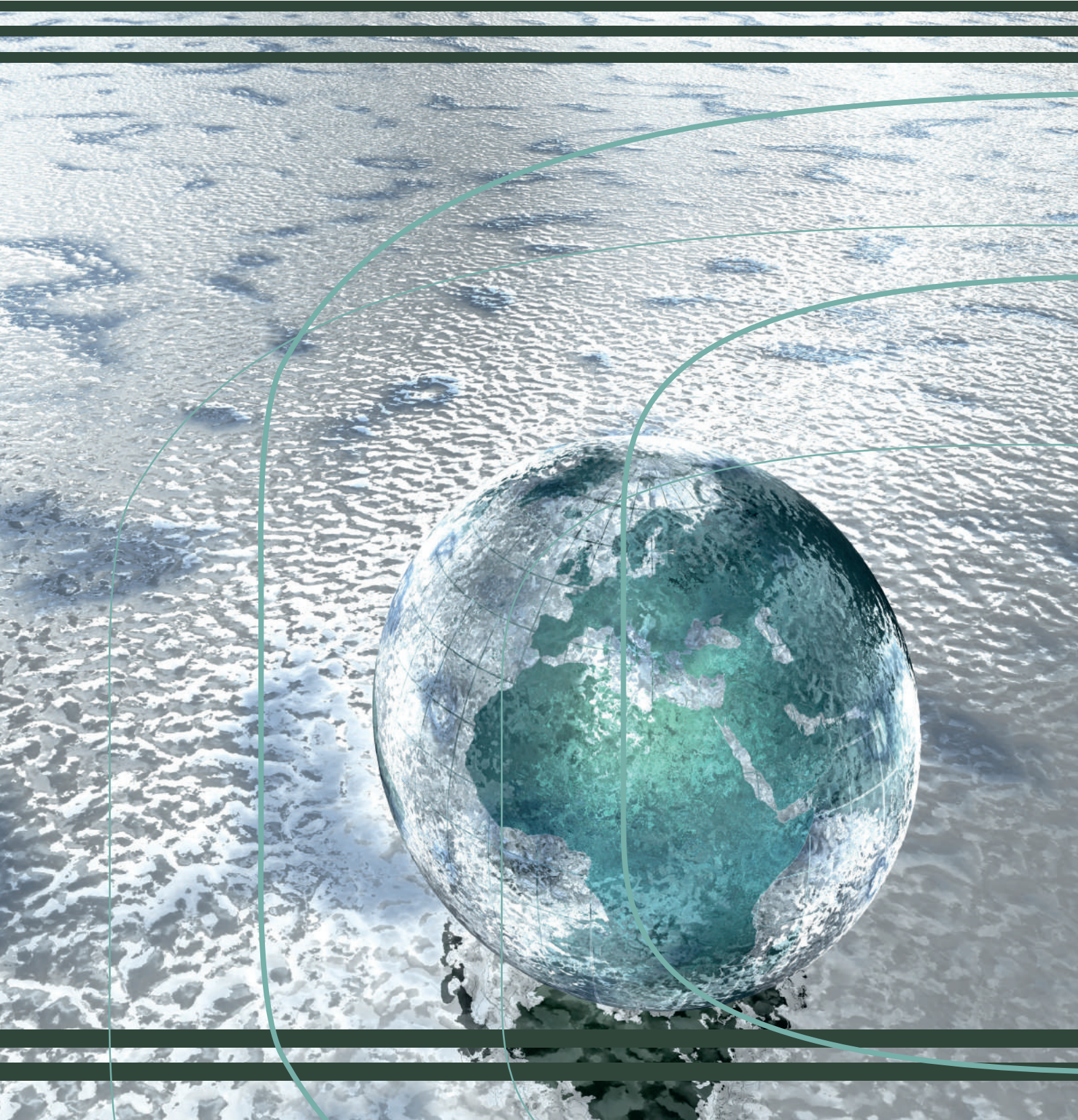


Nordic best practices

Relevant for UNEP 10YFP of sustainable consumption and production





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Anna Hillgrén, Marika Bröckl and Mikko Halonen

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Preface

The working group on Sustainable Consumption and Production (HKP gruppen), under the Nordic Council of Ