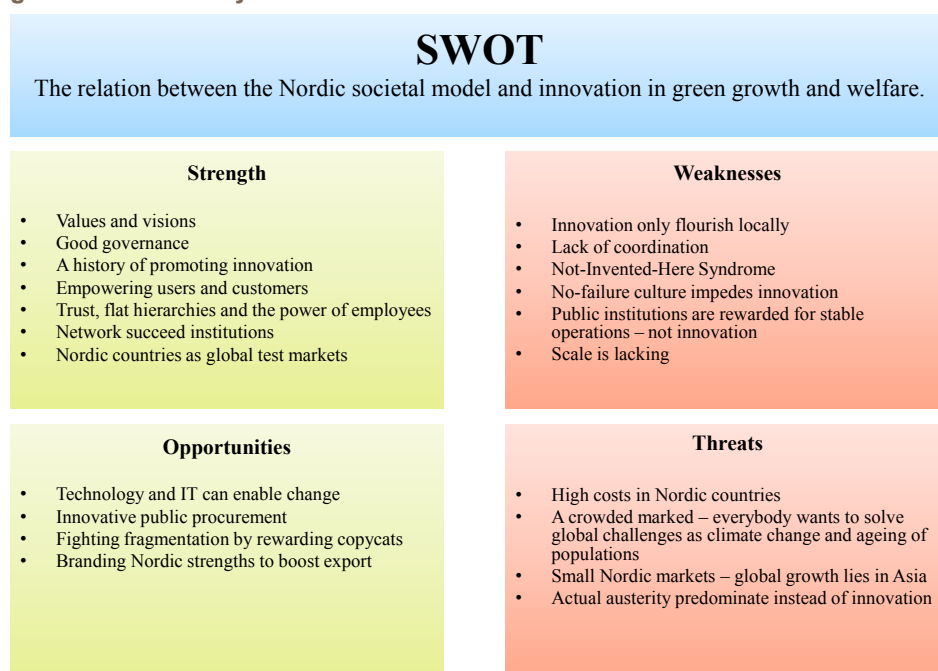
- The EU and OECD presented new innovation strategies in 2010. Both point toward a broadening of the innovation scope beyond a narrow focus on R&D and a wish to connect innovation policies to major societal challenges – notably climate changes, health and ageing populations.
- The strategies of Germany, The Netherlands, Korea and Japan stress the need for linking innovation policies with societal challenges. The countries face diverse challenges, but they share a focus on two areas: green growth and welfare. Regarding green growth, the challenge is generally labelled as a need to innovate on technologies that reduce carbon emissions and increase energy efficiency. On welfare, the challenge is mainly related to health and ageing, but with a focus on technological and scientific innovation.
- Compared to international competitors, the Nordic countries are leaders in innovation that encompasses all sectors of society, with innovative capabilities on all levels. Especially in the field of user-driven innovation and engagement of the public sector, Nordic countries stand out in our mapping of international trends.

SWOT analysis

Our mapping of innovation strategies identifies three major drivers for innovation that are repeated by governments in all of the Nordic countries: globalization, climate changes, and ageing populations. This suggests that the approach to innovation in the Nordic countries is on a path towards common objectives and problems.

Our SWOT analysis of the relationship between the public sector and innovation within green growth and welfare gives a deeper picture of how to move forward with innovation policies and initiatives in the Nordic countries.

Figure 2: SWOT analysis



1. Introduction: New Nordic Innovation – Pioneering Sustainability

This is a report on how the Nordic countries can catalyze innovation in order to reinvent the Nordic model – making it a more sustainable role model towards global challenges. A more sustainable role model because it is based on sustainability in three dimensions: Environmental, social and economic sustainability – and the linkages between the three.

Table 1.1 Sustainability

The three challenges of sustainable development. These are the areas where society demands radical innovations:

- Economic challenges: competitiveness, financial stability, growth, employment
- Environmental challenges: climate change, pollution, water supply, waste, etc.
- Social challenges: ageing, lifestyle diseases, social exclusion

The New Nordic Welfare Model would not only be the role model for welfare *states*, but for welfare *societies*. Societies having a more open approach to innovation that involves users, focuses on demand and secure sustainable public procurement, where the public sector catalyzes partnerships with companies, citizens and organizations, and adds societal and environmental dimensions to innovation. In short: New Nordic Innovation.

The report takes stock of the particular assets and limitations of the Nordic societies to make innovation policy become a driver for green growth and better welfare in an ever more globalized world. The overall aim of the report is to pinpoint the possibilities of the Nordic countries in order to become frontrunners in fostering sustainable solutions to the major global climate, environmental and social challenges. Not only is the report about innovation in green growth and welfare respectively, it is also about how innovation policy can foster and promote synergies *between* green growth and welfare. In other words it is about finding methods and policies that connect the social, environmental and economic challenges of sustainable development.

Table 1.2 Definitions

We define:

- **Innovation** as ideas that are implemented and create value
- **Welfare** as social services provided by the state or other organizations for the wellbeing of citizens.
- **Green growth** as environmentally sustainable economic progress

By means of 1) a thorough mapping of trends in national innovation strategies in the Nordic countries; 2) a mapping of international innovation trends; 3) a selection of best practices from all over the Nordic countries; and 4) a SWOT analysis on the basis of the mappings and interviews with key stakeholders and innovation experts from all Nordic countries we finally propose a manifesto of recommendations for a Nordic platform for innovation policy makers in order to move towards a New Nordic Innovation policy.

Global Demand for Sustainable Solutions

Our mapping of innovation trends in the Nordic countries, where green growth and welfare take centre stage, shows that approaches to innovation are changing. But even more dramatic change is needed. As meanwhile, the world is changing dramatically.

We are witnessing almost unprecedented economic, environmental and political turmoil worldwide – from unstable stock markets, a eurozone crisis, Arabian revolutions, America's obesity epidemic and debt challenge to sensitive discussions on energy production following the nuclear disaster in Fukushima. Irreversible environmental damage continues, while carbon emissions are at an all-time high – despite economic crisis.

Global attention is still more focused on how to develop sustainable solutions as an answer to well-known challenges within welfare and green growth. Our mapping shows that global innovation leaders such as Germany, the Netherlands, Korea and Japan focus on challenges from climate change and resource constraints, whilst innovation in welfare responds to challenges within a variety of issues ranging from the ageing of populations, the epidemic spread of diseases related to lifestyle to a more generalized question of how to develop a new relation between the public sector and citizens' growing wants and needs.

The challenges are global, and not only Nordic. Therefore the potential market demand for solutions is of a very big scale (See Figure 1), and the starting point in the global quest to find sustainable solutions is good for the Nordic countries.

Environmental Sustainability – a part of Nordic thinking

The concept of sustainability is forever linked to the Nordic countries through the visionary work of Gro Harlem Brundtland, once a Norwegian prime minister. In the late 1980s, she chaired the UN commission *Our Common Future*, resulting in the so-called Brundtland Report. Here we find the now-famous definition of sustainability, moving the concept from the fringe of the discussions of environmental circles to the centre of attention in world politics. Thereafter sustainability was understood as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”⁽¹⁾.

As simple as it seems at first glance, it is demanding to live out because the needed solutions imply radical changes in society as we know it. This underlines the need for innovative capabilities that the Nordic countries have a remarkable record in demonstrating.

Sustainability as a concept has found its way into most parts of society, notably in the discussion of welfare, and not least in the public economy.

(1) The World Commission on Environment and Development (1987): *Our Common...*

Economic sustainability – resilience in time of crisis

Looking at the economy during the crisis, it has become increasingly obvious that sustainability also has an economic dimension. Denmark, Finland, Norway and Sweden have proven to be sustainable economies and much more resilient to the financial crisis than most other nations. They have triple-A ratings from key credit rating agencies, and are rewarded with stable interest rates, which are substantially lower than the EU average (See Figure 2).

This has not always been the case. Each of the five Nordic countries has experienced severe economic backlashes in recent decades. Once, a famous Danish finance minister remarked that Denmark was on the brink of an abyss, with unemployment, rates of interest and public deficit measured in double digits. Norway, Sweden and recently Iceland have been forced to nationalize banks, and Finland once encountered record high unemployment of around 20 per cent.

The need for a sustainable footing of the economy has been learned the hard way through reforms. The turmoil has proven the remarkable capability of the Nordic countries, and not least the Nordic people, to rise to and meet challenges, even if it demands them to fight established, vested rights. That the Icelandic people are well on their way towards restructuring their society, domestically and internationally, only a few years after a devastating financial crisis is an example of the ability and willingness to turn risks into opportunities. Apart from a very few exceptions, political parties across the spectrum support sustainable public finances in the Nordic countries.

Social sustainability – the middle way

Nordic citizens have created some of the wealthiest, happiest and most competitive and equitable countries in the world. In many international rankings, Nordic countries compete with each other for a position at the top. One example is a meta-index covering as diverse aspects as competitiveness, democracy, environmental sustainability, gender equality and happiness, where the five Nordic countries occupy positions one through five⁽²⁾. Furthermore, Nordic capitals usually compete in the top five of the world's most liveable cities.

Nordic countries have impressed the world for decades. Now it is time to repeat that success in the 21st century. Here, the latest analysis of innovation in European countries is a good base: positions one through three are occupied by Nordic countries (See Figure 3).

And Nordic countries invest in the future as do few other countries. Even during the financial crisis, they have not retreated from investments in research and development. As early as 2009, over a decade before the 2020 target, four of the Nordic countries, Denmark, Finland, Iceland and Sweden, met the European goal of using 3 pct. of annual GDP on research and development (See Figure 4).

Regarding welfare, the Nordic countries have become a global role model. It goes back as far as the 1930s, when American journalist Marquis Child wrote his now-famous analysis of Sweden, *The Middle Way*. In the then-polarized world, he argued, Sweden had built a model society, which he regarded as a hitherto untried path between the two extremes of the time, the United States and the Soviet Union. Today the Nordic welfare model has served as a

(2) Tällberg Foundation (2010): Tällberg Global...

benchmark for reforming the European social models being a model capable of aligning social equity and economic efficiency.

Most recently, in a report about innovation within health care delivered to the Norwegian government, economist Kaare Hagen characterizes the development of the Nordic model of welfare as a major innovation in the development of societies⁽³⁾. In this model, society itself has to be sustainable – when talking about care, equality and health.

New concept of innovation needed

Despite the Nordic advantages, there is a need for big leaps forward in innovation to create sustainable societies. Traditionally, the three elements of sustainability – the social, economic and environmental – have broadly speaking been disconnected forming three separate political agendas (see Figure 5). The issue of social sustainability has obviously been related to the social services of the welfare states, and the environmental issue have mainly concerned how to protect the environment and climate through various regulations.

Finally, innovation policies have been restricted to the issue of economic sustainability – i.e. basically the question of how to stimulate and foster competitive industries and companies within the country. Therefore innovation strategies have focused on supplying and supporting industries with new technologies through investments in research and development, promoting entrepreneurship and facilitating export.

Meanwhile our SWOT analysis of innovation within green growth and welfare shows that even though innovation flourishes in all five Nordic countries, no country excels in using the gained knowledge from projects and initiatives on a national scale. It is rare that experience from innovative projects is spread to users in similar situations and it is even rarer that welfare and green growth are combined.

The years to come will be characterized by a still-more competitive global environment, where countries and companies rush to deliver solutions to especially those problems the Nordic countries want to solve.

Throughout the world, there is a common understanding of the challenges to be met. Advanced countries within OECD all identify climate changes, environmental problems such as resource scarcity and the societal problems connected with ageing as the most urgent drivers for innovation.

In Europe, the discussion of sustainability has taken root not only in the Nordic countries but also in neighbouring countries such as Germany and The Netherlands. Just as in the five Nordic countries, they couple the need for innovative solutions with a demand for sustainability.

“Public sector innovation has had a negative wording, because people think of losing jobs and cutting services, but it is really about delivering the policies in a more efficient way and responding to the end needs of the user. Understanding what their needs are and what their experience has been and deliver the service based on that experience,” says Máire Geoghegan-Quinn, EU Commissioner for Research, Innovation & Science.

(3) Norwegian Ministry of Health and Care Services (2011): *Innovasjon i omsorg*. (Innovation in Care).

In this context, the five Nordic countries excel when they open up the process of innovation and include a variety of stakeholders, most notably professionals and users in the development of new solutions. At best, it increases the ability to target needs more precisely through innovation and, because of that, be a success.

By using the public sector to catalyze innovation within green growth and welfare, the Nordic countries can put themselves in a good position relative to other European and international competitors. Simultaneously, there is a need for innovation to cover society – citizens, companies and public institutions are all partners in new innovative processes (See Figure 6). And when covers the whole of society innovation concurrently needs to cover not only technology but also ‘soft’ aspects such as services, models, concepts and organization.

“We have a tradition of involving citizens and users when developing our services. We even regard it as a precondition for success with innovation,” says Dorte Dalgaard, project manager, The Region of Southern Denmark.

The fast-rising number of citizens with chronic diseases is one example where innovation is in need because chronic patients per definition cannot expect a medical or surgical cure (See Figure 7). If chronic patients are to have a better life, they have to take better care of themselves. When we expect to live longer, the need to adjust behaviour to the needs of a prolonged life becomes ever-more important. Some of the needed actions are mostly a question of habits, such as the need to exercise more and skip the worst calories. Other parts of the solution are to invent new technology, or use existing technologies in new ways, in cooperation with institutions, companies, specialists and patients.

One example is the Swedish company Zenicor Medical Systems AB, which has developed a small, easy-to-use sensor, making it possible for elderly patients to monitor heart arrhythmia. Patients and professionals have participated in the development.

“Ideas Clinics” in Norway and Sweden also report success stories involving stakeholders in the innovation process. “I see a fantastic desire to innovate,” Helena Tillborg notes. She is project manager, Teknopol, a public advisor for companies involved in innovation.

As patients are in focus when developing welfare technology, we must find citizens in the same place when discussing green growth.

Today, some of the main sources of CO₂ emissions come from our cars, our food and our houses. And in this dimension, the Nordic countries do not excel – yet. If the Nordic countries are to address climate problems, it will be a combination of sustainability and radical innovation that severs the connection between wealth and CO₂ emissions (See Figure 8).

A common denominator for the problems highlighted above is that solutions have consequences for the individual, for companies, for institutions – indeed, for society as a whole. They relate to new definitions of the common good, where solutions only occasionally will be found in ordinary markets. Societies cannot sit and wait for markets to come up with the much-needed solutions.

New Nordic Model

There is a need for a bridge-builder between the societal problems and the markets where most innovations are created. The mediator is a new Nordic innovation policy that thinks beyond the narrow fields of economic competition and incorporates all three dimensions of sustainability: economic, social and environmental (See Figure 9). A new Nordic innovation policy where the public sector plays a pivotal role in spurring the needed sustainable solutions, in close cooperation with companies, citizens and organizations. The development of a new, innovative culture in the public sector is a precondition for this.

There is a need and an opportunity for reforming the societies that made the Nordic countries world famous. The goal is to develop a new Nordic model, not just a version 2.0 but rather a version 3.0 – a model building on environmental, social and economic sustainability and which importantly connects the three dimensions and catalyze synergies between the three. If we succeed, it will generate enormous opportunities to transform global challenges into sustainable societies.

Past transformations of society – gender equality spearheaded by the Nordic countries, or the rise of information technology – have created enormous opportunities, even if they required massive investment or changes in behaviour or society. The opportunities have not come merely in isolated sectors but for the economy and society as a whole.

This transformation process can only be kick-started by a new approach to innovation that directs its spotlights on green growth and welfare and the possible synergies between the two. New Nordic Innovation must secure sustainable public procurement and a public sector catalyzing public-private partnerships. It must ensure an open approach and user involvement, focus on societal demand and add sustainability in all dimensions to innovation policy.

Figures

Figure 1: Tripling of expenses to care and health
Increase in expenses to care and health, EU27 2009-2040

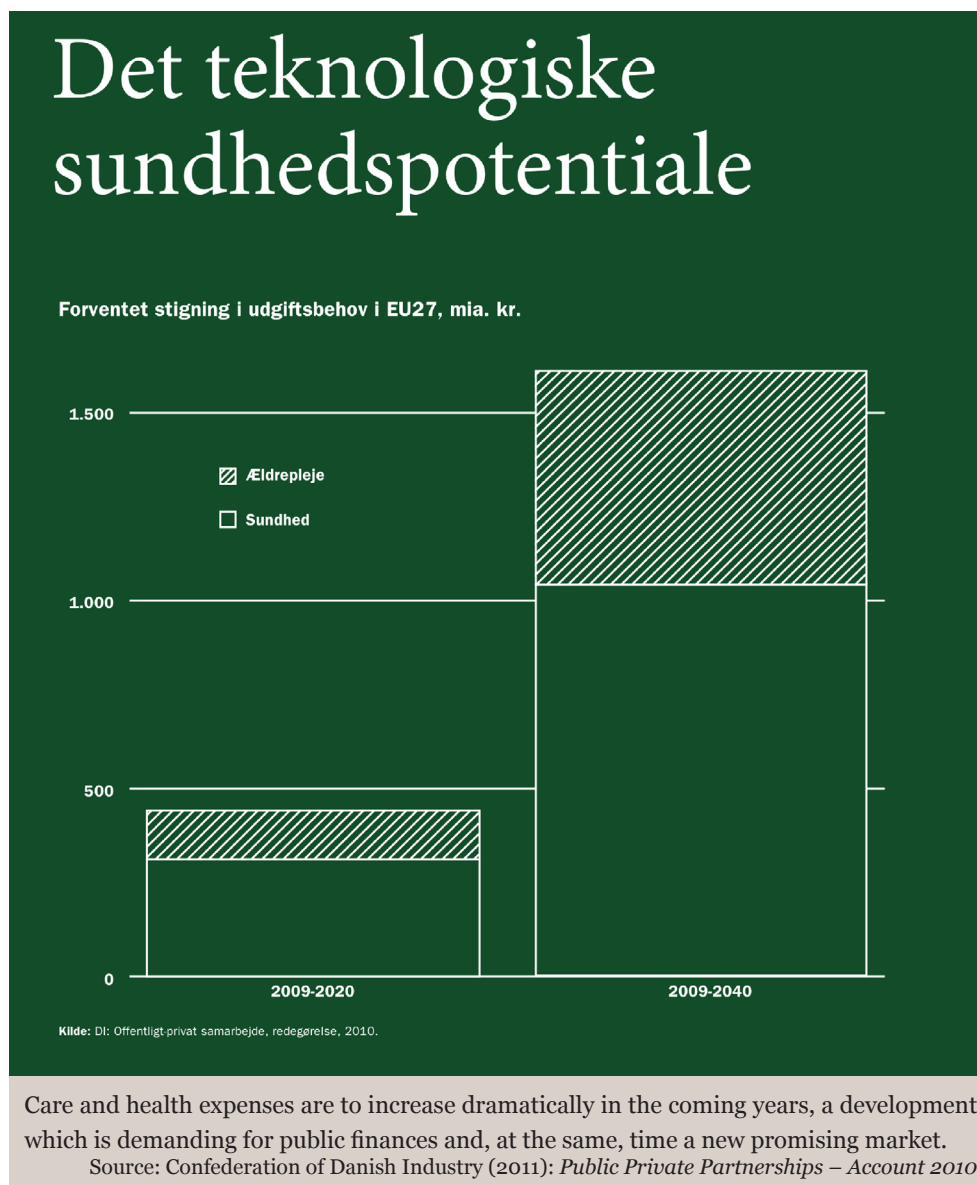
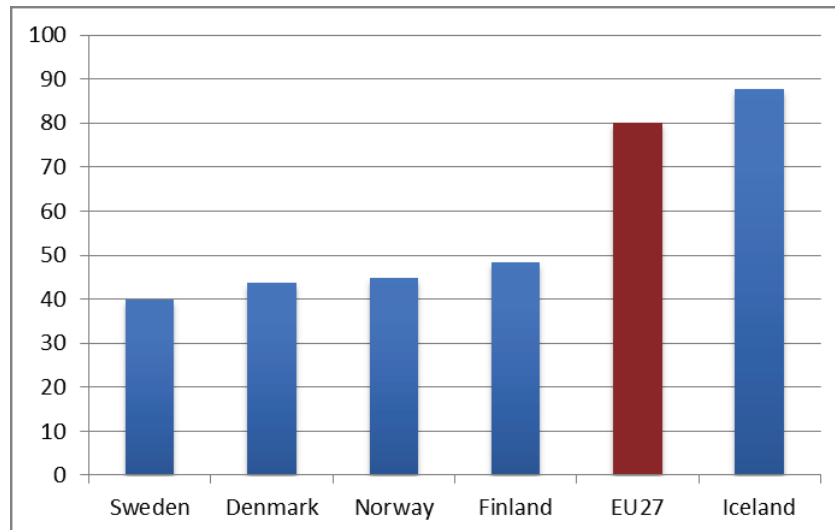


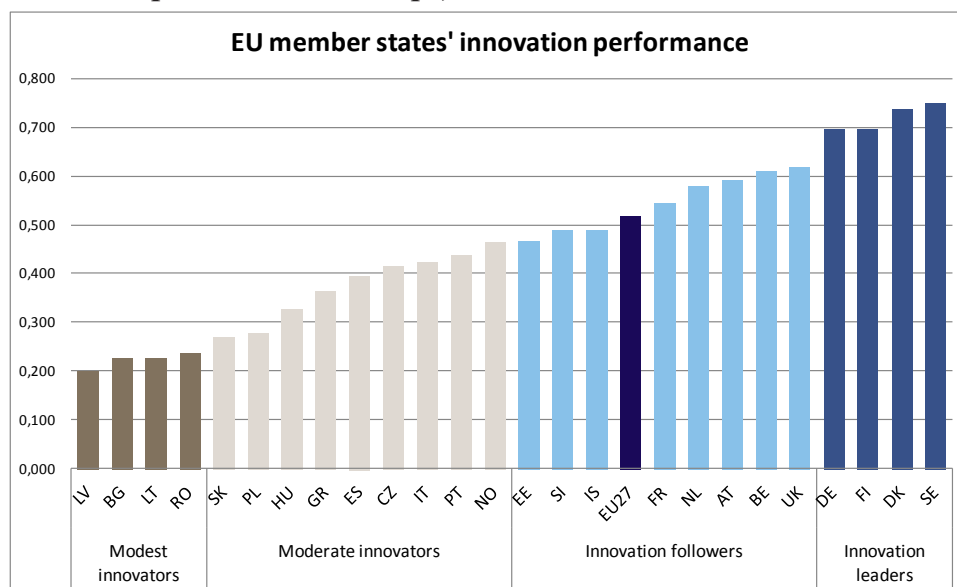
Figure 2: Sustainable economy
Public debt in Nordic countries 2010



Public debt in four of the five Nordic countries is substantially lower than the EU average.

Source: Eurostat: <http://epp.eurostat.ec.europa.eu/>

Figure 3: Innovative Nordics
Innovation performance in Europe, selected countries (2010)



Note: Average performance is measured using a composite indicator building on data for 24 indicators going from a lowest possible performance of 0 to a maximum possible performance of 1. Average performance in 2010 reflects performance in 2008/2009 due to a lag in data availability.

The performance of Innovation leaders is 20% or more above that of the EU27; of Innovation followers it is less than 20% above but more than 10% below that of the EU27; of Moderate innovators it is less than 10% below but more than 50% below that of the EU27; and for Modest innovators it is below 50% that of the EU27.

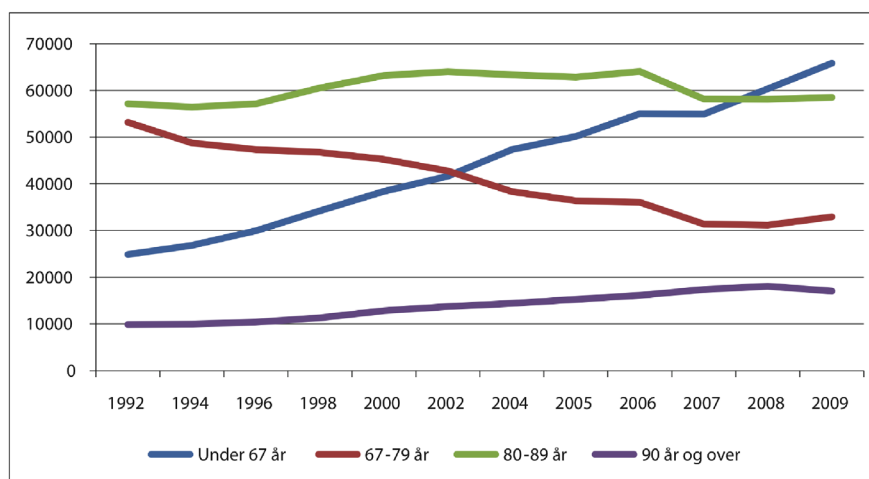
The Innovation Union's performance scoreboard for Research and Innovation

Source: European Commission (2011): *Innovation Union Scoreboard 2010*

Figure 4: Dramatic increase in help to youngest citizens
Subhead: Citizens receiving care at home, Norway 1992 - 2009

24
 Kapittel 3

NOU 2011: 11
 Innovasjon i omsorg



Figur 3.1 Antall mottakere av hjemmetjenester, etter alder. 1992-2009

Citizens younger than 67 receive still more care at home – belying the notion that age is the only driver of expenses in care.

Source: Norwegian Ministry of Health and Care Services (2011): *Innovasjon i omsorg*. (Innovation in Care)

Figure 5: The three dimensions of sustainability and innovation policy – a traditional view

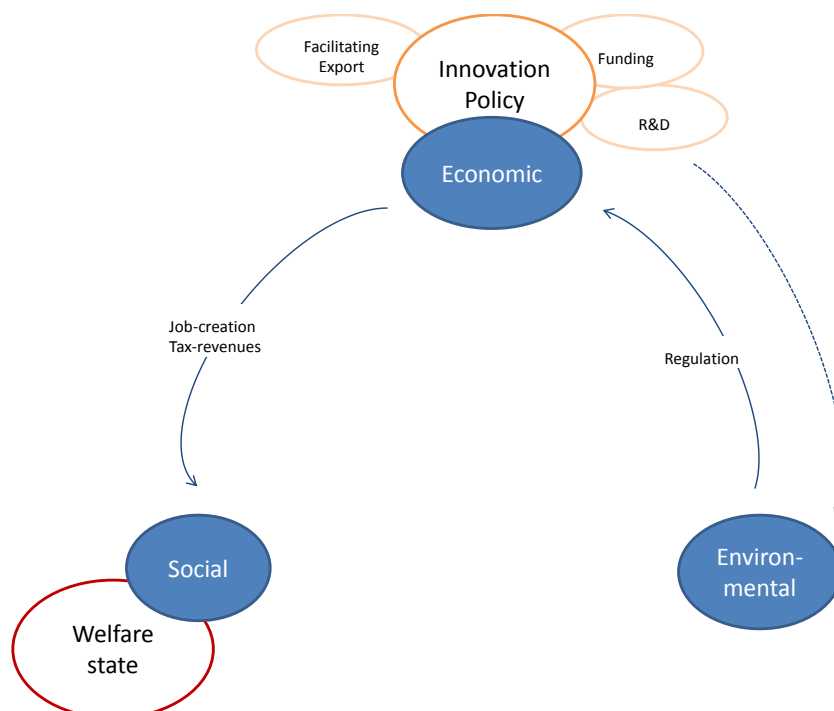
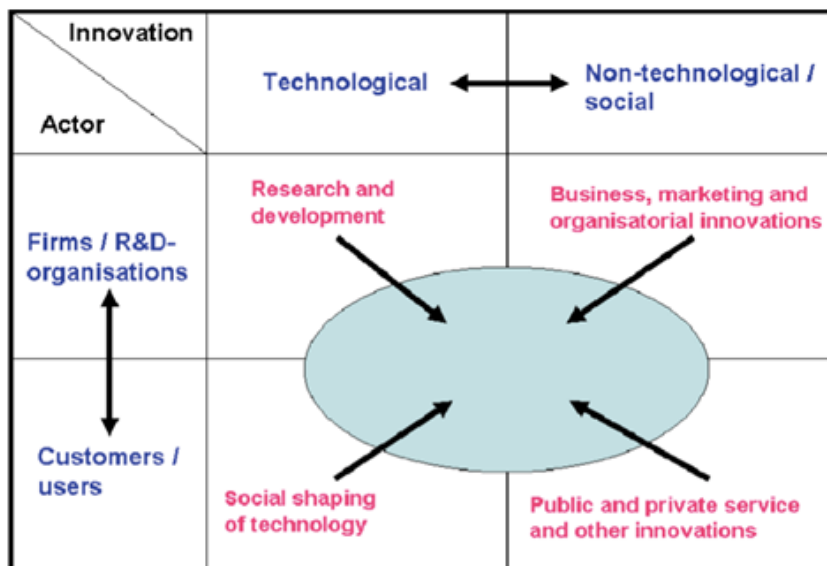
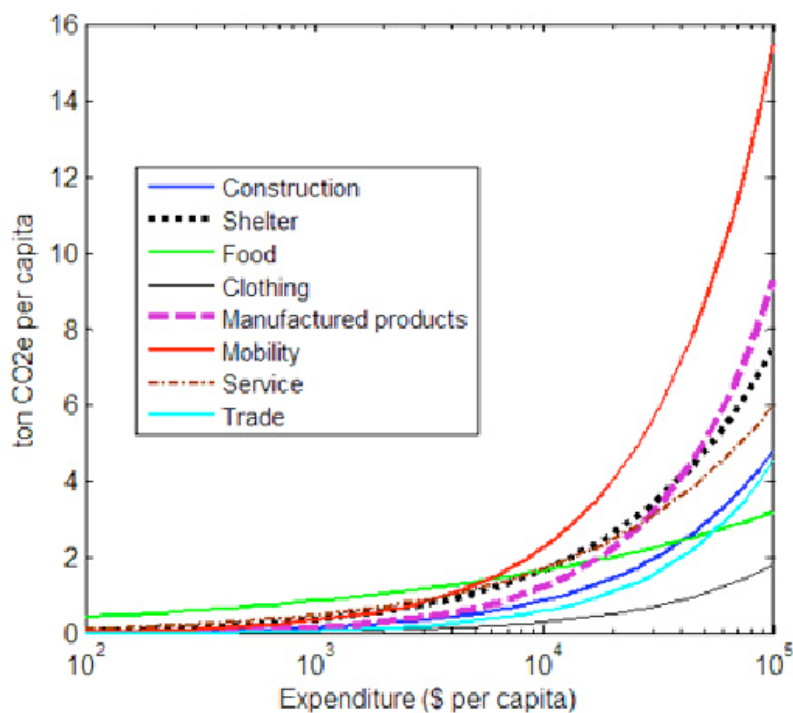


Figure 6: Expanding innovation activities
New interactions between players and functions



Source: Research and Innovation Council of Finland (2008): *Expanding Innovation Activities: New Interactions between Players and Functions – Policy Report 2008*

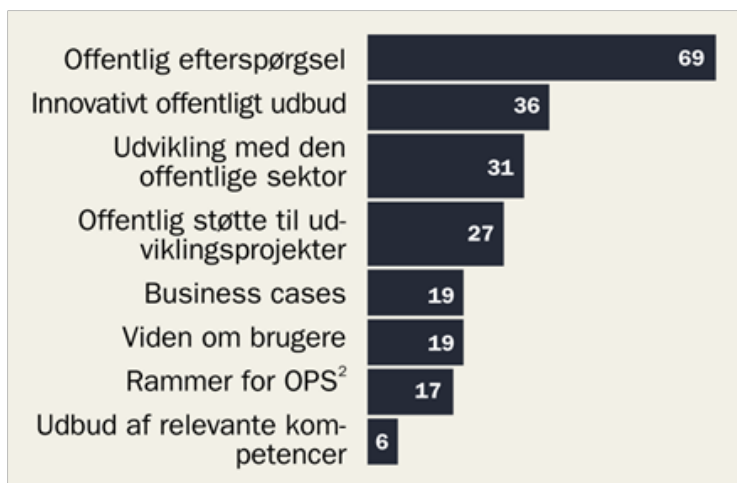
Figure 7: Wealth creates CO₂ emissions
A demanding link between wealth and emissions



Carbon footprint of different consumption categories as a function of expenditure level

Norwegian University of Science and Technology, Carbon Footprint of Nations:
<http://www.carbonfootprintofnations.com/>

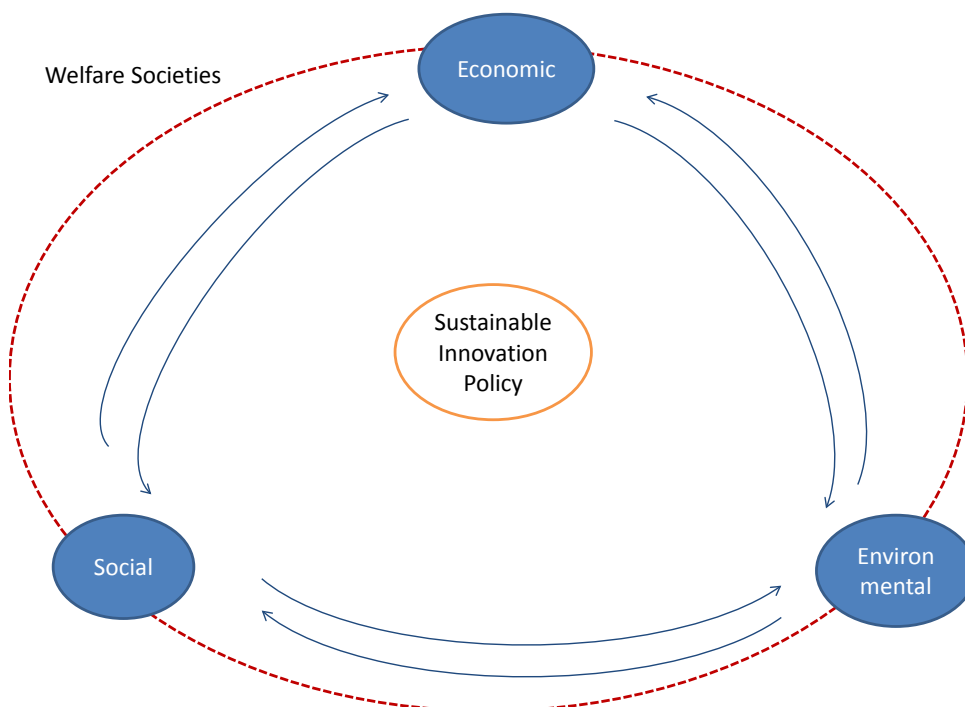
Figure 8: Importance of public demand
Factors that spur the development of technology in welfare



Companies regard public demand as the most important driver behind the development of welfare technology.

Source: Damvad (2010): Kortlægning af virksomheder, der producerer velfærdsteknologi og service. Report for Region Syddanmark og Odense kommune

Figure 9: New Nordic Innovation



2. Innovation Policy Trends in the Nordic Countries

Throughout the Nordic countries, approaches to innovation policy are changing. The Nordic countries approach innovation differently, but an analysis of recent trends in national innovation strategies indicates they are aligning towards the same objectives and embracing similar approaches. Our mapping of Nordic innovation strategies identifies two recurring trends: 1) integrating the major societal challenges related to green growth and welfare into innovation strategies; and 2) embracing more open and broad-based approaches to innovation focusing not only on science and technology but service innovation, user-involvement, design-thinking, and public sector demand, too.

Innovation in green growth and welfare – a way to deal with major societal challenges and global competition

Nordic governments all point to the same three societal challenges as drivers for innovation: globalization, climate changes, and an ageing population (the latter not being as relevant in Iceland). First, globalization is seen as a challenge, as it involves growing competition from abroad. However all the Nordic countries emphasize, and are confident about, the opportunities globalization concurrently generates. In the areas of green growth and welfare especially, the Nordic countries see opportunities for innovation and market shares in the global economy. Second, on climate changes, all Nordic countries agree there is a growing demand for green sustainable solutions, and that Nordic countries have significant competitive advantages in this area (though very different from country to country). Third, demographic changes combined with constraints on public spending are seen as major drivers for welfare and public sector innovation. Furthermore, the economic crisis, which surface after most of the Nordic national strategies were launched, has illustrated the need to rethink and innovate. In the years to come, our research and interviews find, economic constraints will be the main driver for innovation within the public sector.

Meanwhile, though the national Nordic innovation policies are heterogeneous and based on very different understandings of and approaches to innovation, the drivers identified in all Nordic countries seem to be aligning towards common objectives and problems. First, the challenge of ageing has placed welfare on the innovation policy agenda in every Nordic country. Second, there is political will in all Nordic countries to direct innovation capacities towards tackling the challenges of climate and environment. In sum, there is political will to bring together the three dimensions of sustainability – economic, environmental and social. Despite political focus on sustainability, we still see little effort to promote synergies, especially between the environmental and social dimension. However, the selected best practices (See Chapter 4) provide some possible pathways towards combining the three dimensions of sustainability.

Nordic countries moving towards user-orientation and open innovation

The focus on demand-driven innovation has stimulated a parallel debate on how to facilitate innovation processes as such. Demand-driven innovation within green growth and welfare seem to call for new approaches to innovation policy.

The realization that innovation policy needs to open up for innovation in larger parts of society, with an increased focus on users, is now more apparent than ever. These initiatives are better capable of defining and visualizing the demands of society and its inhabitants. First, we see a political will to give the user a much more prominent role in the innovation process. User-driven innovation is mentioned in strategies of all the Nordic countries, but differences remain in the degree of implementation and measures taken to enhance the user's role in the process of innovation. If Nordic governments deliver on their words, user-driven innovation will be an area of great activity in the years to come.

Finland and Denmark have been first-movers on implementation of user-driven innovation policies. Denmark has experimented with user-driven innovation for more than five years and today has a fairly institutionalized system – despite the fact that the “Program for User-driven Innovation” was cancelled after three years. In Finland, an action plan on user-driven and demand-focused innovation was presented in 2010. The remaining Nordic countries have their own user-driven innovation programmes, such as Sweden's Living Labs and Norway's Design programme, and they are all committed to engage more in field.

Second, we see a broadening of the role of the public sector in stimulating innovations, supplementing the focus on science and technology with other perspectives. For instance, all Nordic countries have set up strategies to stimulate innovation through public procurement. The idea being that great potential exists for public sectors to demand solutions to specific societal needs instead of predetermined products. The focus is rather new, so initiatives are mostly experimental. Notable are Iceland's strategy for Ecological Procurement and the Norwegian programme for supplier development.

Finally, though not a general tendency, the importance and opportunities of “soft” innovation seem to be recognized as well. Innovations are not exclusively seen as technological but also new systems, concepts, services, and models.

Innovation high on the political agenda

Innovation is high on the political agenda in all the Nordic countries. In 2011, two governmental platforms were presented in Finland and Denmark. Both included sections on innovation policy, with promises to further development existing policies. In Iceland, the government's central strategy document, Iceland 2020, presents innovation as a key tool in achieving a dynamic society founded on welfare, knowledge and sustainability within the next ten years. In Sweden, a new national innovation strategy is due to be released in 2012, and is now in public hearing.

Conclusions from our Nordic mapping

- Three overriding drivers for innovation stand out in innovation strategies and documents in the Nordic countries: globalization, climate change, and demographic changes combined with constraints on public spending.
- Societal challenges are integrated into Nordic innovation policies. The focus is on sustainable solutions within green growth and welfare.
- The approach to innovation is changing throughout the Nordic countries. The tendency is more open and broad-based innovation that focuses on demand and engages the public sector.
- User-driven innovation is present in policies in all Nordic countries but with somewhat modest effect due to limited degrees of implementation and concrete measures. A focus on the user is seen to ensure a demand-orientated approach to innovation.

Summary of national innovation trends

- Innovation in Iceland is primarily research-driven with funding provided through a competitive funding system. User-driven approaches to innovation are mentioned in policies, and the public sector is engaged in innovation through ecological procurement.
- Sweden has a rather traditional and research-driven approach to innovation that emphasises public research through universities and university colleges (högskolor). But newly developed efforts open up a more holistic and challenge-driven approach to innovation with an actively engaged public sector.
- Innovation entered the political agenda the latest in Denmark. Danish innovation policies have embraced some elements of open innovation and focus on framework conditions for businesses. Even so, technology and science are still prioritized. User involvement has been part of the Danish strategy for several years and is now moving towards an increased focus on PPP and public procurement.
- Norway is moving towards a more open approach where innovation is stimulated by a more engaged public sector. Design plays an important role in innovation efforts with participation of actors at multiple levels with the goal of establishing a “creative society.”
- The Finnish national innovation strategy further develops the country’s position as an innovation frontrunner. The strategy announces a shift towards an approach to innovation that is systemic and broad-based. Finland is now working to implement the new approach through a demand- and user-driven innovation action plan.

A FEW REMARKS ON METHOD

Our mapping of Nordic innovation policy trends is based on document analysis of national strategies – if present – and policy documents and external evaluations of national innovation policies (e.g. from OECD and EU). The documents have been searched for themes such as: innovation vision, societal challenges and drivers, new approaches (open, user-driven, employee-driven, network-based, holistic, social, procurement, public sector, etc.), and finally linkages between innovation policy and green growth and welfare. The mapping also rests on inputs from key actors on innovation in the Nordic countries.

Finland

Innovation strategy: solving the world's wicked problems

In 2009, Finland became the first Nordic country to develop a national innovation strategy⁽⁴⁾. For more than a decade, Finland had been a global innovation frontrunner, and the strategy further strengthened that position. According to the national branding strategy, this is no coincidence: Innovation is part of the Finns' DNA and they have the ability to solve "the world's wicked problems"⁽⁵⁾.

"The experimental society" is the Finnish vision for innovation. The goal of the innovation strategy is to improve the well-established, competence-based innovation policy of Finland. Until 2009, innovation was seen mostly as R&D and technology in collaboration between businesses and research institutions. The national innovation strategy presented a more systemic approach, with a demand- and user-based innovation approach that highlights the role of competition and innovation in an open world⁽⁶⁾.

According to the national innovation strategy, Finland is facing immense changes that involve both social and economic challenges. Four drivers of innovation are spelled out in relation to these challenges: globalization, sustainable development, new technology, and an aging population. At least two of the drivers relate to innovation within green growth and welfare⁽⁷⁾.

Innovation trend: demand- and user-driven

The 2009 strategy presents a shift to what is labelled a systemic and broad-based approach to innovation⁽⁸⁾. This new approach opens up to involvement of more sectors of society and activities at multiple levels⁽⁹⁾.

The implementation of the "soft innovation" aspects of the strategy is to a large extent laid out in the 2010 *Framework and Action Plan on Demand and User-driven Innovation*. The action plan announces a number of initiatives designed to enhance demand- and user-driven innovation through more efficient public procurement, making information about the public sector more accessible and an increased focus on design⁽¹⁰⁾.

The primary actor implementing the new innovation approach is the large governmental agency, Finnish Funding Agency for Technology and Innovation (Tekes). Annually Tekes grants around EUR 600 million towards innovative projects and around 40 pct. is provided for customer initiatives based on demand⁽¹¹⁾. In its framework and action plan, Tekes is asked to work towards new ways of making Finland's innovation programmes more in line with solving key societal challenges and stimulate demand- and user-driven innovation⁽¹²⁾.

(4) Government of Finland (2009): Government's Communication...

(5) Country Brand Delegation (2010): Mission for...

(6) Gjoksi (2011): Innovation and...

(7) Government of Finland (2009): Government's Communication...

(8) Government of Finland (2009): Government's Communication...

(9) Gjoksi (2011): Innovation and...

(10) Finnish Ministry of Employment and the Economy (2010): Demand and...

(11) Tekes (2011): Tekes strategy...

(12) Finnish Ministry of Employment and the Economy (2010): Demand and...; Rosted, Jørgen and Anne Dorthe Jos-siasen (2010): Intelligent offentlig...

A way of opening up innovation for multiple societal sectors is the – Tekes and the Academy of Finland co-funded – “Strategic Centres for Science Technology and Innovation” (SHOKs) that stimulate innovation by involving different sectors of industry and society. One of these centres is the “Built Environment Innovation” (RYM Ltd.) that works to enhance sustainability with a user- and customer-oriented approach “facilitating improvement of people’s health and well-being”⁽¹³⁾. Another is the SHOK for Health and Well-being (SalWe Ltd.), which focuses on functional capabilities and on prevention and treatment of diseases with major public health and economic impact⁽¹⁴⁾.

Finnish Innovation Fund, SITRA, is another of the key actors in Finnish innovation efforts. Among other projects, they initiated the Helsinki Design Lab, which uses strategic design to propose solutions on key societal challenges⁽¹⁵⁾.

Efforts are also under way at the regional level. The Helsinki-based regional knowledge centre Culminatum Innovation has initiated a project on pre-commercial procurement⁽¹⁶⁾.

Though comprehensive in an international comparison, the Finnish innovation strategy has been criticized for lacking concrete measures to shift innovation away from a narrow focus on technology and science. It is argued that the increasing amount of funding funnelled through Tekes makes a transition to more demand-driven innovation difficult⁽¹⁷⁾.

Green growth and welfare

The strategic premise for Finland’s national innovation strategy is that innovation is a means to support economic growth by “fostering sustainable socio-economic reform, and enhancing the wellbeing of citizens and the environment”⁽¹⁸⁾. In this way, the innovation potential for both welfare and green growth is recognized⁽¹⁹⁾.

Furthermore, the policy for demand- and user-driven innovation highlights how a shift in the approach of innovation is linked to issues of green growth and welfare: “During the last few years, innovation activity has become significantly more multidimensional, which can be viewed as representing a rather fundamental change. (...) innovation activity will provide answers to many significant societal answers such as sustaining well-being, curbing climate change and energy consumption”⁽²⁰⁾.

In the 2010 framework and action plan, welfare services are mentioned as an example where innovation can be achieved through user-driven flexible partnerships⁽²¹⁾. The framework and action plan also announces that environmental objectives are part of innovation policies with key efforts such as tax incentives, regulation, and public procurement⁽²²⁾.

(13) RYM Ltd.: <http://www.rym.fi/en/>

(14) SalWe Ltd.: <http://www.salwe.org/>

(15) Helsinki Design Lab: <http://www.helsinkidesignlab.org/>

(16) Culminatum Innovation: <http://www.culminatum.fi/en>

(17) Gjoksi (2011): Innovation and...

(18) Government of Finland (2009): Government’s Communication...

(19) Government of Finland (2009): Government’s Communication...

(20) Finnish Ministry of Employment and the Economy (2010): Demand and User-driven Innovation Policy...

(21) Finnish Ministry of Employment and the Economy (2010): Demand and...

(22) Finnish Ministry of Employment and the Economy (2010): Demand and...

Tekes has three focus areas, which all relate to innovation in green growth and welfare: natural resources and sustainable economy, vitality of people, and intelligent environments⁽²³⁾. Tekes' Sustainable Community programme creates business activities in designing, constructing and maintaining sustainable buildings. The Electrical Vehicle Systems programme stimulates development platforms for machines on and off the road. The Green Growth programme works to create production and service networks that consume less natural resources⁽²⁴⁾.

Since 2000, Tekes has worked extensively with innovation in health care through the iWell (2000-2004) and FinnWell (2004-2009) programmes. In order for Tekes to focus more on customer-driven development of service production, Tekes launched the Social and Health Care Services programme (2008-2015). The funding of the programme amounts to approximately EUR 240 million, of which the share of Tekes is about EUR 120 million.⁽²⁵⁾

KEY PUBLIC ACTORS

- The Ministry of Employment and the Economy: oversees Finland's technology and innovation policy.
- The Ministry of Education and Culture: responsible for the country's education and science policy.
- The Research and Innovation Council: coordinates efforts on research and innovation, prepares the main lines for Finnish research and innovation policy chaired by the Prime Minister.
- Tekes – The Finnish Funding Agency for Technology and Innovation: Executes national innovation policies and distributes funding.
- The Academy of Finland: national research council.
- The Finnish Innovation Fund (SITRA): An independent public foundation under auspices of parliament that works to develop and implement new operating models on innovation through practical implementation and experimentation.

(23) Tekes (2011): Tekes strategy...

(24) Tekes: www.tekes.fi

(25) Tekes: www.tekes.fi

Iceland

Innovation strategy: research and competitive funding

The Icelandic policies on innovation share a focus on research-driven innovation and enhancing knowledge transfer from research into industry and society⁽²⁶⁾. The two main policy documents are *Iceland 2020*⁽²⁷⁾, published by the Prime Minister's Office, and *Building on Solid Foundations*⁽²⁸⁾, published by the Science and Technology Policy Council (STPC). The latter summarises innovation in Iceland thus: "Increased support to research-driven innovation and interdisciplinary cooperation between the private and public sectors at national and international levels provides opportunities for increased value creation and sustainable prosperity"⁽²⁹⁾.

The 2008 collapse of the Icelandic bank sector and the subsequent financial crisis affected Icelandic innovation policy, as it did every other sector of society. The financial situation resulted in an explicit focus on stimulating innovation that provides added value for society⁽³⁰⁾. Iceland has overcome its worst financial difficulties, and government spending in research and development was more than €106 million in 2010⁽³¹⁾. According to the STPC, the strategy for Icelandic innovation is to develop "a coordinated approach that involves individuals and institutions from the public and private sectors in an attempt to optimize further development of Icelandic research and innovation"⁽³²⁾.

International cooperation is an important driver for innovation efforts, especially when it comes to research and innovation. Given Iceland's relatively small economy and home market, it is dependent on knowledge cooperation and international investments. About 10 percent of research and development funding in 2009 came from abroad⁽³³⁾.

Competitive funding for businesses plays a significant role in the Icelandic innovation strategy. The Icelandic Centre for Research (RANNIS) operates the public competitive financial support system, which includes the Research Fund, the Fund for Research Equipment, the Student Innovation Fund and the Graduate Research Fund, and the Technology Development Fund. Furthermore, a tax scheme encourages innovation in businesses through tax credits on R&D costs⁽³⁴⁾.

Innovation trend: focus on design and public procurement

Icelandic innovation policies are largely focused on research-driven innovation and cooperation between research institutions and businesses. But soft approaches to innovation are gaining momentum as well. For instance, it is recognized by the STPC that "user-driven innovation calls for new approaches and interdisciplinary cooperation between technical and scientific topics and the creative industries"⁽³⁵⁾.

(26) European Commission (2009): *INNO-Policy...*

(27) Prime Minister's Office (2011): *Iceland 2020...*

(28) Science and Technology Policy Council (2010): *Building on...*

(29) Science and Technology Policy Council (2010): *Building on...*

(30) Prime Minister's Office (2011): *Iceland 2020...*

(31) The Icelandic Centre for Research (2011): *Research &...*

(32) Science and Technology Policy Council (2010): *Building on...*

(33) The Icelandic Centre for Research (2011): *Research &...*

(34) RANNIS: <http://www.rannis.is/english/home/>

(35) Science and Technology Policy Council (2010): *Building on...*

Since 2008, public procurement has been used to stimulate innovation. The aim of the strategy is twofold: first, it reduces the environmental impact of governmental procurement; second, it wishes to improve competitiveness of Icelandic businesses on environmentally friendly solutions. The strategy pushes innovation on green growth by sending “clear signals to the market that these organisations are going to take account of environmental views as well as costs and quality in the procurement. Only in this way will the market be able to react to them and improve supply to meet the new requirements”⁽³⁶⁾. The strategy has thus far had modest effect.

Under the headline “A Better Solution for Less Money”, a new special programme stimulating cooperation between companies and public procurement agencies, ministries and institutions was presented in 2011⁽³⁷⁾.

Green growth and welfare

Traditionally, Icelandic policymakers have not selected certain focus areas when trying to stimulate innovation. Innovation towards specific welfare issues will be central in Icelandic industry and innovation policies, which are due to be published in 2012. Small- and medium-sized enterprises are, though, to a large extent engaged in innovation within issues such as health. This is reflected in Iceland’s expenditures on research and development within business enterprises and organisations where about 25 pct. was related to health in 2009⁽³⁸⁾.

The Icelandic 2020 plan also presents a vision of utilizing innovation in the transition to a green economy. The focus is on eco-innovation, which is defined as “innovation that leads to a better environment, sustainable development and the optimal use of resources throughout their lifespan”⁽³⁹⁾. The above-mentioned strategy on public procurement is one way of achieving green growth through innovation. Furthermore, in September 2011, a report on intensifying the green economy in Iceland was presented to the Althingi. A parliament resolution is now in the making.

(36) Government of Iceland (2009): *Government Policy for Ecological Procurement*

(37) The Icelandic Centre for Research (2011): *Klasasamstarf á þremur...*

(38) The Icelandic Centre for Research (2011): *Research &...*

(39) Prime Minister’s Office (2011): *Iceland 2020...*

KEY PUBLIC ACTORS

- The Ministry of Education, Science and Culture: Responsible for innovation efforts within science and the educational system and administrates the largest part of R&D funding in Iceland.
- The Ministry of Industry, Energy and Tourism: Administrates efforts on innovation and technological development within enterprises and is responsible for The Icelandic Innovation Centre.
- The Ministry of Fisheries and Agriculture: Administrates part of the funding to innovation and research.
- The Science and Technology Policy Council (STPC). Governmental body in charge of the design and coordination of R&D and innovation policy. The Prime Minister sits as chair of the STPC.
- The Icelandic Centre for Research (RANNIS): Supports research, research studies, technical development and innovation in Iceland Operates the public competitive financial support system.
- The Icelandic Innovation Centre: Works to increase innovation, productivity and competitiveness of Icelandic business by doing innovative technology research, diffusing knowledge and giving support to entrepreneurs.

Norway

Innovation strategy: focus on entrepreneurship and technology

The white paper *An Innovative and Sustainable Norway*, from 2008, was the first comprehensive innovation policy document a Norwegian government has published for discussion in the Storting, and is the closest it's come to a comprehensive innovation strategy. The strategy primarily sees innovation as technological. It envisions a "creative society" with creative human beings and undertakings and where authorities "will help to release the creative impulse by offering sound education, research, and adaptation of working life, as well as by working to bring about a culture that encourages creativity and entrepreneurship in society"⁽⁴⁰⁾. The education system should be concentrating on entrepreneurship to "strengthen future generation's attitudes and knowledge of entrepreneurship"⁽⁴¹⁾.

Innovation Norway's strategy for the period of 2009-2013 describes how climate and economic, social and environmental sustainability are the most important challenges. In this period Innovation Norway will trigger sustainable innovations that give rise to greater competitiveness and attractive workplaces throughout the country. Three areas are prioritized; entrepreneurship, business growth and innovation environments within six sectors: Energy and environment, oil and gas, healthcare, agriculture, marine, maritime and tourism.

Innovation Norway's program for public research and development contracts (OFU) has well renowned results for supporting cooperation between public demanding customers and innovative Norwegian companies. Most of this program's funding is normally used on developing new health care solutions. In recent years our cluster programs have accepted several new energy projects. In 2010 we launched a new environmental technology scheme supporting enterprises to start up pilot and demonstration projects, 500 million over three years.

The Norwegian Research Council recently adopted its strategy for innovation 2011-2014⁽⁴²⁾. The strategy emphasizes public sector innovation, innovation through procurement and the will to strengthen focus on competitive Norwegian industries such as energy, marine and maritime sectors. The white paper designates the Norwegian economic sectors with competitive advantages as the marine and maritime sectors, tourism, and services and environmental technologies.

In the white paper, as well as in the innovation strategy of the Norwegian Research Council, globalization is seen as a major driver for innovation, as growing international competition creates opportunities for Norwegian businesses, if they manage to engage in the global knowledge development. In the white paper, Norwegian industries are considered well accustomed to international division of work, and to adapting to the effects of international competition⁽⁴³⁾. Likewise, in the research council strategy, climate changes, rising energy needs, reorganizations in global economy, and an aging population pose challenges but also innovation opportunities for Norwegian businesses, public sector and research institutions⁽⁴⁴⁾.

(40) Norwegian Ministry of Trade and Industry (2008): *An Innovative ...*

(41) Norwegian Ministry of Trade and Industry (2008): *An Innovative ...*

(42) Research Council of Norway (2011): *Forskningsrådets arbeid ...*

(43) Norwegian Ministry of Trade and Industry (2008): *An Innovative ...*

(44) Research Council of Norway (2011): *Forskningsrådets arbeid ...*

Innovation trend: user-centred design and innovative public procurement

Overall, the Norwegian innovation strategy seems to be characterized by two trends. First, there is a rising interest in user-involvement. The white paper adopted a somewhat passive understanding of user-involvement, as it wanted to involve the users in the development of services “through national surveys and measurements of performance achievement”⁽⁴⁵⁾. However, it also wanted to promote a design-oriented innovation thinking which involves more active user-driven innovation. For instance, the government wanted to “strengthen the use of design as an innovation tool by setting up a design-driven innovation programme” (which has led to the initiative “inclusive design” from the Norwegian Design Council⁽⁴⁶⁾) and focus on employees considering new measures for promoting staff-driven innovation in collaboration with the Norwegian Confederation of Trade Unions and the Confederation of Norwegian Business and Industry⁽⁴⁷⁾.

A wish to enhance the user-driven aspect seems central to the innovation strategy of the Norwegian Research Council, as it states that innovation in the public sector involves many actors, but the incentives to involve users in the innovation process are too low⁽⁴⁸⁾.

Second, there is more focus on the role of the public sector. The white paper stated that “the public sector – and not least the healthcare sector – must utilise their resources better by working in more intelligent ways and discovering new solutions through research and innovation. In many cases, innovation in the public sector may contribute to increased wealth creation in industry”⁽⁴⁹⁾.

In this regard, Innovation Norway’s program for public research and development contracts (OFU) has well-documented results of supporting cooperation between demanding public customers and innovative Norwegian companies. Most of the program’s funding is used to develop new health care solutions, but in recent years the cluster programs have accepted several new energy projects. In 2010, a new environmental technology scheme was launched to support start-up pilot and demonstration projects with NKK 500 million in funding over three years.

Innovation is also a major theme in the National Programme for Supplier Development (Nasjonalt program for leverandørutvikling 2010-2015). The five-year program initiated by The Norwegian Association of Local and Regional Authorities (KS) and The Confederation of Norwegian Enterprise (NHO) seeks to stimulate innovation and value through targeted public procurement. The program gathers best practices, initiate pilot projects and offers counselling. The program has two target areas: energy and environment and health and care⁽⁵⁰⁾.

Green growth and welfare: few initiatives but growing political attention

On green growth, one of the focus areas of the white paper on innovation was “environmentally friendly innovations” – promising to allocate more research funds to develop environmental technology by setting up a strategy council for environmental technology and by preparing

(45) Norwegian Ministry of Trade and Industry (2008): *An Innovative ...*

(46) <http://www.inclusivedesign.no/>

(47) Norwegian Ministry of Trade and Industry (2008): *An Innovative ...*

(48) Research Council of Norway (2011): *Forskningsrådets arbeid ...*

(49) Norwegian Ministry of Trade and Industry (2008): *An Innovative ...*

(50) <http://www.leverandorutvikling.no/om-programmet/>

a national strategy for environmental technology⁽⁵¹⁾. This view is also part of the innovation strategy of the Norwegian Research Council, where Norway is seen having a strong position and great growth potential in hydropower, solar energy, and offshore wind power⁽⁵²⁾.

Though it played a minor role in the white paper, welfare innovation is today high on the agenda in Norway. A commission on the future challenges in the care sector was appointed in 2009 by the government (through the white paper) to investigate the possibilities for product and business development and export via public-private partnerships in the care sector, especially developing architecture and new technology. The final report was published in June 2011 and has been widely debated in Norwegian media. It contained various case studies and best practices, as well as proposals to promote and strengthen the agenda on the national and municipal level⁽⁵³⁾.

KEY PUBLIC ACTORS

- Innovation Norway (Innovasjon Norge): state-owned company working through its network of offices in all Norwegian counties and more than 30 countries. It focuses on business-oriented policies.
- The Industrial Development Corporation of Norway (SIVA): network organisation that offers an infrastructure for entrepreneurship and innovation nationwide. It contributes to the development of strong regional and local industrial environments as co-owner of virtually all the science and research parks, incubators and business gardens in the country⁽⁵⁵⁾.
- Norwegian Research Council (Forskningsrådet). Bears overall responsibility for the promotion of basic and applied research within all scientific and technological areas.
- Kunnskapsdugnaden: Cooperation between researchers, businesses and work organisations established in 2006 by the employers' organization (NHO) and trade unions (LO and Tekna) in order to promote a common understanding of knowledge and innovation policy⁽⁵⁶⁾.
- InnoMed: Competence network for need-driven innovation in the health care sector, established in 2007 by Norwegian Directorate of Health on behalf of the Ministry of Health and Care Services. Since 2010, organizer of the Welfare Technology Conference (Velferdsteknologikonferansen)⁽⁵⁷⁾.
- Norwegian Design Council: Promotes design thinking on innovation and works on initiatives about "inclusive design" and "innovation for all"⁽⁵⁸⁾.

(51) Norwegian Ministry of Trade and Industry (2008): *An Innovative ...*

(52) Research Council of Norway (2011): *Forskningsrådets arbeid ...*

(53) Norwegian Ministry of Health and Care Services (2011): *Innovasjon i omsorg*. (Innovation in Care)

(54) European Commission (2009): *INNO-Policy TrendChart, Norway*

(55) <http://www.kunnskapsdugnad.no/>

(56) <http://www.innomed.no/nb/>

(57) <http://www.inclusivedesign.no/>

Denmark

Innovation strategy: fragmented, but soon-to-be changing

Danish innovation policy is a rather fragmented, with multiple programs and foundations supporting a wide scope of initiatives. A common vision, across all institutions, does not exist. In 2008, the acclaimed professor in innovation systems, Bengt Åke Lundvall, thus characterized innovation in Denmark as “activist, opportunistic and ambivalent”⁽⁵⁸⁾.

The fragmented picture is likely to change. In its platform, the newly elected centre-left government of Denmark announced the development of a national innovation strategy to be presented within this electoral period. It finds that countries managing to establish a “new culture of cooperation between the public and the private sector in developing solutions to new global challenges will encourage innovation in both sectors and be better prepared for maintaining welfare in the future”⁽⁵⁹⁾. Within a couple of years, Danish innovation will likely evolve towards a more coordinated effort with the aim of solving key societal challenges.

These challenges are increasingly focused on green growth and welfare, and seen as drivers of innovation. The present innovation policies of Denmark list a number of challenges: an aging population with a decreasing share of the population available in the workforce is one; a globalised economy with heavy competition in productivity is another. That the financial crisis created risk adverse behaviour in companies and in the public sector is also mentioned as a challenge in several policies⁽⁶⁰⁾.

According to the new governmental platform, an overall assessment of drivers is forthcoming. The new Danish government plans to conduct a mapping of the strengths and advantages of Danish innovation. The mapping is to be the basis on which a comprehensive innovation strategy will be developed. A more coordinated effort with a clear vision of the direction of innovation strategy in Denmark is to be expected⁽⁶¹⁾.

From 2009 until March 2011, just before Denmark’s new government was seated, much debate about the direction of Danish innovation policy was conducted in the government’s Growth Forum (Vækstforum). Growth Forum consisted of key representatives from business, interest groups, universities and the government. Its task was to identify, and deliver solutions to, the main challenges facing the Danish economy. In its final recommendations, Growth Forum points to innovation as key to achieving future growth, and need to evaluate Danish innovation efforts. Also emphasised were new solutions in the transition to a fossil fuel-free society, with the aim of enhancing green growth⁽⁶²⁾.

Even though a common vision of innovation is not apparent, several actors have announced visions that relate to innovation. The Danish Agency for Science, Technology and Innovation has presented a vision for Denmark in 2020 where Danish corporations are among the most innovative in the world, providing knowledge and technology that offer answers to the great

(58) Lundvall (2008): *A note on characteristics of and recent trends in National Innovation ...*

(59) Government of Denmark (2011): *Et Danmark...*

(60) Government of Denmark (2010): *Styrket innovation...*; The Danish Council for Technology and Innovation (2010): *InnovationDanmark...*; The Danish Council for Technology and Innovation (2008): *Strategi for styrket...*

(61) Government of Denmark (2011): *Et Danmark...*

(62) Vækstforum (Growth Forum) (2011): *Ny vækst i Danmark – Hovedkonklusioner fra Vækstforum*

challenges of the Danish society⁽⁶³⁾. Likewise, the vision for the public sector is to be one of the most innovative in the world⁽⁶⁴⁾.

Innovation trend: First-mover on users, moving towards PPPs and public procurement

Compared to most of the Nordic countries, the innovation agenda is relatively new in Denmark. The first initiatives, from 2001, focused mostly on better framework conditions for businesses and enhancing entrepreneurship⁽⁶⁵⁾. Perhaps due to the new and rather fragmented position of the national innovation agenda in Denmark, the government was quick to embrace new innovation focuses such as user-driven innovation. Still, most funding is spent on technological and scientific innovation.

An institutionalized effort on user-driven innovation positioned Denmark as a first-mover on encouraging user involvement in the innovation process. The program for user-driven innovation (Program for brugerrevet innovation) was established in 2006. Over three years, it provided DKK 300 million of funding toward strengthening new products services, concepts and processes in user-driven innovation, within the public and private spheres⁽⁶⁶⁾. In 2010 the program was cancelled and user-driven innovation efforts were taken over by the Business Innovation Fund (Fornyelsesfonden). A total of DKK 760 million is allocated until 2012 but user-driven efforts are primarily present in regards to welfare solutions. (See Chapter 4)⁽⁶⁷⁾.

The future for Danish innovation policy is outlined in the platform of the new Danish government. An increased focus is to be expected in three areas. First, the government wishes to enhance innovation by focusing on Denmark's strengths. Second, cooperation between the public and private sectors on innovation is to be expected. Finally, public procurement and tendering is likely to be embraced within future Danish innovation policy. The government has announced that public sector demand will actively encourage innovation and problem solving in order to make businesses more competitive and provide better service for citizens. Under the heading "intelligent demand," the platform states that within this electoral period a strategy will be presented⁽⁶⁸⁾.

Green growth and welfare

The 2010 "Strengthened Innovation in Enterprises" paper – the most up-to-date policy document from the Danish government on innovation – lays out eight focus areas. One is utilisation of the innovation potential within the green transition and welfare⁽⁶⁹⁾. The new government seems to further develop the emphasis on green growth and welfare in innovation policies. The platform states that Denmark should be better at competing on innovation and that future job creation will come in energy, environment and welfare⁽⁷⁰⁾.

The Danish Council for Technology and Innovation is the main funding agency for technological

(63) The Danish Council for Technology and Innovation (2010): *InnovationDanmark...*

(64) The Danish Council for Technology and Innovation (2008): *Strategi for styrket...*

(65) Monday Morning (2011): *Innovation får...*

(66) The Danish Enterprise and Construction Authority (2009): *Program for...*

(67) The Business Innovation Fund (2009): *Fakta om...*

(68) Government of Denmark (2011): *Et Danmark...*

(69) Government of Denmark (2010): *Styrket innovation...*

(70) Government of Denmark (2011): *får topprioritet hos ny regering*

innovation in Denmark. With an annual budget of DKK 1.1 billion, it provides funding for green growth and welfare in initiatives such as the Industrial Ph.D. Program, Innovation Networks (Innovationsnetværk) and the Approved Technological Service program. The latter has established nine independent Danish research and technology organisations – the GTS institutes. These provide technological competences and services for Danish businesses on commercial terms. Several of the institutes are enhancing innovation within green growth and welfare, like the Institute for Environment, Water and Health (Institut for Vand, Miljø og Sundhed).

Another important player on the Danish technology innovation scene is the Advanced Technology Foundation. The fund aims to provide value for society by investing in advanced technology projects that create value for society. It spends about DKK 0.5 billion annually, including efforts on welfare and green growth issues such as climate and environment, curing diseases and food quality.

Several programs and funds under different ministries support innovation in green growth. The Green Development and Demonstration Program focuses on food, agriculture and fisheries; the Energy Technology Development and Demonstration Program supports innovation in clean energy technology. Together, the programs provide funding of DKK 600 million. Also, an Environment Technology Development and Demonstration Program will be established in 2012, budgeted at DKK 77 million annually. The new Danish government has stated that environmental technology projects will be conducted as public-private partnerships within this program.

The Business Innovation Fund (Fornyelsesfonden) finances projects in three focus areas: innovation in green growth and welfare, market maturation in green growth and welfare and, finally, support for change-over to exploit new business and growth opportunities in less-favoured areas. Thus, this is a way to stimulate market development and innovations by businesses that provide solutions to societal problems (See Best practices).

The Danish PWT Foundation (ABT-fonden) is a DKK 3 billion (about 400 million Euros) cross-sector programme dedicated to developing and improving public sector services through the implementation of labour-saving technologies and more efficient working processes. It is therefore a crucial actor in spreading welfare innovation and organisational innovation in the public sector. The Danish PWT Foundation is set to last from 2009 to 2015; in the first two years, it invested DKK 478 million in 70 projects⁽⁷¹⁾.

(71) The Danish PWT Foundation (2010): *ABT-fonden*...

KEY PUBLIC ACTORS

- The Ministry of Science, Innovation and Higher Education: responsible for innovation and science policies. Also handles several business-oriented efforts such as Industrial Ph.D. Program, Innovation Networks (Innovationsnetværk) and the Approved Technological Service program and more. Will handle the development of the forthcoming national innovation strategy.
- The Ministry of Business and Growth: handles innovation policy issues mainly in relation to framework conditions that affect the growth of enterprises.
- The Danish Agency for Science, Technology and Innovation: performs tasks relating to the Danish research and innovation policy and supervises and provides services to a number of scientific research councils.
- The Danish Council for Technology and Innovation: advises the Minister of Science, Innovation and Higher Education on technology and innovation policy, and is the main funding agency for technological innovation in Denmark, with an annual budget of DKK 1.1 billion.
- The Danish Enterprise and Construction Authority (EBST): executes and develops governmental initiatives on regional development, growth conditions for companies and efficient construction. Also administers the Business Innovation Foundation. Due to the recent government restructuring in Denmark, the construction area was transferred to the Ministry of Climate, Energy and Building, whereas the enterprise area is part of the Ministry of Business and Growth.

Sweden

Innovation strategy: from science-driven towards challenge-driven

There are some past initiatives that could be regarded as innovation strategies. The most important is the 2004 publication *Innovative Sweden – A strategy for growth through renewal*. The strategy's vision is for "Sweden to be Europe's most competitive, dynamic and knowledge based economy, and thus one of the world's most attractive countries for investment by large and small knowledge-based enterprises. (...) Sweden will have the world's highest educational level, it will be best in the world at making use of the skills of its population and it will have a working environment that encourages women's and men's initiative and skills development. (...) Swedish society will combine economic development, social welfare and cohesion with a good environment"⁽⁷²⁾. The strategy seeks to create a knowledge base for innovation, make use of innovative public investments and promote innovative people.

In *Innovative Sweden*, the innovation drivers are an increasingly global and knowledge-based economy, a growing call for sustainability, an ageing population, and a growing importance of local and regional environments. In other words, investment is becoming increasingly mobile globally, international competition is getting tougher, the public sector is facing new demands, initiative and skills are growing in importance. All these challenges, will, according to the strategy, make it more important than ever to boost Sweden's capacity to renew itself⁽⁷³⁾.

In 2008, Bengt Åke Lundvall, characterized the Swedish innovation strategy as "conservative and narrowly focused" where "almost all public research takes place within universities and university colleges (högskolor) and innovation policy is mainly about how to transform and transfer research outcomes into innovation at the regional level"⁽⁷⁴⁾. A similar view is found in the *Inno-Policy TrendChart* by the European Commission, where the Swedish innovation strategy is described as rather traditional with a science-driven view on innovation focusing on investments in research through academic institutions and a framework for business on how to get the research results out⁽⁷⁵⁾. The latest national innovation bill on research *Ett lyft för forskning och innovation*⁽⁷⁶⁾ is, in outline, illustrative of this description.

Innovation trend: renewing the role of the public sector

A number of new initiatives suggest that the scope of innovation is likely to broaden in the near future. A national council for innovation and quality in the public sector was recently established. The council is to look at innovation in the public sector from a "holistic perspective" and examine rules, quality analyses and evaluations and describe the public sector's work with innovation, quality and business development⁽⁷⁷⁾.

A new coherent national innovation strategy, *En innovationsstrategi för Sverige*, is currently in public hearing and will be initiated in 2012. The strategy is to set up visions and targets towards 2020. It will also apply a "holistic" approach involving citizens, businesses, organizations and all ministries where "innovation means successful businesses, more jobs

(72) Government of Sweden (2004): *Innovative Sweden*

(73) Government of Sweden (2004): *Innovative Sweden*

(74) Lundvall (2008): *A note on...*

(75) European Commission (2009): *INNO-Policy TrendChart, Sweden*

(76) Government of Sweden (2008): *Ett lyft för forskning och innovation*

(77) Government of Sweden (2011): *Ett nationellt råd för innovation...*

and better life quality for all citizens”⁽⁷⁸⁾. A new bill for research and innovation is also expected in 2012. Innovation strategies are also being developed in various regions throughout Sweden, for example Skåne⁽⁷⁹⁾.

There is also a growing interest in the role of the public sector to stimulate innovation beyond a narrow focus on public R&D. In 2010, an inquiry on innovative public procurement commissioned by the government released a report with policy recommendations⁽⁸⁰⁾. The inquiry envisages a special potential for innovation procurement in three major areas: infrastructure, health and environment. In line with the report, the Swedish government has recently decided to support innovative public procurement in the budget. SEK 24 million this year and SEK 9 million in coming years are budgeted through VINNOVA to stimulate innovative procurement⁽⁸¹⁾.

Another programme linking the public sector with innovation in new ways is Service Innovation. The strategy from 2010 applies a “broad perspective” on innovation and emphasizes the importance of gaining knowledge about users’ and society’s needs in the innovation process. It also moves the innovation focus from individual products to functional solutions⁽⁸²⁾.

Green growth and welfare

The role of green growth and welfare in Swedish innovation policies is rather fragmented, but that is likely change in the coming National Innovation Strategy. There are several initiatives focusing on innovation in the two areas. One example is VINNOVA’s, Sweden’s innovation agency, recent strategy on “challenge-driven innovation,” which addresses essential or critical global needs and emphasises co-creation and users/customers whose demand for solutions incentivizes them to engage in developing and testing new solutions⁽⁸³⁾.

Another example is the Swedish Agency for Economic and Regional Growth (Tillväxtverket) strategy focusing on sustainable growth (hållbar tillväxt) with three dimensions: an economic, environmental and social.

With regards to green growth, research in climate is one of the six strategic research areas in the National Research Innovation Bill of 2008⁽⁸⁴⁾. The Service Innovation strategy claims that the switch to a sustainable society should be a major driver for services innovations⁽⁸⁵⁾. With regards to welfare, the Swedish governments recently initiated a “Strategy on Social Innovation in the Health Care and Care of the Most Ill Elderly and the Disbursement of Funds”⁽⁸⁶⁾. In this generously funded three-year strategy, the first step is for VINNOVA to provide data for the determination of appropriate indicators on performance goals, as well as for surveys, feasibility studies, evaluations and guidelines. It focuses on social innovation and social entrepreneurship and user-driven innovation such as Living Labs.

(78) <http://www.regeringen.se/sb/d/14440/a/161379>

(79) Forsknings- och Innovationsrådet Skåne et.al. (2011): *En Internationell Innovationsstrategi för Skåne*

(80) Statens Offentliga Utredningar: *Innovationsupphandling*

(81) Olofsson, Maud (2011): *Offentliga upphandlingar stöttar innovationer*

(82) Government of Sweden (2010): *En strategi för ökad tjänsteinnovation*

(83) VINNOVA (2011): *Challenge-driven Innovation...*

(84) Government of Sweden (2008): *Ett lyft för forskning och innovation*

(85) Government of Sweden (2010): *En strategi för ökad tjänsteinnovation*

(86) Government of Sweden (2011): *Uppdrag angående social innovation i vården...*

KEY PUBLIC ACTORS

- Ministry of Enterprise, Energy and Communications (Näringsdepartementet): Handles most innovation policy issues.
- VINNOVA: executes national innovation policy through financing of needs-driven research, development and demonstration, as well as strengthening networks.
- National Council for Innovation and Quality in Public Services (Nationellt råd för innovation och kvalitet i offentlig verksamhet): The council was established in 2011. Its aim is to support and stimulate innovation initiatives at the national, regional, and local level.
- Ministry for research and education: innovation policy issues concerning universities are handled here.
- Innovationsbron: focuses on turning research and innovation into business. Innovationsbron is owned by the Swedish state (84 pct.) and Industrifonden (16 pct.) and operates throughout Sweden.
- Swedish Agency for Economic and Regional Growth (Tillväxtverket): strengthens regional development and facilitates enterprise and entrepreneurship throughout Sweden.

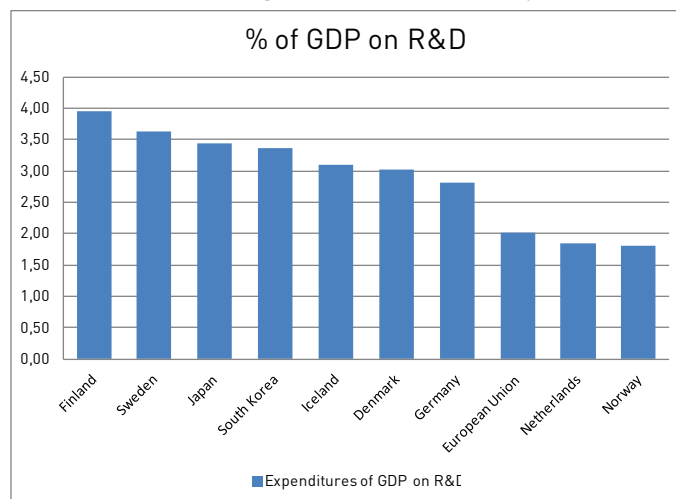
3. Mapping International Trends

Our mapping of innovation strategies in the EU, the OECD and four selected countries (Germany, Netherlands, Korea and Japan) indicates that green growth and welfare are going to be highly competitive in the coming years.

The countries were selected for various reasons – Germany, Japan, and Korea because of their economic significance and their status as “innovation leaders” and high levels of investments in research and development (R&D) (See Figure 1). The Netherlands was chosen due to its resemblance with the Nordic countries.

The strategies of the four selected countries stress the need for linking innovation policies with societal challenges, which is in line with EU and OECD adoption of a broad-based approach to innovation. The countries face diverse challenges, but they share a focus on two areas: green growth and welfare. In respect to green growth, the challenge is generally labelled as a need to innovate on technologies that reduce carbon emissions and increase energy efficiency. On welfare, the challenge is mainly related to health and ageing but again with a focus on technological and scientific innovation. In other words, global innovation leaders (nations, as well as many companies within the countries) put their stakes on technological innovation in green growth and welfare.

Investments in green growth and welfare are likely to rise in the future. Though expenditures on research and development are comparatively high in the Nordic countries, international competition on scientific and technological innovation will likely be fierce.



Source: Eurostat. Last available data: 2009, Japan and Korea: 2008

Japan's investments in research and development amounted to €140 billion in 2008 and Korea plans to spend 5 pct. percent of GDP in 2012, with 2 pct. earmarked to green growth alone. The global markets in science and technology in green growth and welfare are already a so-called "red ocean," where Nordic countries will have a hard time competing. The question: Where is the "blue ocean" for the Nordic countries?

Fortunately, innovation is not only about how much money is spent on research and development. And though our mapping does show that some of the international frontrunners on green growth and welfare are broadening their perspective on innovation beyond science and technology, it seems that the Nordic Countries possess capabilities within the "soft" areas of innovation. The "blue ocean" could be adopting an approach to innovation that encompasses all sectors of society, with innovative capabilities on all levels. It is here the Nordic countries have been first-movers and seem to have competitive advantages internationally. In the field of user-driven innovation and engagement of the public sector, especially, Nordic countries stand out from the mapping of international trends.

Conclusions from our mapping of international trends

- The EU and OECD presented new innovation strategies in 2010. Both point toward a broadening of the innovation scope beyond a narrow focus on R&D and a wish to connect innovation policies to major societal challenges – notably climate changes, health and ageing populations.
- The strategies of Germany, The Netherlands, Korea and Japan stress the need for linking innovation policies with societal challenges. The countries face diverse challenges, but they share a focus on two areas: green growth and welfare. Regarding green growth, the challenge is generally labelled as a need to innovate on technologies that reduce carbon emissions and increase energy efficiency. On welfare, the challenge is mainly related to health and ageing, but with a focus on technological and scientific innovation.
- Compared to international competitors, the Nordic countries are leaders in innovation that encompasses all sectors of society, with innovative capabilities on all levels. Especially in the field of user-driven innovation and engagement of the public sector, Nordic countries stand out in our mapping of international trends.

This mapping is conducted by first looking at the innovation policies of the EU and the OECD. Second, approaches to innovation, and innovation in green growth and welfare, are mapped in the selected countries.

Innovation in the EU and OECD

The EU as well as OECD presented new innovation strategies in 2010. Both strategies point toward a broadening of the innovation scope beyond a narrow focus on R&D and a wish to connect innovation policies to major societal challenges – most notable climate changes, health and ageing of societies.

The 2010 OECD innovation strategy clearly marks a new approach to innovation. The strategy encourages governments to extend the domain of innovation policies beyond ministries of science and technology and instead adopt a "whole-of-government" approach⁽⁸⁷⁾. Governments should have a "mobilising vision" and the ambition to realize it through policy coherence and

(87) OECD (2010): *The OECD Innovation Strategy – Getting a Head Start on Tomorrow*

effective vertical as well as horizontal co-ordination of policies. Innovation should also be fostered to achieve the “core objectives of public policy.” In other words, governments should “improve economic performance, address societal challenges and enhance welfare, through innovation.”

The open approach to innovation can be seen in strategy’s focus on “empowering people to innovate” – human capital. This involves innovation policies regarding education, skills, vocational training, lifelong learning, international mobility, workplaces, and a call for encouraging consumers to be active participants in the innovation process.

In 2010, the EU launched its “Europe 2020 Strategy” with seven Flagship Initiatives under the headline “Smart, Sustainable and Inclusive Growth”⁽⁸⁸⁾. According to the EU, “innovation is placed at the heart of the strategy” through the “Innovation Union” initiative⁽⁸⁹⁾. The most prominent target related to innovation in the strategy is the goal of spending 3 pct. of GDP on R&D by 2020.

Innovation Union also includes actions such as dedicated budgets for procurement of innovative products and services that improve the efficiency and quality of public services while addressing the major societal challenges – starting from at least €10 billion a year and creating a better legal framework for joint public procurements. Innovation Union also emphasizes action on a European Design Thinking Initiative, and a European Public Sector Innovation Scoreboard suggestive of a broadening of the innovation focus.

A number of actions related to green growth and welfare have been, or are about to be, taken under Innovation Union. Related to green growth, the Commission has launched the “Eco-innovation” initiative, which focuses on the specific bottlenecks, challenges and opportunities for achieving environmental objectives through funding of innovative projects⁽⁹⁰⁾. On welfare, the Commission has initiated a European Social Innovation pilot, which will provide expertise and a networked “virtual hub” for social entrepreneurs and the public and third sectors. The initiative will promote social innovation through the European Social Fund (ESF)⁽⁹¹⁾.

Germany

Germany ranks high on key statistics in innovation. Funding and investments in research are at an all-time high of 2.82 pct. of GDP in 2009, and on the “Innovation Union Scoreboard 2010,” Germany was ranked fourth, classified as an “Innovation Leader” in the EU.

Germany’s competitive advantages in innovation are high- and medium-high technology, combined with a tradition of innovation in services and efficient production⁽⁹²⁾.

The main strategy document is the German National Innovation Strategy, which was revised in 2010 by the Federal Ministry of Education and Research under the title “Ideas. Innovation. Prosperity. High-Tech Strategy 2020 for Germany”. The strategy is supplemented by funding opportunities and federal policies on innovation within research and development such as

(88) European Commission (2010): *Europe 2020 - A European strategy ...*

(89) Webpage of the Innovation Union: <http://ec.europa.eu/research/innovation-union/>

(90) Webpage of ECO-Innovation: <http://ec.europa.eu/environment/eco-innovation/>

(91) Webpage of Social Innovation Europe: <http://www.socialinnovationeurope.eu>

(92) European Commission (2009): *INNO-Policy TrendChart, Germany*

The Higher Education Pact, The Excellence Initiative and The Joint Initiative for Research and Innovation.

The main public actors in the German innovation system are the Federal Ministry of Education and Research and the Federal Ministry of Economics and Technology, but the national innovation strategy requires other ministries to develop innovation strategies and finance new measures. This allows for multiple approaches to innovation rather than more centralized systems, such as the case of Finland⁽⁹³⁾.

Approach to innovation

Innovation is defined in broad terms in the national innovation strategy as a means to secure “material, cultural and social wellbeing”⁽⁹⁴⁾. A mission-oriented approach is adopted, where forward-looking projects are pursued with the purpose of achieving scientific, technological and social development objectives. The strategy aims to engage multiple sectors of society in a dialogue on innovation, creating a scenario where “individual fields of technology are seen as contributions to realizing important social policy aims or as innovation drivers for other fields of technology”⁽⁹⁵⁾.

The competitive advantages of Germany call for an approach to innovation more focused on research and technology than that in the Nordic countries. The German strategy is moving towards a socially inclusive approach calling for the engagement of multiple societal actors. The next step is to describe concrete measures on how to enhance public dialogue⁽⁹⁶⁾.

Innovation in welfare and green growth

The national innovation strategy focuses on five “fields of action”: climate change, health and nutrition, mobility, security, and communication⁽⁹⁷⁾.

In regards to climate change, the strategy foresees a huge economic potential for innovation: “The prospects for growth are extremely positive: for example, the global market for environmentally friendly energy generation and storage will increase from €155 billion (2007) to €615 billion by 2020; the global market for energy efficiency will almost double by 2020 with an annual growth rate of 5 pct”⁽⁹⁸⁾.

And similarly in health and nutrition: “Forecasts for the coming years show there is growth potential in the various demand fields: in developed countries, demand for medical technology products will grow considerably faster than GDP at an average of 3 pct. to 4 pct. per annum by 2020; from 2006 to 2020, annual growth in the European telemedicine market is expected to reach 10 pct. or around €19 billion”⁽⁹⁹⁾.

This underscores that the Nordic countries are not alone in having welfare and green growth as key elements in innovation strategies. When Germany has two of five fields of action that

(93) Gjoksi, Nisida (2011): *Innovation and sustainable development*

(94) Federal Ministry of Education and Research (2010): *Ideas. Innovation. Prosperity...*

(95) Federal Ministry of Education and Research (2010): *Ideas. Innovation. Prosperity...*

(96) Gjoksi, Nisida (2011): *Innovation and sustainable development*

(97) Federal Ministry of Education and Research (2010): *Ideas. Innovation. Prosperity...*

(98) Federal Ministry of Education and Research (2010): *Federal Report on Research and Innovation 2010*

(99) Federal Ministry of Education and Research (2010): *Federal Report ...*

are highly related to welfare and green growth, Nordic countries will have to refine their strategy in order to set themselves apart.

Taking a look at the differences between the German and Nordic innovation strategies, it may be possible. Climate change innovation in Germany is more narrowly focused on technologies that curb emissions, even though it is stated that “the socio-economic and societal implications need to be given more consideration than in the past”; the Nordic countries seem one step ahead on innovation through a more holistic approach. On welfare, the Nordic countries have a more broad-based approach that focuses more on care, whereas the German approach focus on health and diseases.

The Netherlands

The Netherlands does relatively well on key innovation statistics. In the “Innovation Union Scoreboard 2010,” The Netherlands was ranked eighth, classified as an “Innovation Follower” in the EU. On investments in R&D, the Netherlands performed a not-so-impressive 1.85 pct. of GDP in 2009.

Innovation in The Netherlands is described in “Towards an agenda for sustainable growth in productivity”, regarded as the national innovation strategy⁽¹⁰⁰⁾. It describes a vision for The Netherlands in 2030 and is the long-term strategy of a government programme, “The Netherlands: Land of Entrepreneurship and Innovation”. The two central governmental actors are the Ministry of Economic Affairs, Agriculture and Innovation and the Ministry of Education, Culture and Science. The latter is responsible for scientific research and education and the functioning of the national research system as a whole, whereas the Ministry of Economic Affairs, Agriculture and Innovation mainly focuses on industry-oriented R&D and innovation policy⁽¹⁰¹⁾. The national innovation strategy is developed by the interdepartmental Knowledge and Innovation Program, which brings together all relevant governmental actors on innovation⁽¹⁰²⁾.

Approach to innovation

The national innovation strategy focuses on three themes: strengthening and using talent, enhancing and utilising public and private research, and promoting innovative entrepreneurship⁽¹⁰³⁾. According to the 2009 “Innovation Policy Progress Report,” these themes match the main weaknesses on innovation in The Netherlands: 1) insufficient investment in R&D and innovation 2) small- and medium-sized enterprises are insufficiently innovative and 3) a relatively low number of science and engineering graduates⁽¹⁰⁴⁾.

An approach to innovation was adopted that incorporates both economic and social goals through technological and social innovation. At the strategy level, Dutch policy is broad-based in its approach to innovation, recognizing societal factors in equal terms with scientific and technological. As in other European countries, the broad-based approach to innovation still lacks concrete measures and objectives to be implemented⁽¹⁰⁵⁾.

(100) Dutch Ministry of Economic Affairs, Agriculture and Innovation (2008): *Towards an agenda for sustainable...*

(101) European Commission (2009): *INNO-Policy TrendChart, Netherlands*

(102) Gjoksi, Nisida (2011): *Innovation and sustainable development*

(103) Dutch Ministry of Economic Affairs, Agriculture and Innovation (2008): *Towards an agenda for sustainable...*

(104) European Commission (2009): *INNO-Policy TrendChart, Netherlands*

(105) Gjoksi, Nisida (2011): *Innovation and sustainable development*

Innovation in welfare and green growth

Innovation in The Netherlands is framed within a sustainability discourse, seen in the fact that sustainability is even part of the title of the national innovation strategy⁽¹⁰⁶⁾. This sends a clear signal that innovation is the key to emerge strengthened from the challenges The Netherlands faces: “climate change, the ageing population, the exhaustion of natural resources, loss of biodiversity and environmental pollution”⁽¹⁰⁷⁾. Those challenges are to a large extent similar to the ones identified in the Nordic countries, which explains a similar focus in innovation policies. All of the ambitions for the Dutch society in 2030 encompass sustainability, and they call for innovation in welfare, green growth or both. The ambitions are: a sustainable and climate-resistant water system, a sustainable mobility system, sustainable agriculture and fishing industry, a sustainable living environment, sustainable energy provision, sustainable health, and a sustainable security system⁽¹⁰⁸⁾.

Korea

Korea ranks high on investments in research and development. In 2008, 3.36 pct. of GDP was spent on R&D. Only Sweden and Finland spent more of GDP on research and development that year.

It seems Korea will move past all Nordic countries within a relatively short timeframe. According to the 2008-2012 governmental strategy on science and technology, the “577 Initiative,” Korea plans to spend 5 pct. of GDP on research and development in 2012, concentrating on seven major technology areas. The goal is to place Korea among the seven major science and technology powers in the world⁽¹⁰⁹⁾.

Approach to Innovation

The task of Korean innovation policy is to contribute to a shift from a catch-up economy to a creative economy. This process was initiated in the aftermath of the 1997-98 Asian financial crises and was articulated for the first time in the 2004 implementation plan for the national innovation system⁽¹¹⁰⁾.

The catch-up model of the Korean economy focused on large-scale development of certain technologies in cooperation with large conglomerates. But, to move towards a creative economy, Korea is pursuing more innovation from small- and medium-sized enterprises, increasing knowledge transfer in the system, and dedicating funding in the increased budgets for research and development to basic research⁽¹¹¹⁾.

Innovation from small- and medium-sized enterprises is pursued in the 577 Initiative through increased funding to the Korea Small Business Innovation Research Program, deregulation of start-up processes and measures to increase private financing. Also, a focus on clusters enhances knowledge transfer and cultivates regional innovation capacity that benefits non-metropolitans parts of the country⁽¹¹²⁾.

(106) Gjoksi, Nisida (2011): *Innovation and sustainable development*

(107) Dutch Ministry of Economic Affairs, Agriculture and Innovation (2008): *Towards an agenda for sustainable...*

(108) Dutch Ministry of Economic Affairs, Agriculture and Innovation (2008): *Towards an agenda for sustainable...*

(109) Ministry of Education, Science, and Technology (2010): *Science and Technology Basic Plan...*

(110) OECD (2009): *OECD Reviews of Innovation Policy – Korea*

(111) OECD (2009): *OECD Reviews of Innovation Policy – Korea*

(112) Ministry of Education, Science, and Technology (2010): *Science and Technology Basic Plan...*

Despite the shift towards a creative economy, the innovation strategy of Korea remains science and technology driven. There's still a long way to go on "soft" innovation that incorporates non-technological elements and enhances innovation capabilities throughout the economy. Moreover, dialogue with society and a user-focus is to a large extent not utilized in the Korean approach to innovation.

Innovation in Welfare and Green Growth

Korea's biggest company, Samsung, is known for reinventing its core capabilities, having moved from making batteries to flat screen televisions to the flash memory in your iPhone. And now they are moving away from "infotainment" and into "lifecare." According to Samsung, big business in the 21st century is in green technology and health care⁽¹¹³⁾. With an impressive 13 pct. of Korea's gross exports, Samsung is highly influential on the Korean economy.

When the financial crisis hit markets around the world, in 2008, Korea acted promptly, announcing the so-called "Green New Deal," in January 2009. The stimulus package, which comprised financial, fiscal and taxation policies, totalled US\$ 38.1 billion from 2009-2012. This policy is now folded into the five-year plan that is part of the national strategy on green growth. These policies show a strong Korean commitment to promoting green growth through spending 2 pct. of GDP per year through 2013⁽¹¹⁴⁾. Environmental policies are seen as a catalyst for eco-innovation, in particular by creating new markets for low-carbon technologies and equipment.

Korea will likely continue to play a leading role on technology innovation, particularly green growth and to some extent welfare. But the approach still lacks emphasis on "soft" innovation, which highlights the Nordic countries unique position of competence in this area.

Japan

Japan continues to have a strong innovation climate, with the highest spending on R&D among the G7 countries – increasing from 3.2 pct. in 2003 to 3.7 pct. in 2008 (equivalent to EUR 140 billion)⁽¹¹⁵⁾. The New Growth Strategy aims to increase investments by the government and private sectors to a total of 4 pct. or more of GDP in 2020⁽¹¹⁶⁾. With the US, Japan is considered a global innovation leader, ranked ahead of the European Union in the "Innovation Union Scoreboard 2010"⁽¹¹⁷⁾. However, in R&D spending, Japan is still behind some of the Nordic countries (Finland and Sweden).

Approach to innovation

Japan's innovation approach focuses on science and technology (S&T), mainly through business R&D expenditures. The Business Expenditure on R&D accounts for 77 pct. of total expenditure; the government sector accounts for only 16 pct⁽¹¹⁸⁾. Japan's innovation policies are laid down in the Basic Plans, written by the Council for Science and Technology Policy (14 members, including the prime minister, six cabinet ministers and other experts) under consultation with the government. The 3rd Basic Plan (2006 - 2010) fostered a shift from

(113) The Economist (2011): *Samsung: The next big bet*

(114) Jones, Randall S. and Byungseo Yoo (2010): *Korea's green growth strategy...*

(115) European Commission (2009): *INNO-Policy TrendChart, Japan*

(116) Council for Science and Technology Policy (2010): *Japan's Science and Technology Basic Policy Report*

(117) European Commission (2011): *Innovation Union Scoreboard 2010*

(118) European Commission (2009): *INNO-Policy TrendChart, Japan*

“hard” to “soft” innovation, focusing on investments in human resources and improvement in the mobility of personnel⁽¹¹⁹⁾.

The 4th Basic Plan, from 2011, breaks with the traditional Japanese strategy of innovation as a closed internal process within businesses because: “accelerated realization of innovation is becoming more important, innovation systems are greatly shifting to more open, global, and flat platforms, and the commercialization of research and development of S&T is also progressing. (...) Industrial systems are changing sharply and open innovation has become a mainstream, e.g., a key to innovation is networking ‘knowledge’ even in the phase of basic research through collaboration between researcher communities and outsiders. *Hence, construction of a new and open STI system is urgently required.*” Innovation is nevertheless predominantly about technology and less on other innovation forms⁽¹²⁰⁾.

The Basic Plan outlines five visions for Japan’s innovation policy:

- Achieving sustainable growth – focusing on problems of restricted use of resources/ energy and aging
- Realizing an affluent high-quality life for the people
- Becoming a country that possesses S&T as the foundation for national survival
- Becoming a country that takes the initiative in solving global issues such as climate change
- Becoming a country with a culture that continues to create various, unique and advanced “knowledge” assets, and fosters S&T

Innovation in welfare and green growth

On welfare and green growth, the Basic Plan is remarkably clear. As the way to realize sustainable growth, the plan positions “Green Innovation” (environment and energy) and “Life Innovation” (medical care, nursing care, health) as the major pillars of growth.

The strategy of Green Innovation involves realizing the “world’s most advanced low-carbon society by identifying trends in de-fossil fuel that many countries are developing competitively as a key to future growth.” It also envisions a “sustainable recycling society that exists in harmony with nature, and bring affluent people’s lives.”

The measures include regulatory and institutional reforms and promotion of R&D in clean energy (solar power, biomass utilization, wind power, small scale hydropower, geothermal power, tidal power, and wave power), energy use (hydrogen supply systems, including storage batteries, fuel cells, recharging infrastructure; superconducting power transmission; sustainable chemistry and bio-refineries; higher-grade insulation systems for houses and buildings; stationary fuel cells; more efficient lighting; power semiconductors; power control via storage batteries and fuel cells; and power electronics used for next-generation automobiles), and in social infrastructure (mega network systems, water resource management systems, and recycling technologies).

(119) Government of Japan (2006): *Science and Technology – The 3rd Basic Plan*

(120) Council for Science and Technology Policy (2010): *Japan’s Science...*

The Life Innovation strategy includes preventive care early diagnostic methods, safe and effective treatment, and improvement of quality of life of elderly and disabled persons and patients. The strategy envisions to “realize a society where people are healthy in body and mind and can feel happily.” The measures focus on regulatory and institutional reforms related to examinations for approval and development R&D environments.

4. Selected Best Practices – Pathways Toward New Nordic Innovation

This section presents examples of best practices throughout the Nordic region. The cases illustrate pathways towards new Nordic innovation in five areas:

1. Public Tendering and Procurement
2. Exporting Nordic Welfare and Green Growth
3. User-centred Innovation
4. Cluster Thinking in Green Growth and Welfare
5. Three-dimensional Sustainability – Initiatives Synthesizing Environmental, Economic and Social Challenges

1. Public Tendering and Procurement

Public tendering and procurement is increasingly seen as an effective way for the public sectors to stimulate innovation and pursue societal goals. Increased engagement by the EU and the Nordic countries to remove barriers hindering innovation will make this issue even more promising in the near future.

According to a recent study by FORA (the Danish Enterprise and Construction Authority's division for research and analysis) for Nordic Innovation, the main barriers for public tendering and procurement in the Nordic countries are the lack of flexibility in law and regulations, user resistance to change, and lack of incentives in projects that includes many partners⁽¹²¹⁾. Our interviews with innovation experts and stakeholders confirm that strict interpretation of rules by the Nordic governments and courts impedes the public sector exploiting its huge potential.

At least two developments promise a future where public tendering and procurement play a significant role in stimulating innovation:

First, the EU plans to revise the rules for public tendering to make them more flexible and suitable for innovative procurements. The European Commission recently released a "Green Paper on the modernisation of EU public procurement policy," which focuses on the "huge and untapped potential to drive innovation through public procurement"⁽¹²²⁾. A revision of the Public Procurement Directives to make them simpler and more flexible is also high on the

(121) FORA (2011): How Public Procurement can stimulate Innovative Services

(122) European Commission (2011): Green Paper on the modernisation of EU public procurement policy...

agenda for the coming Danish EU Presidency⁽¹²³⁾.

Second, a number of cases from Nordic countries show that even while we wait for better legislation, there are great opportunities for the public sector to foster innovative solutions in the areas of green growth and welfare by organizing the tendering process in new ways. A few selected cases illustrate this development.

Conferences of dialogue

Early dialogue between public sector and suppliers led to smarter elder care facilities

The City of Oslo has found a new way to tackle challenges from an ageing population. The aim of Omsorg+ (Care+) is to make the elderly less dependent on help from others and more self-supporting through better-assisted living facilities. The municipality wanted housing with facilities that could foster safety, social interaction, and activity and thereby slow down the limitation of abilities in the elderly. It is a massive procurement, involving 1,000 new houses before 2015. The houses will be innovative, integrating smart house technology and welfare technology into the facilities. There were no ready-made standard solutions on the market, so a traditional tendering process specifying in fine detail the demanded product would not be suitable. “What we demanded was a coherent system, not a bunch of individual gadgets” says Eva Hurtig, Project Manager in Oslo’s Department for Seniors and Social Services.

The municipality consulted The National Program for Supplier Development together with Oslo Medtech – a cluster of 95 companies focusing on medical technology – in order to facilitate the tendering process. Before the final tender was decided on, a number of “conferences of dialogue” (dialogkonferanser) were held where interested suppliers were invited.

The public procurers gained valuable information on the available solutions on the market; the suppliers were given the opportunity to better understand the needs and intentions of the customer and develop solutions based on a description of needs rather than a detailed specification requirement. Furthermore, the conferences provided a forum for the companies to find potential collaborators needed for bidding on the project.

Learning about innovative procurement

Awareness is a precondition for innovative procurement

More knowledge on innovative procurement is a precondition for success. That goes for those engaged in public sector procurement as well as those supplying the services and products.

In Sweden, public procurers have recognized that barriers exist on both sides of the process. On the one side, small- and medium-sized businesses often have a distorted perception of the public tendering process that restrains them from bidding. On the other side, public servants often design the tender in a way that makes it impossible for small- and medium-sized business to bid.

This was the backstory for a *Lärande om innovativ upphandling* (Learning about innovative procurement) initiated by the Swedish Agency for Economic and Regional Growth

(123) Dithmer, Michael (2011): Speech at the Conference on the Modernisation of EU Public Procurement Policy

(Tillväxtverket). The project funds education of representatives from small- and medium-sized companies and officials from municipalities in sparsely populated areas. The aim is to overcome the typical “us and them” way of thinking between purchasers and suppliers. Through dialogue, businesses acquire a better understanding of the rules of tendering; officials, meanwhile, learned how to simplify the process of tendering. Not only does a simpler process encourage more offers, it also builds trust and mutual understanding between the parties and creates space for creativity.

From the beginning, it was expected that project successes should be disseminated to other Swedish regions. Today, the regions of Västra Götaland, Västerbotten, Skåne, Dalarna participate in the project.

Finnish Environment Institute

Stringent requirements stimulate creative solutions

When purchasers aim high, they inspire suppliers to perform and be creative. But focus needs to be on the functional requirements of the product, thereby freeing the suppliers to find innovative solutions. In 2009, the Finnish Environment Institute (SYKE) decided to build a new office and laboratory building with room for 600 employees, to be located in Helsinki. SYKE did not want any new office building; they wanted to lead by example and build the most sustainable office building in the world.



With funding from Tekes, and in cooperation with Senate Properties, which provides workspace services for state organizations, a building design competition was organized. Public tender calls invited design teams to submit professional qualifications of teams with a mix of competencies – architecture and engineering as well as energy efficiency and ecological sustainability.

The following criteria were given as the ecological goals, to be used in comparing competing entries: achieving “almost zero-energy buildings,” local production of renewable energy, and minimizing the carbon footprint of the building. A tool for calculating the carbon footprint of the construction materials was also developed for the project. The winning entry, a wood-based structure, had the smallest carbon footprint, calculated on the basis of its construction materials and energy use.

The competition proved that demanding requirements do not stifle creativity. The environmental targets inspired fresh innovations that enabled a new kind of dynamic architecture.

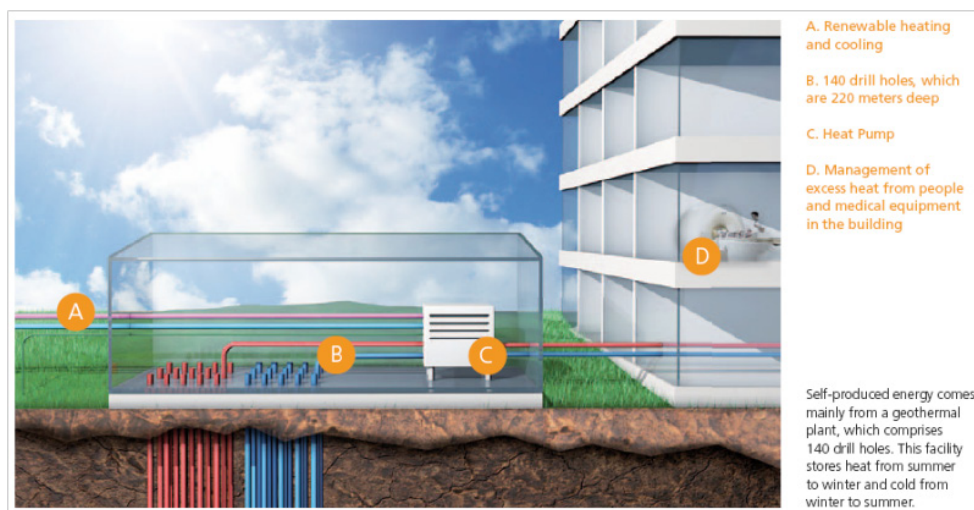
Karolinska Hospital

Green health care with private-public partnerships (PPPs)

Through a large-scale private-public partnership, the New Karolinska Solna University Hospital combines health services that focus on the patient's perspective with being the world's most environmentally friendly hospital. The hospital is to be built in cooperation between the Stockholm County Council and the private project company Swedish Hospital Partners (SHP).

High environmental standards, dictated by the Stockholm County Council, have induced SHP to come up with innovative green solutions. The hospital will have its own geothermal plant and only use renewable electricity. It should achieve the highest ranking on several environmental buildings standards. Builders have planned for sustainability in the construction process and the indoor environment for workers.

The hospital is to be finished in 2017. SHP is responsible for developing, operating, maintaining and financing the facility until 2039. By 2025, the Stockholm Region plans to be a world-class life science cluster with Karolinska Hospital as the main driver. Research at the hospital is conducted in close proximity to the patient thereby "creating patient-oriented research facilities within health care environments."



Source: Picture from 'We are Building a World Class University Hospital'

Other Nordic countries are also working towards increasing the use of private-public partnerships. The high level of trust in public institutions present in Nordic societies has engendered hope for this approach to innovation. Private-public partnerships have been used when constructing public buildings in key welfare areas such as education and health care. In these cases, a private contractor is typically responsible for building construction and maintenance, and the state rents the building. Private-public partnerships have also been used to build public infrastructure such as roads, in which case the private contractor is the builder and provides financing. PPPs are seen as drivers of innovation insofar as private contractors only have to meet certain public criteria but are otherwise free to innovate to provide new solutions to meet demand.

So far descriptions and evaluations of private-public partnerships are rare. But if they are used correctly, long-term and life-cycle perspectives can be implemented in, for example, the building process, thereby enhancing sustainability. Therefore, private-public partnerships could be a tool for coupling innovation within green growth and welfare.

2. Exporting Nordic Welfare and Green Growth

There has long been a large and growing interest in the Nordic welfare model, and, since the 1990s, there has been debate in the Nordic region on the potential for system export. Worldwide interest exists in how the Nordic Model can be turned into a business adventure for companies that can provide hands-on solutions that are somehow *inspired* by the Nordic way of living. There is no straightforward answer on how to transfer Nordic innovations in green growth and welfare to other markets, but a number of cases point the way forward.

The process is, however, complicated. Areas traditionally controlled by the public sector are difficult for foreign companies to enter, and green growth and especially welfare are often marked by strong national or regional traditions that represent completely different models of society. Cases show that it takes extensive involvement from government agencies to make it happen.

The Finnish Wellbeing Center

Turning “Nordic-style” elder care into a market concept

Japan’s population is aging more rapidly than any other country in the world. It is expected that Japan faces a structural change that will, in all probability, take place at an unprecedented pace. Finland, on the other hand, has already experienced a similar phenomenon and established a first-rate welfare system, with know-how accumulated since the 1950s. Japanese authorities and experts have taken a close look at the Nordic, and especially the Finnish, way to take care of ageing senior citizens. In 2000, this interest led to the idea of offering an entire Finnish concept for the care of older people for use in Japan.



Picture from <http://sendai.fwbc.jp>



The principles of “Finnish-style welfare” include: emphasis on privacy; delaying the deterioration of functioning; and sustaining the ability to participate in society. Finnish-style welfare thus seeks to realize independent lifestyles for the elderly.

The concept of The Finnish Wellbeing Center was developed by Finpro as project management body, with support from Tekes’ iWELL technology programme. The city of Sendai, the capital of Japan’s Tohoku region, was selected as the location for a trial facility. The facility is designed to serve as an R&D centre for high value-added health and welfare equipment. The R&D functions are combined with a special nursing home for the elderly, as well as office functions for marketing and business-to-business relations.

The Center was completed in 2005, and was far the largest project to be implemented abroad utilizing Finnish well-being technology, with over 20 Finnish companies involved and construction valued at €33 million. Two additional Finnish Wellbeing Center Japan have been completed in the cities of Agano and Saijo. These are to be followed by “full scale market entry” by partnering with Japanese major healthcare players for rollout across Japan.

In 2010, with inspiration from the Finnish-Japanese cooperation, a Thai-Finnish Wellness Center was established in Bangkok focusing on health-oriented fitness training for all age groups.

Navigator Prosjektet

Facilitating access to health and welfare in China

China, too, is showing interest in the Nordic welfare model. Numerous Chinese delegations have visited the Nordic countries to study the model. At the same time, China has since 2009 begun a large-scale renewal of its healthcare services.

Under the “Navigator Projektet,” Innovation Norway has together with three medical and healthcare clusters initiated a programme that seeks to take advantage of these two coinciding trends, and help Norwegian healthcare companies set up operations in China. It is generally difficult to enter the Chinese market without inside knowledge. For Norwegian small- and medium-sized companies with limited resources, it is extremely difficult to deal with the entry barriers on their own, such as choosing the right Chinese partner to help get products approved by the authorities.

Cargotec

Waste Collection System in Yunnan Province of China

There is a long tradition of sustainable waste collection and distribution in the Nordic countries. Stringent regulations and public support have pushed companies to come up with environmentally-friendly and cost-effective solutions. China’s environmental markets, meanwhile, are booming. It is estimated that the output of China’s environmental protection industry will grow at an average annual rate of 15 pct. and will reach 900 billion yuan (around EUR 100 billion) by 2015.



Picture from: <http://news.yntv.cn>

In Finland, some of the most advanced waste collection companies have joined forces under The Finnish Environmental Cluster for China (FECC), facilitating access to the promising Chinese environmental markets. FECC's operating model is to build concept solutions from companies' products and services that offer Chinese customers a broad-based solution to their problems across the value chain.

Operating from its own leadership position, Finnish company Cargotec, in cooperation with the most advanced Finnish suppliers in the solid waste handling industry, developed a concept for solid waste handling including collection system and compressing collection vehicle, embedded garbage compression station, garbage bin cleaning and disinfection vehicle.

In 2009, FECC organized for Cargotec to visit the city of Kunming several times, and shared the advanced Finnish technology with leaders of Kunming Municipal Government and Kunming Urban Management Bureau. In December 2009, the parties reached an agreement to improve Kunming sanitation infrastructure and increase garbage handling capacity. They also selected the first demonstration site. Under FECC facilitation, the project received support and attention from high-level Chinese and Finnish officials. The system went into operation in Kunming in October 2010.

3. Innovation Together With Users

Our mapping showed that all Nordic countries recognize an enhanced role for users in the innovation process. Also apparent from the mapping is that international institutions such as the OECD and the EU highlight user-involvement in innovation strategies. This shift is seen as a means to solve key societal problems and enhance competitiveness of the public and the private sector.

But how is user- and demand-driven innovation pursued in the Nordic countries? Some cases stand out.

Ideas Clinic

Innovation birth helpers at Oslo University Hospital

At the Oslo University Hospital, a special clinic helps give birth to innovative ideas. Employees, patients and relatives bring their ideas to the Innovation Clinic, where they are nurtured until the idea can be patented and sold, or developed into concepts that raise service levels at the hospital. A team of specialised employees with a wide range of backgrounds facilitate an innovation process that is 100 pct. user-driven and focused on the demands of patients, employees or other users.

The concept, called “Ideas Clinic,” was established in 2007 at Oslo University Hospital but has since spread to other Nordic countries. It is part of a unique EU-funded collaboration on user-driven innovation between hospitals in Denmark, Sweden and Norway called the KASK Innovation project.

Aalborg Hospital established a similar ideas clinic with a team specialised in idea and project development, engineering, industrial design, business law and commercialisation. Sweden’s Sahlgrenska University Hospital is also involved in the project; they have chosen a regional initiative called “Innovationsslussen” for enhancing innovation. The collaboration between the three Nordic hospitals has produced a database of ideas that stem from more than 40,000 employees and an even greater amount of patients and relatives.

Results are starting to show. At Södersjukhuset, in the Stockholm area, a project similar to the ideas clinic has resulted in a new simple method to take blood samples from the navel string seconds after birth. The ideas clinic at Aalborg Hospital has applied for 16 new patents since launching in 2009. Furthermore, the clinic received an innovation award for the work on an oxygen providing teat. The clinic has proven such a success that the problem of scaling has been overcome, with more Ideas Clinics set to open at hospitals in the Northern Jutland region.

Living Labs

Safety and monitoring of patients in Halmstad

At the Halmstad Living Lab, a network of elderly patients, relatives, companies and researchers work to develop a set of devices enabling the elderly to monitor visitors on a small portable display, before they open the door. At the same time, the device records how often the door is opened and closed, establishing a better monitoring of patient behaviour. The product, Lock Assist from Phoniro, is now on sale.

Living Labs is a concept aimed at enhancing innovation through a user-centric approach. Small public or private centres bring together key stakeholders in the innovation process. These stakeholders can be public sector institutions, companies, public and private research institutions and the end-user communities. Living Labs play a key role in facilitating innovation in the public sector, the private sector and in collaborations between the two.

Living Labs have been established throughout the Nordic region. The Helsinki Living Lab sees the role of Living Labs as “a system for building the future innovation environment in

which real-life user-driven research and innovation will be a normal co-creation technique for new products, services and social infrastructure. This human-based involvement enables the development of useful new services and products.”



According to the European Network of Living Labs, 35 such labs exist in the Nordic countries. Finland and Sweden are frontrunners with 16 and 12 labs respectively. Several Living Labs have specialised in welfare-related issues, such as the SOTTEC Living Lab, in Sweden, focusing on elder care. An approach to innovation that involves multiple societal actors is adopted because “research and development in technology for the elderly requires distant research fields to share insights on common problems. These include medicine, social work and technology. Moreover, results need to be backed by psychological validation, the approval of society and the interest of the healthcare infrastructure and stakeholders.”

4. Cluster Thinking in Green Growth and Welfare

Clusters are not a new concept within business and innovation policies, but they are still gaining momentum in the Nordic countries. This is not surprising since clusters are all about cooperation. Innovation – though oftentimes focused on technology – is inherently based on inputs from multiple actors across the public and private sectors. Cluster thinking is extensively utilized within both green growth and welfare issues.

Welfare Tech Region

Rethinking regional strengths

The Region of Southern Denmark is like many other regions in the Nordic countries affected by closing or outsourcing of industrial enterprises. One of the biggest employers – the Odense Steel Shipyard, builder of some of the world’s largest container ships – has decided to close its businesses in 2012.

The Welfare Tech Region initiative is an attempt to pre-emptively confront this sad but inevitable development and exploit the knowhow gathered in the region to stimulate a market in welfare technology. Over the years, the shipyard had applied advanced robot technology to shipbuilding. This knowledge capital could be of great value in the area of welfare technology. Welfare Tech Region is a cluster cooperation between companies, research institutions, hospitals and municipalities. More than 200 companies in some way work with welfare

technology in the region. The cluster invites enterprises to take part in innovation by opening up the social and health sector to pilot projects and testing of new products, methods and solutions. It involves users in the innovation process by establishing a platform where they can present ideas for other stakeholders such as businesses and public institutions.

The aim is to create 500 jobs, 50 new enterprises, and 100 new development projects on welfare technology over three years.

The Finnish Cleantech Cluster

Third best in the world

Cooperation in clusters also flourishes in green growth. The Finnish Cleantech Cluster was recently ranked third best in the world by the International Clean Tech Group. The high international ranking is due to the cluster's ability to create new green jobs and companies, and involve a large part of the Finnish clean tech sector. About 60% of Finland's environmental business is covered by the cluster, and 80% of the sector's research happens within the cooperative frame of the cluster. The cluster seeks to help create 40+ high-growth clean tech companies per year. International cooperation involves partners in developing markets such as Russia, China and India. Cluster success stories include Eagle Windpower, EcoCat, Numcore and Green Stream Network.

Overall, the Finnish Cleantech Cluster is made up of Kuopio, Lahti, Oulu, and Helsinki and surrounding areas. Each of the four centres of expertise specializes in different aspects of clean tech. In Kuopio, cluster thinking works as a means to combine innovation within green growth and welfare issues. The Kuopio Region Centre of Expertise promotes new innovations within health, environment and well-being. For instance, new kinds of user-friendly environmental measuring and monitoring are introduced and serve as a way of increasing welfare of patients while adapting to climatic changes.

Successful green clusters are not seen in Finland alone. In the ranking from International Clean Tech Group, the Danish Copenhagen Cleantech Cluster and the Stockholm Environmental Technology Centre, in Sweden, ranked in the top ten.

5. Three-dimensional Sustainability – Initiatives Synthesizing Environmental, Economic and Social Challenges

At first glance, it is hard to find the common denominator in the cases that follow dealing with issues as diverse as cycling, food, telemedicine and wellness. They all, however, somehow manage to provide or facilitate innovative solutions that deal with environmental, social and economic challenges at the same time. The cases could serve as inspiration and eye-openers for thinking about innovation policy and sustainability in three dimensions.

IBikeCph

Biking combines green growth and well-being

For Copenhageners, bike is the transportation mode of choice. Reduced costs for society, improved health and quality of life, increased tourism and job creation are some of the side effects. Innovative efforts in urban traffic planning create both green growth and welfare in Copenhagen.

In 2002, Copenhagen initiated its first cycling policy strategy, with the aim of increasing the number of residents cycling to their workplace and making it safer to bike in the city. In the coming strategy, Copenhagen aims to become the world's best cycling city in 2025.



More than half of Copenhagen's citizens go to work or studies by bike. Urban planners have gone beyond designing a city where cycling is possible, they have created a city where cycling is the norm. And that's good business for Denmark. An analysis by the consulting firm COWI from 2009 stated that cycling adds DKK 1.22 per driven kilometre to the overall societal economy whereas a car costs society DKK 0.69 per kilometre. Bikes reduce costs for society on a number of parameters, including air pollution, climate change, noise, accidents, infrastructure wear and congestion.

Another positive effect of cycling is improved health for citizens. The health benefits are estimated at DKK 2 billion in Copenhagen alone, which compromises fewer sick days and fewer medical expenses and treatments. Copenhageners also experience increased quality of life, with 58 pct. feeling "enjoyment" when going by bike, according to a 2000 survey. The same survey found only 12 pct. of bikers experienced stress during their commute; for motorists and bus passengers, almost one in five felt stressed.

Biking directly affects the labour market of Copenhagen, with an estimated 650 full-time jobs in a sector that has an annual turnover of more than DKK 1.3 billion. Furthermore, biking benefits tourism. For instance, *Time Magazine* in 2010 rated Copenhagen the world's fifth most attractive tourist destination, partly due to the excellent biking conditions. Another interesting initiative stemming from the focus on cycling is the Cycling Embassy of Denmark – a large cluster network of private companies, local authorities from around Denmark, and NGOs working together to promote cycling all over the world. It cooperates with the Danish Foreign Ministry to promote Denmark and cycling abroad.

Telemedicine

A promising way towards sustainable healthcare

Telemedicine can create better and more cost-efficient medical treatment while cutting CO₂ emissions.

This summer four young British men were attacked and severely injured by a Polar bear on the island of Svalbard. The island is populated by no more than 2,500 inhabitants, and is located almost 1,000 km from the nearest hospital in Norway, Tromsø. The men were quickly brought to the small local medical station. In two minutes, a so-called "medical emergency communications central" (Akuttmedisinsk kommunikasjonssentral) was set up allowing specialist surgeons from the university hospital in Tromsø to see and communicate with the local medical staff and the patients. The guidance of the surgeons helped save the men's lives.

The medical emergency communications central is one of the innovative outcomes of a long-term cooperation between Norwegian hospitals and the Norwegian Centre for Integrated Care and Telemedicine (NST).



Picture from NST, www.telemed.no

In Norway, telemedicine – the use of ICT to provide clinical health at a distance – has become a natural way of coping with the challenge of long distances and small distant communities. Likewise, the hospital in Thorshavn, Faroe Islands, has since 1993 successfully cooperated with dermatological doctors at the hospital in Roskilde, Denmark. Over the last 8 years, more than 6 pct. Of the Faroe Islands population has been examined or treated by means of telemedicine.

The opportunities to use telemedicine go beyond coping with far distances. In Aalborg, Denmark, the project “Telekat” has looked at the way telemedicine can be used to ease the treatment and monitoring of patients with chronic diseases. Patients themselves measure blood pressure, pulse, weight and oxygen saturation. The data is automatically transferred to a platform accessible by nurses and doctors. Preliminary results show that the Telekat has led to significantly fewer hospital visits.

The benefits and opportunities in telemedicine are manifold. First, if used ethically, telemedicine can lead to an increase in health and well-being of citizens. Second, it can reduce costs by lowering the need to transport patients and preventing hospital admissions. For instance, an analysis of a Scottish investment of £16.4 million in telemedicine in elder care proved savings of nearly £50 million. Hence, telemedicine can be a way to confront the demographic challenges of ageing as well as ensure care for marginalized populations in distant areas.

Third, telemedicine has significant green as well as growth potentials. As telemedicine usually reduces the need to transport patients, it also reduces CO₂ emissions. An Ericsson Research study on home-based care of elderly patients with chronic leg and foot ulcers in Sweden shows

that if telemedicine were introduced nationwide for the entire patient group, it would reduce total CO₂ emissions by 2,100 metric tons per year – equivalent to 84,000 hours of driving. Growth potential is seen in that telemedicine is a fast-growing global market with competitive advantages for Nordic companies. The combination of green growth and welfare innovation in telemedicine is precisely the aim of the newly established research network KITENPI between Swedish, Norwegian, Finnish and Russian research institutions.

New Nordic Food

From avant-garde gourmet to school canteens and private kitchens

In 2011, the global status of Nordic cuisine reached unprecedented heights. The Danish restaurant Noma was named the world's best restaurant for the second year running, and in the Bocuse d'Or – the unofficial biennial world chef championship – the three top places were for the first time held by three Nordic chefs.

This could look like a coincidence, but the success in the “world of gourmet” is the result of a long-term and wide-ranging development involving not only world-class chefs but farmers, retailers and consumers. It is easily forgotten that the most important precondition for the present success of Nordic gourmet is the existence of high-quality food products sourced from organic farms.

The first seeds were planted in 1987, when Denmark became the first country to implement an organic farming law. Retailers played a significant role in promoting organic products, as did quality-conscious home markets in the years after. Today, Nordic food has not only become a global brand attracting tourists to the region, it also creates jobs in the food industry. There are now more than 1,000 small food businesses specializing in refinement of Nordic ingredients throughout the region.

A number of new products have been developed or rediscovered such as microbrews, “spelt” flour and the dairy product “skyr.” In an Iceland project, local farmers have joined forces with design experts to develop regional foods of the highest quality and traceability, and with direct cultural relevance.

A significant characteristic of New Nordic Food is that it is rooted in a vision integrating all three dimensions of sustainability. The New Nordic Food Manifesto from 2004 describes a vision that involves all parts of society in order to help food become a catalyst for a better environment, better health and well-being, and economic development.

A New Nordic Food initiative that focuses on welfare and health is OPUS – the world's largest research project on the optimal well-being, development and health for children through a healthy diet. The programme is situated at the Faculty of Life Sciences at Copenhagen University. With external funding of DKK 100 million, and in cooperation with hospitals and several public schools, OPUS studies how a Nordic diet can help tackle problems such as obesity and learning difficulties.

Vatnavinir

Iceland as a “sustainable wellness country”

The Vatnavinir – “friends of water” in English – initiative was established in 2008 in the aftermath of the financial crisis by a group of architects, designers and philosophers in order to strengthen the image of Iceland as a “Sustainable Wellness Country.” Iceland’s geography and distinctive network of water arteries and veins inspired the group to join efforts in networks supporting interrelated initiatives for long-term economic regeneration, while applying the idea of sustainable development.



Picture from www.vatnavinir.is

The primary aim of Vatnavinir is to exploit the unique Icelandic resources of geothermal energy and abundance of fresh water to help develop new opportunities for entrepreneurial endeavours related to tourism. Additional aims are to promote “an Icelandic school of thought in relating wellness with nature” and to promote Iceland as a “laboratory for the world in health related tourism.”

Vatnavinir applies a kind of a user-driven innovation approach where projects are initially developed by the group, and then pursued together with collectives and citizens in the form of “self-development projects.” Design thinking and architecture are then used to synthesize the projects with the economic, social and geographic characteristics of a given site.

So far, several innovative projects have come out of the initiative, such as the concept of distinct and site-specific wellness centres and the project of harbour baths in Reykjavik. In May 2011, Vatnavinir received the prestigious Global Award for Sustainable Architecture.

The Business Innovation Fund

Financing demand-driven innovation in green growth and welfare

The Business Innovation Fund (Fornýselsfonden) seeks to strengthen growth, employment and export while improving the environment, climate and welfare. It was established in 2010 on the basis of the former national programme on user-driven innovation (Fonden for brugerdreven innovation). A total of DKK 760 million has been allocated through 2012 for innovation, market maturation and restructuring.

The fund finances projects in three focus areas: 1) innovation that is either user-driven or attempts to develop “system solutions” in preparation for export in green growth and welfare, 2) market maturation in green growth and welfare and 3) support for change-over to exploit new business and growth opportunities in less-favoured areas. The Business Innovation Fund thus stimulates socially or environmentally sustainable market development and innovation. There are, however, few projects tackling environmental and social challenges at the same time.

Green areas include air pollution, water, waste, transport, building and farming; welfare areas include child care, public health, care and education. The change-over, importantly, deals

with the issue of unemployment in less-favoured areas.

Only consortiums with at least three actors can apply for funding. To attract as many high-quality applications as possible, the fund limits bureaucracy in the application process and guides and counsels applicants before they apply.

Another important aim of the fund is to promote demand- driven innovation. In the coming years, it will develop several “intelligent demand” initiatives that use public sector demand to promote innovation in companies.

From 2010 to December 2011 it has dispersed almost DKK 437 million to 95 projects, with the participation of more than 200 companies. Some DKK 137 million has funded innovation-related projects.

5. SWOT Analysis

Relation between the Nordic societal model and innovation in green growth and welfare

Introduction

This chapter provides a SWOT analysis of the relation between the Nordic societal model and the ability to create innovation in green growth and welfare. The analysis is based on interviews with experts and players within the area of innovation in the five Nordic countries.

As the best practices have illustrated, initiatives abound in the public sector in all Nordic countries, and the newest branch is innovation within core areas of public welfare.

The cases exemplify a widespread conviction that the Nordic countries must re-invent the so-called “Nordic model” in order to meet the challenges posed by demography, economy, environment and climate, and not less globalization. Our mapping of innovation strategies finds that three major drivers for innovation are repeated by all governments in the Nordic countries: globalization, climate changes, and the ageing population. This suggests that the approach to innovation in the Nordic countries is on a path towards common objectives and problems.

A review of innovation policies in European and Asian members of OECD shows that those objectives are acknowledged by other advanced OECD countries. In this context, there is also a shared understanding of the need to develop sustainable solutions to cope with the challenges.

At the political level, our mapping of innovation strategies showed that throughout the Nordic countries approaches to innovation are changing. One dimension may be of special importance. All Nordic countries are to varying degrees working towards a more open approach to innovation that involves users, focuses on demand, and adds a societal dimension. Thus, though Nordic Countries have quite different backgrounds, they seem to be moving in the same direction in their approaches to innovation.

It is also becoming increasingly evident that personal lifestyle is an inseparable part of the challenges we face. Our cars, food and houses all generate CO₂ emissions. It is impossible to reduce emissions without considering changes in patterns of transport, food and housing. Food alone is responsible for around one-fifth of Denmark’s CO₂ emissions (See Figure 1). When looking at public health, we also find that fast-rising problems with chronic diseases are linked to lifestyle, where successful treatment does not rely on state-of-the-art hospitals but

on a personal effort to make healthier choices. It is especially evident with epidemic spread of obesity.

The importance of lifestyle underscores the need to develop solutions in cooperation with users. If not, it becomes less certain they will use the solutions as intended. Fortunately, the demanding citizens of the Nordic countries have the abilities to be the best-imaginable partners in the innovation development process in the coming years.

They are well educated, demand good lives and are well adapted to use new technology. An international comparison finds Nordic citizens to be some of the most e-ready in the world (See Figure 2).

“A lot of examples show us that sophisticated market demand and demanding end-users are among the strongest drivers for innovation,” says Jari Romainen, executive policy adviser, TEKES, in Finland.

The Nordic welfare states are facing a similar task to rethink the successes of societies that made them well known globally. It is not just a question of continuing the wave of reforms, but of establishing a new set of relations between authorities, private companies and citizens. The goal is to develop a new model of welfare, not just version 2.0 but version 3.0. That’s why radical changes and innovation are on the agenda; incremental changes are simply not sufficient to meet the enormous challenges.

Positive preconditions must prevail over huge challenges. Owing to pressure to limit public expenditures, enormous climate and environmental problems, ageing populations, and expectations of increasingly better quality, the Nordic welfare states cannot progress by offering more of the same.

Thus there is a need for innovative leaps forward in the Nordic countries’ efforts to create sustainable societies in at least three dimensions: economical, environmental and societal.

The SWOT analysis of the relationship between the public sector and innovation within green growth and welfare shows that even though innovation flourishes in all five Nordic countries, none excels in using the knowledge gained from projects and initiatives on a national scale. It is rare that experience from innovative projects is spread to users in similar situations.

If this is to be overcome, the transfer should be seen an integral part of the project from the beginning. No project should be funded if it cannot show how, if successful, knowledge is to be transferred and adopted elsewhere.

The coming years will be characterized by an ever-more competitive global environment, where countries and companies rush to deliver solutions the Nordic countries want to solve. As our mapping of international trends shows, Germany and The Netherlands have identified the same set of challenges as the Nordic countries. They make massive investments in the search for solutions, in partnership with companies such as Bosch and Siemens. Also advanced OECD countries in Asia, such as Japan, hope to take big steps in areas such as green tech and welfare technology⁽¹²⁴⁾.

(124) See chapter 3

By using the public sector to catalyze innovation within green technology and welfare, the Nordic countries can put themselves in a good position relative to other European and international competitors.

SWOT

The relation between the Nordic societal model and innovation in green growth and welfare.

Strength

- Values and visions
- Good governance
- A history of promoting innovation
- Empowering users and customers
- Trust, flat hierarchies and the power of employees
- Network succeed institutions
- Nordic countries as global test markets

Weaknesses

- Innovation only flourish locally
- Lack of coordination
- Not-Invented-Here Syndrome
- No-failure culture impedes innovation
- Public institutions are rewarded for stable operations – not innovation
- Scale is lacking

Opportunities

- Technology and IT can enable change
- Innovative public procurement
- Fighting fragmentation by rewarding copycats
- Branding Nordic strengths to boost export

Threats

- High costs in Nordic countries
- A crowded market – everybody wants to solve global challenges as climate change and ageing of populations
- Small Nordic markets – global growth lies in Asia
- Actual austerity predominate instead of innovation

Figure: Main findings in the SWOT analysis.

Strengths

Values and visions

At high-level international summits, Nordic countries have a distinguished record of setting sustainability on the global agenda. Based upon an initiative from the Swedish government, the global community recognized the importance of environmental problems for the first time at the Stockholm conference in 1972. Later, in 1987, Gro Harlem Brundtland lent her name to the UN report about Our Common Future, with its definition of sustainability. Most recently, we saw the ambitious attempt in Copenhagen to reach a global agreement to reduce CO₂ emissions.

To cope with the challenges to come, the Nordic countries need to exploit these historical experiences, values and attitudes. It is impossible to cope with climate changes and demanding challenges from air and water pollution without the notion of sustainability. The same is true

for the economic challenges the Nordic countries face. In this respect, the Nordic countries can show a remarkable progress by reforming their public sectors according to a vision of economic sustainability, even when demands are rising and the workforce shrinking. In a radical way, sustainable living can spur reforms aimed at supporting a long-lasting work life, where citizens are able to retire later than today.

Those shared values can be the cornerstone of a new, visionary national or even Nordic innovation strategy in the years to come.

Good governance

The five Nordic countries are, in a global context, characterized by a big public sector commanding a large share of GDP. But an international comparison also shows that the Nordic countries excel in good governance, as the yearly index from the World Bank shows. In this index, good governance includes regulatory quality and government effectiveness⁽¹²⁵⁾.

In any discussion of ageing populations and the predicted increase in public expenditures, the Nordic countries has a record of efficiency. The Nordic countries, for instance, provide a health system with high-quality service at much lower cost than, to cite one example, the United States.

A history of promoting innovation through legislation, norms and standards

Over more than a century, the public sectors in the Nordic region have invested actively in innovation through a remarkable variety of instruments. It is worth noting here that innovation is not only a question of technology; it also attempts to create new patterns of cooperation between partners from the public and the private sphere.

Building regulations

One common and fundamental feature is to establish new markets through regulation. That has often been the case in the housing market, where the first regulation dates back to the middle of the 19th century. Then, it was mainly a question of technical regulation where safety was a concern. Today, the Nordic countries use building regulations as a climate policy tool to cut energy use and CO₂ emissions.

A common feature is that new houses meet rigorous standards, forcing suppliers and entrepreneurs to innovate everything from building materials to building methods. Norway and Finland go a step further, determined to make the public sector a leader with respect to energy efficiency. From 2014 and 2015, for instance, new public buildings in the two countries must be built according to the passive house standard, which ensures very low consumption of energy⁽¹²⁶⁾.

A wide range of projects in Finland use the demands for energy efficiency as a starting point for an entirely new way of planning, constructing and maintaining buildings. The projects abandon the traditional model, which keeps planning, construction and maintenance separate. Cost assessments had, as a rule, been carried out for each separate phase, without assessing or

(125) http://info.worldbank.org/governance/wgi/sc_country.asp

(126) Danish Enterprise and Construction Authority (2011): *Kortlægning af strategier for lavenergibyggeri i EU Lande* (Mapping of strategies for low-energy-construction in EU countries) http://www.ebst.dk/file/146059/energikrav_i_eu_lande.pdf

investigating the life-cycle costs. Evaluation of the cost-effectiveness of a project had therefore mainly been guided by the amount of upfront investment, not operational or life-cycle costs.

Examples of the more holistic approach are the construction of day care centres, an ecological centre of tourism, schools and sports grounds in the municipalities of Haukipudas, Jyväskylä and Kittilä⁽¹²⁷⁾.

The Danish experience with the construction of sustainable buildings shows the same development, from partners acting alone to a more cooperative model of planning, construction and maintenance⁽¹²⁸⁾. Other examples are ESCO (energy service company) projects, where a private partner integrates energy-efficiency in renovation. Under the partnerships, energy savings pay for the renovation of public buildings, freeing municipalities to pursue upgrades at a time of tight budgets⁽¹²⁹⁾.

A host of examples shows that private partners use their ability to handle the requirements as tools in their marketing (Peab in Sweden and Finland).

Wastewater treatment plants

Throughout the Nordic region, countries, municipalities and companies, working together, have developed sophisticated wastewater plants. Environmental standards such as the European Directive on Wastewater Treatment have been crucial in order to establish harmonized standards throughout Europe. But new needs are flourishing in addition to the legal requirements. Reducing smells, or even using sludge as a source of energy, have been added to the list. Here, an ambitious goal will be that plants be net energy producers.

A key point in this development has been that public authorities define and describe their demands, and do so in cooperation with private companies. In turn, private partners should initiate a process to capture hitherto unknown performance wishes – initiating a complex interaction between private companies and their customers, the local municipalities and users.

The need to treat wastewater has laid the foundation for the emergence of companies ranging from high-tech firms such as Krüger (DK) and Kemira (SF) to engineering and consulting firms such as Sweco (S). All have established a strong presence in global markets.

Empowering users

In the Nordic countries, the interplay between authority and citizens is characterized by a high level of trust, when compared internationally. That could catalyze innovation (See Figure 5).

“We have a tradition of involving citizens and users when developing our services. We even regard it as a precondition for success with innovation,” says Dorte Dalgaard, project manager, Region of Southern Denmark.

(127) Tekes: Funded projects: Built-up environment
<http://www.tekes.fi/about/publicprocurements/examples/built-up+environment>

(128) Technical University of Denmark (2010): *Innovation i nyere bæredygtigt byggeri*. (Innovation in sustainable construction)

(129) See, for instance, Monday Morning Denmark (2010): *Sådan Lukkes Klimagabet*

Empowering consumers can be a tool of innovation, and goes both for the development of green technology and welfare technology.

One crucial factor has been the obligation for customers, such as utilities, to buy wind power at a pre-defined but still lower price. The result is well known: two of the leading global wind energy firms are situated in Denmark.

When the focus is on innovation within healthcare and care, public regulations can empower the end-user.

A basic and early instrument is simply to help citizens become customers, improving their quality of life. One example is the three Danish producers of hearing aids, where the history begins in the decades following World War II. Today, they share 40 pct. of the world market. One reason behind the successful development was that any Dane needing a hearing aid was able to get one at no cost, after the public subsidy. Another reason was that producers then and now be required to meet a range of minimum specifications. Finally, companies producing hearing aids could tap knowledge from companies producing acoustic equipment.

Innovation often derives from inspiration sparked when companies meet with customers and users. An example from Iceland is the company Nox Medical, which has developed an “Ergonomic Sleep Recorder” – seen as a response to dominating but uncomfortable devices. Input from employees and patients are crucial in the developing and testing of new ways of organizing the work and creating new technologies.

One example from our cases is the work within the chain of Living Labs. In Halmstad, Living Lab has established a network with elderly patients, relatives, companies and researchers at a university to develop a set of devices enabling the elderly to monitor visitors on a small portable display before they open the door. The device also records how often the door is opened and closed, improving patient monitoring. The product, Lock Assist from Phoniro, is now on sale⁽¹³⁰⁾.

Employees key to innovation

We find one of the best examples of how ideas from employees can impact a big public workplace at the Ideas Clinic at Aalborg Hospital. Over the last two years doctors, nurses, researchers, porters and other employees have come up with more than 300 ideas. Thus far, the result has been 16 patents. The Ideas Clinic cooperates across the borders with Oslo University Hospital, in Norway, and Sahlgrenska University Hospital, in Göteborg. At Södersjukhuset, in greater Stockholm, a similar set up has already resulted in a new, simpler method to take a blood sample from the navel string seconds after the birth.

“I see a fantastic desire to innovate,” Helena Tillborg notes. She is project manager, Teknopol, a public advisor for companies involved in innovation in Lund, Sweden.

In the development of more advanced medical technology, there is a long-standing tradition of cooperation between hospital wards, companies and universities or research institutions. One example from Norway is GE Vingmed Ultrasound, formed out of a request from the Norwegian University of Science and Technology (NUST) and Sintef to develop ultrasound devices in

(130) See Chapter 4.

order to analyze the human heart. Today, the company is part of GE, with development and production facilities in Norway.

“Employees in the public sector all over the Nordic countries can be good at innovation and especially innovation in cooperation with citizens in the one hand and their leaders on the other hand. I think we can draw upon a culture on the workplace and in our societies, which is characterized by openness,” says Paul Chaffey, CEO of Abelia, the business association of Norwegian knowledge- and technology-based enterprises, which is associated with Norway’s largest employers’ organization, NHO.

A new Danish analysis confirms this assessment, finding that nearly all, 88 pct., of public leaders regard passionate and dedicated employees as the most important source of innovation⁽¹³¹⁾.

It is therefore seen as a strength that the perceived power distance between employee and employer is very short in the Nordic countries as compared to other countries. Employees do not feel a steep hierarchy dividing them from their boss. That makes it easier for the average employee to present his or her boss with new ideas to innovate, re-organize or in other ways develop their products, services or processes (See Figure 4).

Networks succeed at innovation

If we take a look at hospitals discharging patients quickly, we find how a mix of changes in technology and organization explain the development.

The economic push is clear: patients should stay in the most expensive beds at the hospitals for as short a time as possible. But, when hospitals deliberately shorten the length of stay, they move not only the patient but also part of the treatment directly into the patient’s home. A precondition is new technology, but the result also depends on a new organizational model, where every patient is situated in a centre of a network, where specialists from the hospital, general practitioners and care in the municipalities share responsibility with the patients for the needed outcome.

The new organizational model, where networks partly replace institutions such as hospitals, is emerging in all Nordic countries.

It could be an advantage that the public sector provides most of the health service in all five Nordic countries. In comparison with the United States and other European countries, there are fewer actors to coordinate in the Nordic countries.

“We have public health care in the Nordic countries. With the right political commitment, we could be in front with innovation of welfare through widespread use of new technology,” says Erland Vinterberg, project manager within assistive technology at Nordens Vælfærdssenter.

It is also worth noting the clusters springing up as new networks between regions, companies and research institutions -- indicating the need to share knowledge in new ways to build up the competences needed to address pressing challenges. If they can grow into a Nordic or

(131) Sørensen, Eva and Jacob Torfing (Eds.): *Samarbejdsdrevet innovation - i den offentlige sektor (Co-created innovation in the public sector)*

international context, research indicates they will last longer and have more impact⁽¹³²⁾.

More generally speaking, the sheer size of the public sector in the Nordic countries underscores the need to link public procurement with innovation.

Nordic countries as global test markets

There is a longstanding tradition of public institutions testing new products in the Nordic region. This is especially true of the collaboration within the pharmaceutical industry and of municipalities and companies working together to develop and test new wastewater treatment solutions. Today, the municipality of Faaborg-Midtfyn, in Denmark, is cooperating with Japanese firm Tmsuk, a spin-off from Sanyo, to test robot technology in care units.

During the last three years, more than 300 buses in greater Helsinki have operated partly or wholly running on biofuel. The project is an example of how public companies can act as test beds for private firms to develop new products. In Helsinki, the aim was to test biofuel developed by Neste Oil to see if it was fully compatible with traditionally diesel. Neste regards the project as a success, and Helsinki Region Transport (HSL) has integrated demands to use biofuels in tenders⁽¹³³⁾.

Weaknesses

Innovation only flourishing locally

When you take a look at innovation in the public sector throughout the Nordic countries, you can visualize a medal. On one side it is bright, shining and promising; on the other, it is dull, has lost a bit of its lustre, and you face the problem of harvesting the fortunes promised on the front.

“In the public sector we can easily find innovators with an impressive commitment to their work and to the innovation, they fight for. But in the end, it is extremely difficult to use their experiences on a regional or national level. It’s all too rare, when it happens,” says Paul Chaffey, CEO Abelia.

Alas, there is not one but a plethora of reasons to explain the missing links between innovative projects all over the Nordic region and their effects on a national scale.

One is that municipalities often organize innovations in specially designed projects, separated from daily operations. That is the experience of Birthe Dinesen, associate professor at the Department of Health Science and Technology, Aalborg University.

To better establish the link between project and widespread practice, she initiated Telekat, in Aalborg, directed at patients with chronic infection of the lungs (COPD). This patient group alone accounts for 20 pct. of all emergency admissions, with a high re-admission frequency. To avoid re-admissions, patients participating in Telekat monitor themselves in cooperation with home-nurses, the general practitioner and, occasionally, specialists at the hospital.

(132) See Chapter 4.

(133) Neste Oil (2011): *Excellent results from biofuel trial involving Neste Oil, Helsinki Region Transport, and Proventia: significantly reduced local emissions*

Even though new networking technology is a precondition for projects like Telekat, the main focus has been to establish the network and the cooperation between the specialists from hospitals (region), general practitioners (private) and home nurses (municipal). Throughout the process, one challenge has been that professionals have to let go of their inclination to handle the problems for the patient. In the project, they have assumed a new role as coaches. Such a large transformation demanded special attention during the project.

As measured by a fall in re-admissions of around 50 pct., the project is a success. Participating patients report satisfaction and more peace at mind, knowing they can monitor themselves. Yet to be proven is whether the Telekat case can be scaled up. But, planners are about to try. Telekat is to be tested throughout the North Denmark Region, where Aalborg is the “capital.”

“The big challenge is always to test innovations on a larger scale. There is a promising business case in the Telekat-project and that’s a strong incentive for us. But it is also convincing, that the patients report they feel more comfortable in their everyday life, partly because they don’t have to rush to the hospital all too often,” says Dorte Stigaard, director for regional development and innovation in the North Denmark Region.

The tendency to separate innovative projects from daily operations can be overcome, but is difficult. Innovative projects are often financed with temporary funds, earmarked for a specific purpose. Funding dedicated to the transfer of experience and knowledge from one project to a regional or national setting is lacking.

Fragmentation – lack of coordination

One other problem that explains the problems of scaling is that there is no coordinated collection of experiences and knowledge gained from the various projects. That’s the case within countries and, even more so, between the five Nordic countries. As the Telekat case shows, the transfer from project to regional practice is easier done within the same region. There exists virtually no information about projects in other parts of Denmark, which is also the case in other Nordic countries.

“Public sector innovation is characterized by fragmentation. We do not collect experiences from the projects and we don’t distribute them in one way or the other. On top of that comes the problems, when EU is co-financing projects, then we have to find partners in other parts of Europe, and that makes the problems with passing on the experience gained even more complex to solve,” says Helena Tillborg, from Teknopol, in Sweden.

Even though the partners participating in the project share knowledge and experiences, they do not often as a group share the collected knowledge with other operators. Here the Danish programme for user-driven innovation is an example of knowledge gathering.

Not-Invented-Here Syndrome

Innovation often happens with inspiration gleaned from the outside. But only one in seven public institutions in Denmark have a formalized practice of scanning other public organizations, research institutions or universities and private companies for inspiration⁽¹³⁴⁾.

(134) Sørensen, Eva and Jacob Torfing (Eds.): *Samarbejdsdrevet innovation - i den offentlige sektor (Co-created innovation in the public sector)*

“I think most innovation is about using existing ideas in a new context and at best adapt them to your own needs. It begins with curiosity and that’s what I see all too rarely. And we hope that a new wave of innovation in a network between the public and private enterprises can create new export-wonders. We risk, that innovation takes place in other countries and that they will push us out of the market,” says Paul Chaffey.

Whereas most competitive private companies have integrated innovation into their organization and have established incentives to promote innovation, most public institutions focus on operational practice. This habit sometimes directly opposes innovation.

“Public institutions have little by little built up a ‘play-it-safe’ culture, where they seek to avoid any kind of failures and mistakes. That’s a huge obstacle to innovation,” says Dorte Stigaard, who points out that the consequences are to be found in internal practices, and when public institutions choose external partners. These partners will also have to fit into a pattern of stability, which gives long-established firms an advantage over younger firms, as for instance in the venture segment.

The play-it-safe or zero-failure culture is antithetical to innovation. The public sector will have to find a new balance between areas where they have to play it safe (some departments in the health care system) and others where there is room for experimentation.

Private companies, in contrast, have integrated a policy for innovation. Even though the incentives in the private sector differ enormously from the public sector, innovation in private companies can be of inspiration, simply because they are born with a wish to grow from project to market. A way out for public projects would be to locate the person or the institution responsible for the transfer.

Public institutions are rewarded for stable operations – not innovation

The preoccupation with operations, and not with innovations, is also a question of management and competencies.

When it comes to management, most managers focus on the status quo – as they well know, they are seldom awarded for taking risks. The incentives support the status quo, not innovation. One example is the public procurer. He or she will be rewarded if innovative procurement turns out to be a success; on the other hand, he or she will meet severe criticism, on a much larger scale, if it fails. The result: an inclination to stick to, and not challenge, established routines.

On competencies, it is striking that a typical engineer is trained as an innovator, yet that is rarely the case for a nurse or a teacher. According to Birthe Dinesen, there is simply a lack of innovative skills in the Nordic society. She suggests that innovation be integrated into the educational system beginning with public schools. If there is to be a fruitful connection between engineers and public sector employees they will both have to develop an understanding of their partner, their needs, their competencies, and, not least, the actual potential for innovation.

One way to do so is by building up new setups for educational institutions such as the Finnish Aalto University. Another is to integrate knowledge about how to work with users in innovative processes, as happens in the masters program on Design and Innovation at the Technical

University of Denmark.

When cooperating with private companies on innovative solutions, public sector officials often lack insight into what private companies need to innovate. In this respect, there remains a world of difference between the public and the private sectors.

Is small beautiful? – Scale is lacking

On a global scale, the Nordic countries are small, even the most populous, Sweden, has less than 1 pct. of the population in India.

On big-scale innovation, there could be a problem of funding – at least if each Nordic country goes alone in search for new platforms in a competitive environment.

“Green growth and innovation often requires huge resources, which is lacking in the small Nordic countries,” says Pekka Ylä-Anttila, manager at ETLA, the Research Institute of the Finnish Economy.

He argues that closer cooperation on innovation between the Nordic countries could better position them in the race to deliver solutions to globally acknowledged problems.

Opportunities

Enabling technology

Scarce resources constitute an important driver for innovation in the public sector. The Swedes, and soon also the Danes, will implement annual ceilings defining the size of the public share of GDP, making it difficult to launch new services.

Innovation is one of the most meaningful ways out of that squeeze. In this process, technology, and especially ICT, enables changes hitherto impossible, or dismissed as too expensive, because of diminishing costs and the fact that innovative solutions open up new ways of solving public challenges.

One example is the use of mobile technology in telemedicine. A nurse can take a photo of foot ulcers in the home of a diabetic patient and MMS them to the specialist at the hospital in order to discuss possible treatments on the spot. That reduces the need for a hospital visit, it improves treatment, and it reduces costs for society. There will be less need for transportation, and, in the end, fewer surgical amputations of the attacked foot (See Chapter 4).

Technological progress is also a precondition for new ways of solving environmental problems. One main problem is water quality, where agriculture is responsible for acidification and consequential health problems for citizens⁽¹³⁵⁾. Technology can turn the problem with slurry and acidification into a new resource, biogas, thus creating new “power plants” and jobs in rural areas, where agriculture hitherto has been the most important employer.

In the Swedish network, Cleantech Inn, new companies emerge like small flowers in the

(135) Centre for Energy Environment and Health (2011): *CEEH Scientific Report No 3*

spring. A handful of entrepreneurs provide an example: Products from one company, Flinga Biogas, can transform organic waste to biogas; another company BioPrePlant uses food waste from households as their biogas source; and Bioprocess Control offers solutions to improve the biogas production process.

Where technology constantly creates new possibilities, and can be seen as a positive driver for innovation in the public sector, a negative driver for innovation is the debate over economic resources measured against growing needs.

Innovative procurement

The public sector in the five Nordic countries spends approximately DKK 900 billion each year on goods and services, which gives the public power to affect markets.

In some respects, it is already happening. The three Nordic EU countries are leading the effort to make public procurement greener, as a decision from the European Council of Ministers in 2010 directed.

Seen from an innovation perspective, it shows that public procurers are not forced to pick the cheapest solution on the shelf; other goals can be achieved through procurement. One analysis showed that greener procurement can be more cost effective than procurement without that focus⁽¹³⁶⁾ (See Figure 6).

The five Nordic countries have all set up strategies for stimulating innovation through public procurement. A few examples have proven that innovative procurement is a convincing alternative to the traditional alternative. One example is the project on smart houses in Oslo under the National Program for Supplier Development. Here the demands for the houses are specified on the basis of needs of the elderly, not predefined care-solutions, and through dialogue with suppliers (See Chapter 4).

This tendency could be boosted by the forthcoming revision of the EU directive on public procurement, combined with a more flexible interpretation of the existing legal framework in all Nordic countries.

It is also a question of perspective. When resources are scarce it is tempting to focus on actual or short-term benefits. But even then, looking at the challenges the public sector faces, procurement should be seen as an investment, not just as expenditures. This quest for a lifetime analysis of procurement could change existing routines.

Here one instrument is to distinguish between shelf goods, such as pencils and paper, where the demand for innovation is small, and more advanced equipment, where new procurements could have consequences not only at the institution or ward in focus, but also impact partners. An example could be new equipment at hospitals that can diagnose faster, reducing waiting time and benefiting patients and municipalities.

One way of establishing innovative procurement could be that officials define needs instead of predefined solutions. That will turn most public procurement upside down, opening the door

⁽¹³⁶⁾ PriceWaterhouseCoopers, Significant and Ecofys (2009): *Collection of statistical information on Green Public Procurement in the EU*

for private companies to compete on how to solve problems, and not only on how to meet pre-defined obligations most cost-effectively.

It is also important that public institutions define long-term visions for procurement in order to guide operational decisions in a way other than done today, where cost is the dominant criteria.

Defined in that way, public procurement could be a driver for innovation in green growth and welfare with respect to new technology, and with respect to new ways of organizing and delivering service.

Rewarding copycats

Looking at the problem of scaling innovation in one part of the public sector to all parts of the public sector, Helena Tillborg suggests that one tool could be to reward copycats. At first glance, it seems to contradict decency. But a deeper look into the problems with transferring innovation shows that public sector institutions are very sceptical towards innovations made by colleagues in other parts of the country because of an informal dictum saying “not-invented-here, not-used-here.”

“When I meet public leaders, they know best practice. Paradoxically, they imagine that best practice will not suit them and their needs. There is a strange tradition in the public sector saying, that you prefer you own inventions,” says Thomas Børner, managing director of The Foundation for Public Welfare Technology.

BRIDGING THE GAP BETWEEN INNOVATIONS AND PRACTICE

Most incentives point in the wrong direction, if the aim is to transfer best practices from projects to national practice. That’s one main reason behind the founding of The Foundation for Public Welfare Technology in Denmark.

One criterion for support is the possibility to transfer good results. The Foundation either supports new technology/new models of management, or the implementation of well-known technology in a new context. By doing so, management, competencies and culture at the workplace has to follow suit.

Source: <http://www.abtfonden.dk>

Singapore actively promotes copying good ideas. When searching for new solutions, the Singaporeans scan solutions in other areas of public administration, or in other countries, to find best practices and transfer the most vital parts to Singapore. One leading sociological scientist in Singapore, professor Neo Boon Siong, at Nanyang Business School under Nanyang Technological University, says that “between 70 and 80 pct. of our policy builds on experiences from other parts of our administration or from abroad.”

Branding Nordic strengths to boost export

From a global perspective, the five Nordic countries have an outstanding reputation in addressing environmental and societal problems. Why not brand the Nordic countries as frontrunners, as Helena Tillborg suggests. Another possibility is to market Nordic countries as test beds for new products due to the e-readiness of citizens and public servants.

Threats

High costs in Nordic countries

The Nordic countries like to picture themselves as five beautiful, white swans, gliding through the deep blue sky. But the remarkable innovative power placing Denmark, Finland and Sweden in top positions in European and international rankings has less to do with the elegant swan and more with the bumblebee: Even though it's too heavy, it manages.

Taking a look at costs, the Nordic countries find themselves in a less encouraging place atop the international rankings. Ten years ago, the picture was quite different. Costs were high in the Nordic countries, but, in 1997, the Nordic countries shared the position with many other European countries. Since then, costs in the Nordic countries have grown faster than in most other countries.

It means that Nordic countries are less competitive globally and compared to European countries with similar challenges. Germany is the best example of a European country that has been able to hold down costs. As a result, Danish companies are moving production facilities to Germany (See Figure 6).

Over the same period, companies in all Nordic countries have moved production overseas. In Finland, this has been the case for many of Nokia's subcontractors.

One example is the Finnish company Salcomp, delivering chargers to Nokia, amongst other companies. Today, Salcomp leads the market for chargers, and is, measured purely in economic terms, a success. But seen through Finnish glasses, it is not as successful. All production was moved to other countries and research and development followed. It is now performed at a factory in Shenzhen, in China, where 130 engineers develop the charger of the future.

At the headquarters back in Finland, just 25 engineers remain (See Figure 7).

The history of Salcomp has initiated a comprehensive discussion of how Finland should survive as high-class society in the years to come. There is widespread fear that companies start by moving production, and then follow by moving research and development facilities, abroad.

At the same time, Nordic companies are reacting to the shifting patterns in global demand. With the notable exception of Turkey, most OECD countries are expected to grow at lower annual rates than China, India and Brazil. The biggest companies now regard China as their second home market, expecting to enjoy another decade of sustained growth. And if they prioritize markets other than China, they are likely to be India, Brazil or countries of the next tier, including Turkey.

It is therefore not a given that when Nordic countries want to support and spur innovation on green growth and in welfare that they will be able to find the relevant companies within the national borders. Either because companies have moved innovative skills to other places in the world, or simply because they do not deem the Nordic and European market as attractive as the markets in China, India and the other growth economies.

The Red Ocean – Small Nordic markets while global growth lies in Asia

Radical innovation is about creating new products or new solutions, and, with them, swim in a blue ocean, where competitors are non-existent. But, neither green growth nor welfare innovation is in itself a safe ticket to the blue ocean. Even though the Nordic countries have pioneered green growth and the evolution of a welfare society, they share global challenges and a global demand for solutions.

During the economic crisis, it is not the Nordic countries, but China, Korea and to a certain extent the United States that have dedicated the largest chunk of recovery money to green growth. Looking to welfare, companies like Intel and General Electric have joined their efforts in order to deliver the framework for homecare. Another example: Right now the biggest companies in the world have formed an alliance, Continua, to develop the new Wi-Fi-like standard to guide innovation within welfare technology. Apart from Nokia, members are found in non-Nordic countries: Microsoft, IBM, Siemens, Bosch, Sony, Philips, Panasonic and Samsung. The membership indicates that international companies want to grab their share of the growing market in homecare technology.

“The Nordic countries tend to forget that they share the challenges with demography with countries like China and Japan. They may be faster than the Nordic countries on the way from recognizing problems to the goal of offering ways to solve them,” says Paul Chaffey.

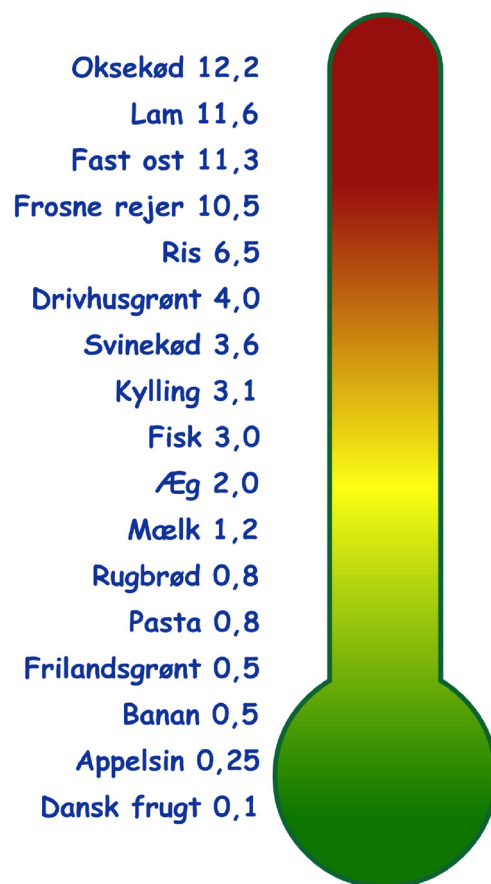
Austerity predominates instead of innovation

Looking ahead, into the next ten years of austerity, it is far from a given that politicians will invest the needed resources in innovation. The quest to satisfy voters can overshadow the needs to focus on longer perspectives.

Politicians need to highlight the importance of creating sustainable societies. All the Nordic countries are on the road to establishing sustainable economies and have taken some steps in the direction of creating environmentally and personally sustainable societies. A vision like that could drive the needed changes in public institutions and personal behaviour.

Figures

Figure 1: Lifestyle behind CO2 emissions
Kg CO2 pr. kg produkt



Vegetables, fruit and bread emits less CO2 during production than meat.

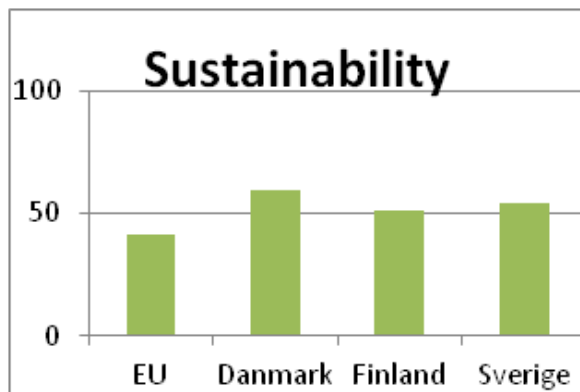
Source: <http://www.klimavenligmad.net/CO2-termometeret/>

Translation from the top:

Meat, Lam, Hard Cheese, Frozen shrimps, Rice, Greenhouse vegetables, Pork, Chicken, Fish, Eggs, Milk, Rye Bread, Pasta, Vegetables (outdoor), Bananas, Oranges, Danish Fruit.

Figure 2: Nordic citizens want sustainability
Nordic Citizens about environment and sustainability

Y-axis = pct.



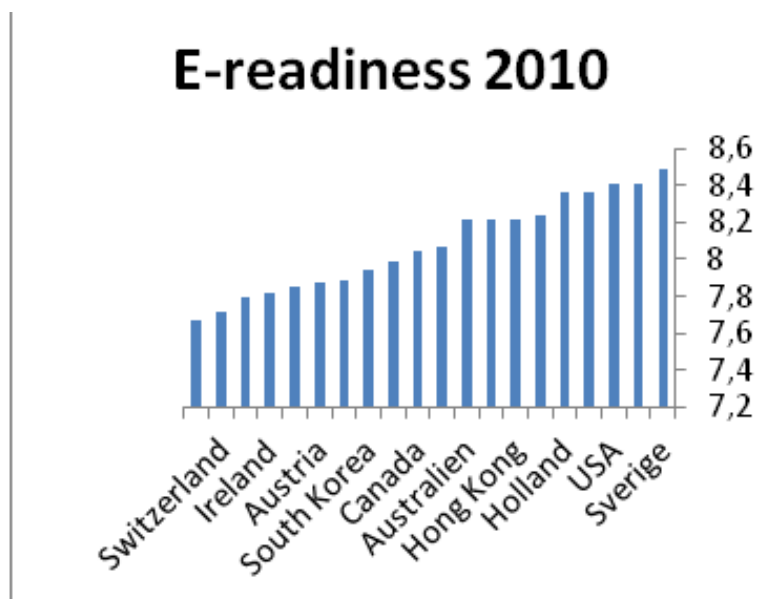
Citizens in the three Nordic EU-countries expects more in relation to sustainability than citizens in other EU countries.

Source: Eurobarometer (2011): *Attitudes on Data Protection and Electronic Identity in the European Union*

Note: Environment/sustainability reflects answers to the question: What do you relate to environment: Sustainability as the environmental status, your kids will inherit

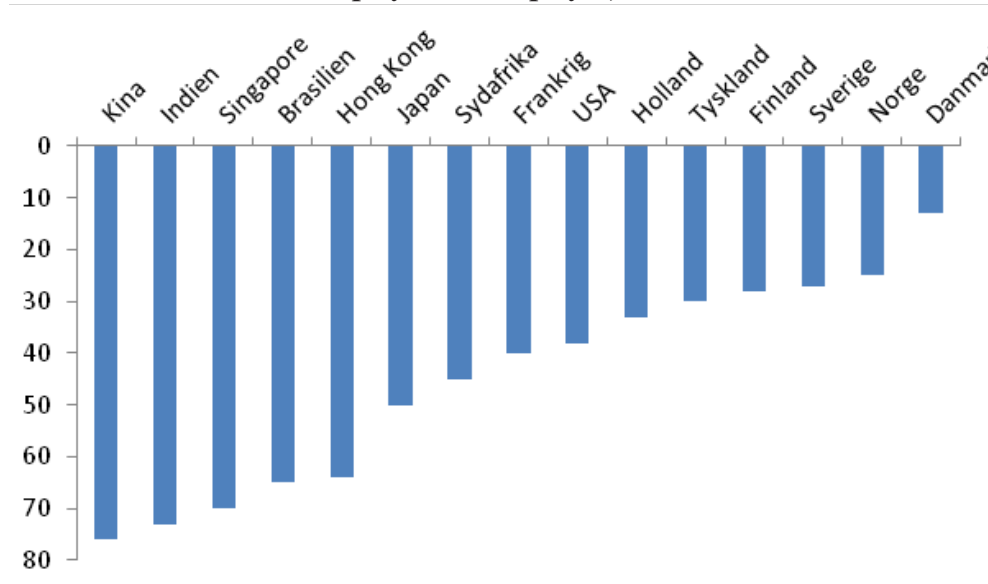
Figure 3: E-ready Nordics
Sub header: E-readiness, 2010

Y-axis: point



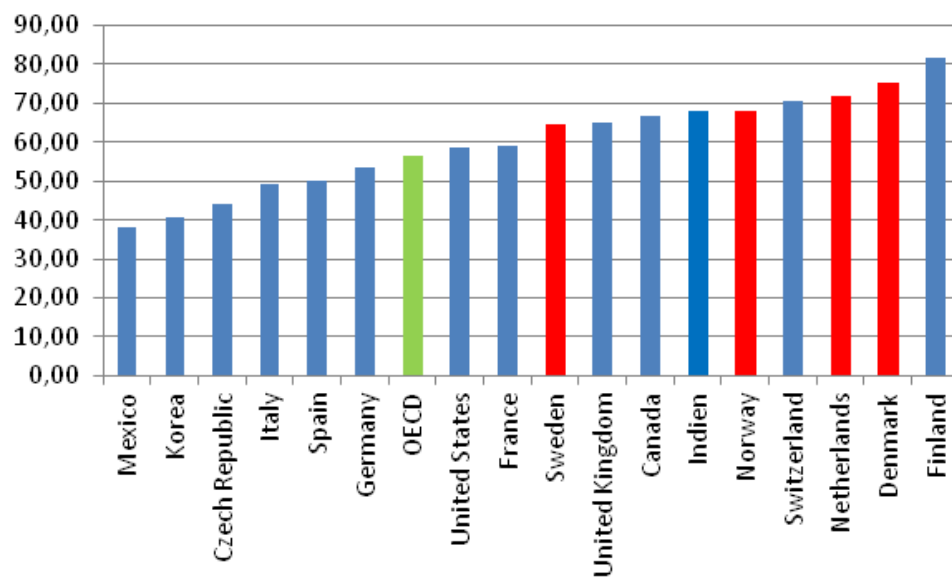
Citizens in Nordic countries eager to use mobile phones, Internet and other ICT. Their use places them in the global top.

Source: Economist Intelligence Unit (2011): *Digital economy rankings 2010 – Beyond e-readiness*

Figure 4: Short distance to the boss**Power distance between employee and employer, selected countries**

Citizens in the Nordic countries enjoy shorter power distance than citizens in other countries, especially citizens in the growth economies in Asia.

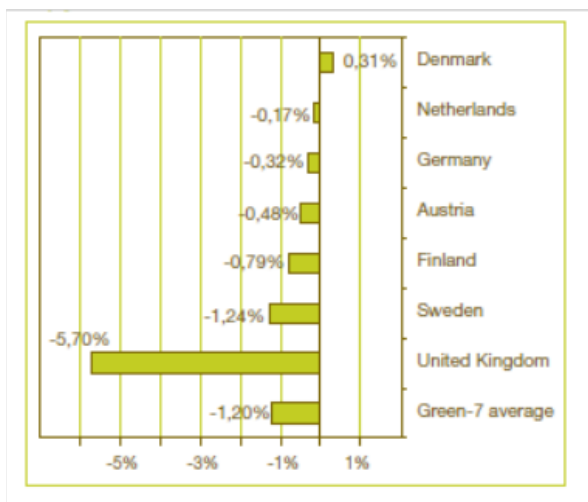
Source: <http://www.geert-hofstede.com/>

Figure 5: Trustful Nordics**Citizen trust in national institutions, max. score = 100**

Nordic citizens in global top ten, when Gallup asks for trust in national institutions.

Source: OECD (2011): *Society at a Glance 2011 - OECD Social Indicators*

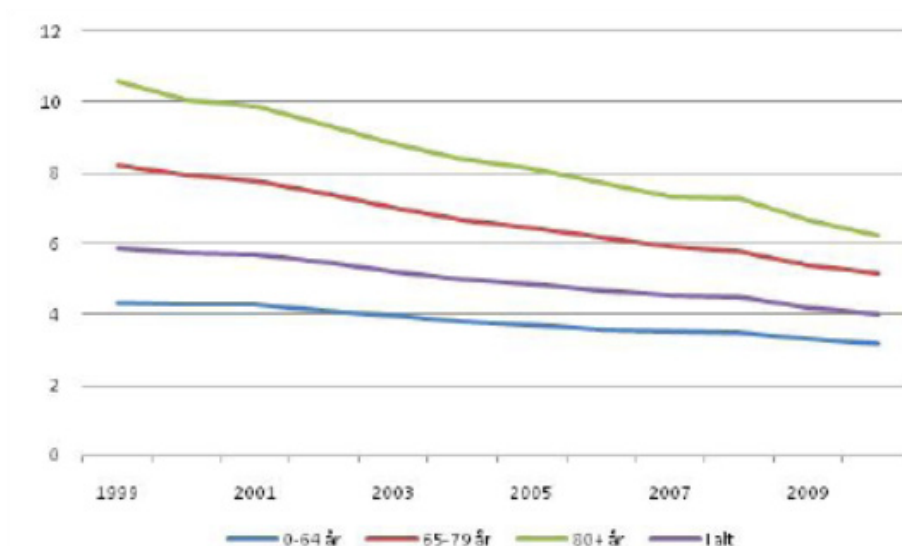
Figure 6: Green procurement saves money
Financial impact of green procurement, 7 EU countries with most GPP



Apart from Denmark most countries save money through green public procurement

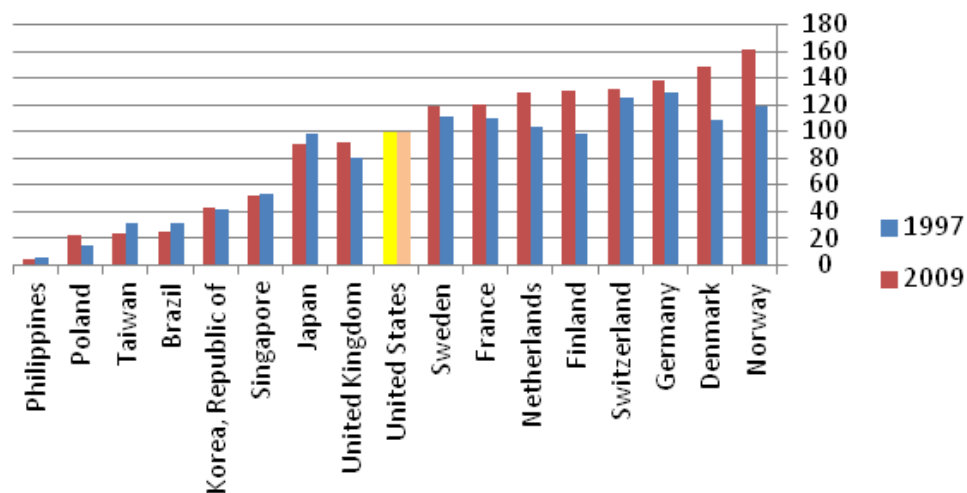
Source: PricewaterhouseCoopers, Significant and Ecofys (2009): *Collection of statistical information on Green Public Procurement in the EU*

Figure 7: Hospitals releasing patients faster
Average duration of hospital stay, somatic patients, 1999 - 2010



Hospitals dismiss patients still faster. It has been particularly evident for the elder and more demanding patients.

Source: Local Government Denmark (2011): *Et sundhedsvæsen i verdensklasse? - Ikke uden kommunerne (A world Class Health Care System? Not without the local governments).*

Figure 8: Expensive swans**Relative hourly cost per employee 1997 and 2009, USA = 100**

Cost has grown faster in the Nordic countries since 1997.

Source: US Department of Labor (2011): *Charting International Labor Comparisons 2011*

Figure 9: A story of outsourcing**History of Salcomp, once a Finnish Company (1975- 2010)**

1975	Salcomp's Kemijärvi plant is founded
1982	Manufacturing of power supplies begins
1983	Acquired by Nokia
1988	The world's first switch mode quick charger for mobile phones
1995	A strategic decision to focus on mobile phone power supplies
1998	Contract manufacturing begins in China
1999	Spin-off from Nokia and expansion of customer base to all major mobile phone manufacturers
2002	A production plant in China
2004	Production in Kemijärvi ends
2005	A production plant in Brazil
2006	Stock exchange listing
2007	Launching of a plant in India, the billion charger milestone exceeded
2008	Extended R&D centre at the China plant
2009	New local offices set up in Taipei, Taiwan and Tokyo, Japan

Salcomp employs 10,350 (2010), 57% in China, 27% in India, 17 % in Brazil and 1 % in Finland.

Source: www.salcomp.com

6. New Nordic Innovation – a common platform

The Nordic countries are aiming high with the challenges to be met through new innovation policies. Globalization, climate change and the ageing population are indeed global, and the reward for contributing to solutions can be very big. The aim of a New Nordic Innovation policy will be to link innovation capacities with these challenges and turn them into opportunities for Nordic countries and businesses. But this is not enough. If societies are to become sustainable, they will need an innovation policy that exploits the great potential for synergies between economic, social and environmental challenges (See Figure 1).

This entails a shift from viewing our Nordic model as discrete welfare *states* to seeing them as welfare *societies*. Whereas welfare states mainly focused on the social dimension of sustainability, the larger societal model deals with social challenges together with the economic and environmental issues. The shift is a prerequisite for finding the synergies between green growth and welfare and presenting them as opportunities. Welfare societies see social services not only as means to tackle social challenges such as ageing and social exclusion but also as means to enhance the national competitiveness, empowering people with human capital. Looking at it another way, it is about the public sector inviting other actors – companies, NGOs and citizens – to help solve social challenges by providing new technology and solutions.

As the public sector commands a substantial part of GDP in the five Nordic countries, the public sector is an important actor in the development of new strategies for sustainable innovation. At the same time, the public sector is a big market and that's why public procurement could be turned in to a powerful tool for innovation.

Likewise, the public sector should “think green” in its social services and become a leader in securing a sustainable and healthy environment. We also need to think of environmental sustainability as a welfare issue. The “Telemedicine” and the “New Nordic Food” cases show that synergies between green growth and welfare *do* exist. But they need to be found, nurtured and shared. Today, awareness of the synergies between innovation in green growth and welfare does not exist, and the few initiatives that do establish a connection do so coincidentally. Innovation abounds in the Nordic region, but it needs to have a stronger focus.

A New Nordic Innovation policy should become a major driver promoting this shift, placing itself in the centre of the sustainability triangle. It should involve all sectors of society in solving the wicked societal challenges, and it motivates the public sector to become a driver through measures such as public procurement, R&D, smart regulation, cluster creation, user-involvement, provision of test markets, and scaling.

Recommendations for strengthened Nordic cooperation

In three areas, new cooperation can support the Nordic countries in their effort to reform innovation and innovation policies in order to meet pressing challenges.

- 1. Sustainable innovation.** There is a need to develop a new Nordic framework for innovation that follows the three aspects of sustainable innovation – economic, environmental and social. A key issue here is that the public sector acknowledges it's responsibility for innovation and for the need to embed sustainability early in the innovative process.
- 2. Scalable innovation.** One challenging finding in the SWOT analysis was that innovation in the Nordic region is fragmented. Too many good examples of innovation are not adopted on a wider scale. The picture from above is of innovation as if it were fenced in.
- 3. User- and employee-driven innovation.** The Nordic countries distinguish themselves from most other countries with a high level of trust and a comparably low power distance at work. Features which may be developed and nurtured as particularly Nordic strengths in innovation.

Sustainable innovation

If sustainability is an add-on, and not integrated in new innovative projects at the outset, it most likely will result in extra costs. In the planning for the New Karolinska Solna University Hospital, in Stockholm, sustainability has been included from the beginning. As a consequence, life-cycle analyses informed decisions on building materials and energy use. As a result of energy savings, operating costs can be reduced.

But viewing the Nordic landscape of new innovative projects, few follow the lead of this inspirational project from Sweden.

There is a need to develop a new Nordic framework for sustainable innovation – and to embed sustainability early in an innovative process.

Scalable innovation

There is a fantastic desire to innovate in the public sector in the Nordic countries. But in too many cases, innovations in institutions are not spread to other, even similar, institutions. There is a great need to share the innovations created. Today, barriers holding back innovation seem to be stronger than incentives promoting them. This has to change.

A new Nordic model of innovation should define requirements to spread the results of successful projects.

User- and employee-driven innovation

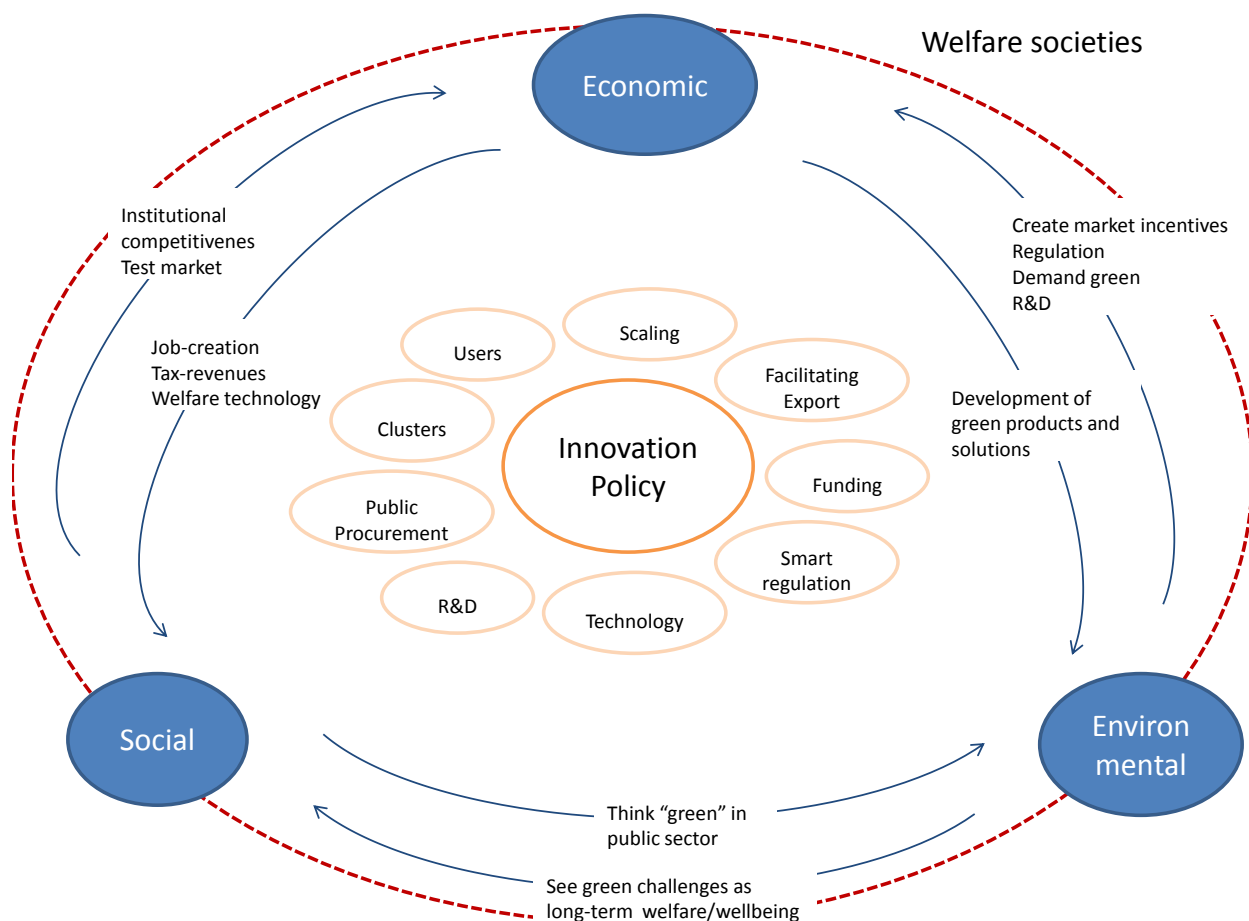
Innovation has to meet the needs of users since behavioural change is necessary if the challenges in focus are to be addressed with success. Real solutions are not only a question of technology but of enabling citizens, companies and institutions to alter routines and behaviour.

In this process, the well-educated and open-minded citizens of the Nordic countries can be

of immense value to public institutions and private companies. The ability to open up the innovation process and include a variety of stakeholders, notably professionals and users, in the development of new solutions is the key to success, as it increases the ability to target needs better.

A common effort from the Nordic countries may be developed to ensure a new foundation for innovative projects.

Figure 1: New Nordic Innovation



Sources

- Business Innovation Fund (2009): *Fakta om Fornyelsesfonden* (Facts about the Business Innovation Fund)
- Business Innovation Fund (2011): *Midtvejsstatus – August 2011* (Midterm status).
- Centre for energy Environment and Health (2011): *CEEH Scientific Report No 3: Assessment of Health Cost Externalities of Air Pollution at the National Level using the EVA Model System*. Report, March 2011. www.cee.dk
- Conferderation of Danish Industries (2011): *Offentligt-Privat samarbejde – redegørelse 2011* (Public-private partnerships – Account 2011).
- Council for Science and Technology Policy (2010): *Japan's Science and Technology Basic Policy Report*. December 24, 2010
- Country Brand Delegation (2010): *Mission for Finland! - How Finland will solve the world's most wicked problems – consider it solved! Country Brand Report*
- Damvad (2010): *Kortlægning af virksomheder, der producerer velfærdsteknologi og service*. Report for Region Syddanmark og Odense kommune
- Danish Council for Technology and Innovation (2008): *Strategi for styrket innovation i den offentlige sektor*.
- Danish Council for Technology and Innovation (2010): *InnovationDanmark 2010-2013 - Viden til virksomheder skaber vækst. Handlingsplan* (Knowledge for businesses creates growth).
- Danish Enterprise and Construction Authority (2009): *Program for Brugerdreven Innovation – Faktaark* (Programme for User-driven Innovation – fact sheet).
- Danish Enterprise and Construction Authority (2011): *Kortlægning af strategier for lavenergibyggeri i EU Lande* (Mapping of strategies for lowenergy-construction in EU-countries). Report, February 2011
- Danish Enterprise and Construction Authority (EBST) (2009): *Faktaark – Program for Brugerdreven Innovation*. 26 October 2009
- Danish PWT Foundation (2010): *ABT-fonden årsrapport 2010. De første projekter – Afsluttende projekter 2010*.
- Dithmer, Michael, Permanent Secretary of State, Danish Ministry of Economic and Business Affairs (2011): *Speech at the Conference on the Modernisation of EU Public Procurement Policy*. Brussels 30 June 2011.

- Dutch Ministry of Economic Affairs, Agriculture and Innovation (2008): *Towards an agenda for sustainable growth in productivity*. June 2008
- Economist, The (2011): Samsung: *The next big bet*. 1 October, 2011
- Economist Intelligence Unit (2011): *Digital economy rankings 2010 – Beyond e-readiness*. Report, The Economist in cooperation with IBM
- Eurobarometer (2011): *Attitudes on Data Protection and Electronic Identity in the European Union*. Special Eurobarometer 359, June 2011
- European Commission (2009): *INNO-Policy Trend Chart – Innovation Policy Progress Report Iceland*.
- European Commission (2009): *INNO-Policy TrendChart – Innovation Policy Progress Report – Finland*.
- European Commission (2009): *INNO-Policy TrendChart – Innovation Policy Progress Report Norway 2009*.
- European Commission (2009): *INNO-Policy TrendChart – Innovation Policy Progress Report Sweden 2009*.
- European Commission (2009): *INNO-Policy TrendChart – Innovation Policy Progress Report Germany 2009*.
- European Commission (2009): *INNO-Policy TrendChart – Innovation Policy Progress Report Netherlands 2009*.
- European Commission (2009): *INNO-Policy TrendChart – Innovation Policy Progress Report Japan 2009*.
- European Commission (2010): *Europe 2020 – A European strategy for smart, sustainable and inclusive growth*. COM(2010) 2020
- European Commission (2011): *Green Paper on the modernisation of EU public procurement policy – Towards a more efficient European Procurement Market*. COM(2011) 15 final.
- European Commission (2011): *Innovation Union Scoreboard 2010 - The Innovation Union's performance scoreboard for Research and Innovation*. 1 February 2011.
- Eurostat: <http://epp.eurostat.ec.europa.eu/>
- Federal Ministry of Education and Research, Germany (2010): *Federal Report on Research and Innovation 2010*. Abstract.
- Federal Ministry of Education and Research, Germany (2010): *Ideas. Innovation. Prosperity. High-Tech Strategy 2020 for Germany*. Federal Ministry of Education and Research, focus, 2010
- Finnish Ministry of Employment and the Economy (2010): *Demand and User-driven Innovation Policy. Framework (Part I) and Action Plan (Part II)*.
- Finnish Ministry of Employment and the Economy (2010): *Demand and User-driven Innovation – Framework and Action Plan*. 48/2010
- FORA (2011): *How Public Procurement can stimulate Innovative Services*. Report to Nordic Innovation Centre (NICE), February 2011.

- Forsknings- och Innovationsrådet Skåne & Soundingboard Innovation i Skåne (2011): *En Internationell Innovationsstrategi för Skåne 2012-2020* (An International Innovation Strategy for Skåne). 28 September 2011
- Gjoksi, Nisida (2011): *Innovation and sustainable development - Linkages and perspectives for policies in Europe*. ESDN Quarterly Report June 2011. European Sustainable Development Network
- Gjoksi, Nisida (2011): *Innovation and sustainable development: Linkages and perspectives for policies in Europe*. ESDN Quarterly Report June 2011.
- Government of Denmark (2010): *Styrket innovation i virksomheder* (Strengthening Innovation in Businesses).
- Government of Denmark (2011): *Et Danmark, der står sammen – Regeringsgrundlaget 2011* (Denmark Sticking Together – Government Platform 2011).
- Government of Finland (2009): *Government's Communication on Finland's National Innovation Strategy to the Parliament*. March 2009
- Government of Iceland (2009): *Government Policy for Ecological Procurement – The State as an informed and ecologically minded buyer*. March 2009.
- Government of Japan (2006): *Science and Technology – The 3rd Basic Plan*. March 28, 2006.
- Government of Sweden (2004): *Innovative Sweden – A strategy for growth through renewal*. Ds 2004:36.
- Government of Sweden (2008): *Ett lyft för forskning och innovation* (A boost for research and innovation). Strategy for 2009-2012. Regeringens proposition 2008/09:50.
- Government of Sweden (2010): *En strategi för ökad tjänsteinnovation* (A strategy for increased service innovation). Promemoria. 2010-07-08.
- Government of Sweden (2011): *Ett nationellt råd för innovation och kvalitet i offentlig verksamhet* (A national council for innovation and quality in the public sector). Dir. 2011:42.
- Government of Sweden (2011): *Uppdrag angående social innovation i vården och omsorgen om de mest sjuka äldre samt utbetalning av medel* (Strategy on Social Innovation in the Health Care and Care of the Most Ill Elderly and the Disbursement of Funds). 2011-06-16. Regeringsbeslut II:10, S2011/5887/FST (delvis).
- Icelandic Centre for Research (2010): *Building on Solid Foundations: Science and Technology Policy for Iceland 2010 – 2012*. Prime Minister's Office
- Icelandic Centre for Research (2011): *Research & Development in Iceland 2011*.
- Icelandic Centre for Research (2011): *Klasasamstarf á þremur sviðum; „Betri lausnir fyrir minna fé“* (Cluster cooperation at three levels: “A better solution for less money”). (only available in Icelandic)
- Icelandic Parliament (2011) *Efling Græns Hagkerfis á Íslandi* (Promoting Green Growth in Iceland). (only available in Icelandic)
- Innovasjon Norge (2009): *We give local ideas global opportunities*. Strategy 2009-2013.

- Jones, Randall S. and Byungseo Yoo (2010): *Korea's green growth strategy: mitigating climate change and developing new growth engines*. OECD, Economics Department Working Papers no. 798. ECO/WKP(2010)54
- Korean Ministry of Education, Science, and Technology (2010): *Science and Technology Basic Plan of the Lee Myung Bak Administration – Becoming an S&T Power Nation through the 577 Initiative (2008-2012)*.
- Local Government Denmark (2011): *Et sundhedsvæsen i verdensklasse? - Ikke uden kommunerne*. (A world Class Health Care System? Not without the local governments) Report
- Lundvall, Bengt-Åke (2008): *A note on characteristics of and recent trends in National Innovation – Policy Strategies in Denmark, Finland and Sweden*. Kunnskapsdugnaden 2008.
- Monday Morning Denmark (2010): *Sådan Lukkes Klimagabet* (How to close the climate gap). No. 27, 15 August 2010
- Monday Morning Denmark (2011): *Innovation får topprioritet hos ny regering* (Government gives innovation first priority). MM 34.
- Neste Oil (2011): *Excellent results from biofuel trial involving Neste Oil, Helsinki Region Transport, and Proventia: significantly reduced local emissions*. Press Release 10 February 2011 <http://www.nesteoil.com>
- Norwegian Ministry of Health and Care Services (2011): *Innovasjon i omsorg*. (Innovation in Care). Commission on Innovation and Care (Utvalg om "Innovasjon og omsorg"), NOU 2011: 11
- Norwegian Ministry of Trade and Industry (2008): *An Innovative and Sustainable Norway*. Short version of the White Paper, Report No. 7 to the Storting (2008–2009).
- Norwegian University of Science and Technology, Carbon Footprint of Nations: <http://www.carbonfootprintofnations.com/>
- OECD (2009): *OECD Reviews of Innovation Policy – Korea (2009)*. OECD Publishing
- OECD (2010): *The OECD Innovation Strategy – Getting a Head Start on Tomorrow*. May 2010
- OECD (2011): *Society at a Glance 2011 - OECD Social Indicators*. www.oecd.org/els/social/indicators/SAG
- Olofsson, Maud, Närings- och energiminister (2011): *Offentliga upphandlingar stöttar innovationer* (Public procurement promotes innovation). Feature article, Dagens Samhälle 15 september 2011.
- PriceWaterhouseCoopers, Significant and Ecofys (2009): *Collection of statistical information on Green Public Procurement in the EU*. Report on data collection results. January 2009
- Prime Minister's Office (2011): *Iceland 2020 – governmental policy statement for the economy and community – Knowledge, sustainability, welfare*.
- Research and Innovation Council of Finland (2008): *Expanding Innovation Activities: New Interactions between Players and Functions – Policy Report 2008*.

- Research Council of Norway (2011): *Forskningsrådets arbeid for innovasjon 2011 – 2014*. (Work plan for the Research Council on innovation).
- Rosted, Jørgen and Anne Dorthe Jossiasen (2010): *Intelligent offentlig efterspørgsel og innovative offentlige udbud* (Intelligent public demand and innovative public tendering).
- Science and Technology Policy Council (2010): *Building on Solid Foundations - Science and Technology Policy for Iceland 2010 – 2012*
- Sørensen, Eva and Jacob Torfing (Eds.): *Samarbejdsdrevet innovation - i den offentlige sektor* (Cooperation-driven innovation in the public sector). DJØF Forlag
- Statens Offentliga Utredningar: *Innovationsupphandling – Betänkande av Innovationsupphandlingsutredningen* (Innovative procurement – report by the commission on innovative procurement). SOU 2010:56
- Tällberg Foundaiton (2010) *Tällberg Global Index Compilation*
- Technical University of Denmark (2010): *Innovation i nyere bæredygtigt byggeri*. (Innovation in sustainable construction).
- Tekes (2011): *Tekes strategy. Growth and wellbeing from renewal*
- US Department of Labor (2011): *Charting International Labor Comparisons 2011*. BLS, August 2011
- Vækstforum (Growth Forum) (2011): *Ny vækst i Danmark – Hovedkonklusioner fra Vækstforum*
- VINNOVA (2009): *Strategiförslag för FoU och innovation för hållbar tillväxt* (Draft strategy on R&D and innovation for sustainable growth). VINNOVA Dnr 2009-00377.
- VINNOVA (2011): *Challenge-driven Innovation – VINNOVA's New Strategy for Strengthening Swedish Innovation Capacity*. VINNOVA Information VI 2011:07
- World Commission on Environment and Development (1987): *Report of the World Commission on Environment and Development: Our Common Future*

Sources Best practices

Omsorg+

- Monday Morning Norway: *Kommunene må tenke sjæl*. No. 22, 27. June 2011
- Ernst and Young: *The state of remote care in Norway – enabling a sustainable welfare state*. November 2011.
- Nasjonalt program for leverandørutvikling: <http://www.leverandorutvikling.no/>

Learning About Innovation Procurement

- Tillväxtverket: *Projekt: Lärande om innovativ upphandling*.
<http://www.tillvaxtverket.se>

Finnish Environment Institute

- Finland's Environmental Administration: www.environment.fi/eco-officebuilding
- Ari Nissinen, Senior Researcher, Finnish Environment Institute (SYKE)

Karolinska Hospital

- Stockholm County Council. *We are Building a World Class University Hospital*. Report 2011. <http://www.nyakarolinskasolna.se/>
- Rosted, Jørgen and Anne Dorthe Josiassen: *Intelligent offentlig efterspørgsel og innovative offentlige udbud*. Report for FORA, November 2010

The Finnish Wellbeing Center

- FinNode: www.finnnode.fi
- Finnish Wellbeing Center: www.fwbc.fi
- Invest Japan (2003): *Sendai Aims to Become a Welfare Leader* by Teaming Up with Finland. No. 1, P. 11-13.
- Good News from Finland (2010): *FWBC exports Finnish healthcare and wellness expertise to Japan*. Wed, 24 March, 2010. <http://www.goodnewsfinland.com>
- Finpro (2010): *Grand Opening Ceremony of the First Thai-Finnish Wellness Centre in Bangkok – Further expansion to begin in autumn 2010*. Press release, 16 August 2010
- Masahiro Kimura, Senior Commercial Officer, Finpro

Navigator Prosjektet

- Monday Morning Norway: *Verdens største helsemarked jakter på ny kunnskap*. No. 32, 17 October 2011
- Innovation Norway: www.innovasjon Norge.no

Cargotec

- The Finnish Environmental Cluster for China: <http://fecc.fi/>

Ideas Clinic

- Monday Morning (2011). Sygehusets Ideklinik
- KASK Innovation: <http://kask-innovation.eu/>
- Monday Morning (2010). Norden kan blive en førende global sundhedsregion

Living Labs

- Halmstad Living Lab: <http://www.halmstadlivinglab.se>
- Helsinki Living Lab: <http://www.helsinkilivinglab.fi>
- Open Living Labs: <http://www.openlivinglabs.eu/>

Welfare Tech Region

- Monday Morning Denmark: *Velfærdsteknologi i rugekassen*. No. 18, 9 May 2010
- Monday Morning Denmark: *Norden kan blive en førende global sundhedsregion*. No. 37, 24 October 2010
- Welfare Tech Region: <http://www.welfaretechregion.dk>

The Finnish Cleantech Cluster

- The Finnish Cleantech Cluster: <http://www.cleantechcluster.fi>
- International Clean Tech Group: Top 10 Cleantech Cluster Organizations in 2010

‘iBikeCph’

- City of Copenhagen: *Fra god til verdens bedste – Københavns cykelstrategi 2011-2025*. Draft, October 2011
- City of Copenhagen: *City of Cyclists – Bicycle Account 2010*. www.kk.dk/cityofcyclists
- COWI: *Københavns Kommune: Samfundsøkonomisk analyse af cykeltiltag – metode og cases*. Report January 2009
- Road Directorate: *Collection of Cycle Concepts*. Report 2000
- Monday Morning Denmark: *Copenhagen – Beyond Green. The Socioeconomic benefits of being a Green City*. Report, 2011
- Cycling Embassy of Denmark: www.cycling-embassy.dk

Telemedicine

- Ericsson Research study: *Telemedicine helps cut carbon emissions*. April-June 2009. <http://www.ericsson.com>
- Laukli, Randi: *Når videokonferanse kan redde liv!*. Article from Norwegian Centre for Integrated Care and Telemedicine, 18 August 2011, <http://www.telemed.no/>
- Jemec et al: *Telemedicin – gnist til nytænkning*. Article in Børsen, 11 August 2011
- Monday Morning Denmark: *Kommuner og kronikere – bedre pleje og behandling i eget hjem*. Forthcoming 2011
- KITEMPI: KOLARCTIC IT Education, Networking, Partnership and Innovation. <http://telemed.no/kitempi>

New Nordic Food

- Monday Morning Denmark: *Gastronomisk vinderopskrift kan skabe nyt dansk superbrand*. No. 10, 14 March 2011.
- New Nordic Food: <http://nynordiskmad.org>
- The Reykjavik Grapevine: *Skyr’s New Partner in Crime.*, 14 March 2011
- OPUS – Food of life: www.foodoflife.dk

Vatnavinir

- Global Award for Sustainable Architecture 2011, Locus. <http://locus-foundation.org>
- Vatnavinir’s webpage: <http://www.vatnavinir.is>
- Monocle: *25 Retail Stars*. Issue 32, vol. 04. April 2010

The Business Innovation Fund

- The Business Innovation Fund: www.fornyelsesfonden.dk
- Danish Enterprise and Construction Agency (2011): *Faktaark – Program for Brugerdreven Innovation*

Interviewees

Denmark

- Birthe Dinesen, ass. professor, The Department of Health Science and Technology, Aalborg University.
- Dorte Dalgaard, project manager, The Region of Southern Denmark.
- Dorte Stigaard, CEO, regional development and innovation in The North Denmark Region.
- Jørn Jespersen, CEO Dansk Miljøteknik
- Maja Lænkholm, project manager ATV
- Thomas Børner, managing director of the Foundation for Welfare Technology.

Finland

- Heidi Anttila, senior researcher, PhD, PT, National Institute for Health and Welfare (THL)
- Jaro Romanainen, Executive Policy Adviser at Tekes - the Finnish Funding Agency for Technology and Innovation
- Mikko Martikainen, Ministerial Adviser at Ministry of Employment and the Economy
- Pekka Ylä-Anttila, manager at ETLA, the Research Institute of the Finnish Economy
- Teija Palko, Senior Adviser, Ministry of Employment and the Economy

Iceland

- Hallgrímur Jónasson, General Director, RANNÍS – The Icelandic Centre for Research
- Kristín Gunnarsdóttir, Project Manager, Iceland Design Centre

Norway

- Paul Chaffey, CEO in Abelia, Business Association of Norwegian knowledge- and technology based enterprises, associated NHO, Norway's largest employers' organization
- Richard Wootton, PhD, Professor, Research director, Tromsø Telemedicine Laboratory
- Rune Fensli, Research manager, University of Agder

Sweden

- Björn Sandén, Professor in Environmental Systems Analysis at Chalmers
- Cecilia Sjöberg, Chief Strategy Officer, Services, VINNOVA

- Helena Tillborg, Business advisor, Cleantech and Sustainability, Teknopol
- Axel Nekham, project manager, Tillväxtväcket

Nordic

- Erland Vinterberg, project manager within assistive technology at Nordic Centre for Welfare and Social Issues
- Sigridur Thormodsdottir, Senior Innovation Adviser, Nordic Innovation

The European Union

- Máire Geoghegan-Quinn, EU Commissioner for Research, Innovation & Science

Members of the steering-committee

Berglind Hallgrímsdóttir, Christian Bruhn Rieper, Jonas Brändström, Paula Nybergh, Vincent Wego Fleischer

Towards a new innovation policy for green growth and welfare in the Nordic Region

This is a report on how the Nordic countries via innovation can reinvent the Nordic model – making it a more sustainable role model for addressing global challenges. More sustainable because it is based on sustainability in three dimensions: environmental, social and economic – and the links between the three.

Innovation in green growth and welfare is already taking place in the Nordic region. But this report goes one step further and looks at how innovation policy can foster and promote synergies between green growth and welfare. In other words, it is about finding methods and policies that connect the three dimensions of sustainable development.

A reinvention of the Nordic welfare model would not only be the role model for welfare *states*, but for welfare *societies*. Societies having a more open approach to innovation that involves users, focuses on demand and secures sustainable public procurement, where the public sector catalyzes partnerships with companies, citizens and organizations, and adds societal and environmental dimensions to innovation. In short: new Nordic innovation.

Nordic Innovation is an institution under Nordic Council of Ministers that facilitates sustainable growth in the Nordic region. Our mission is to orchestrate increased value creation through international cooperation.

We stimulate innovation, remove barriers and build relations through Nordic cooperation
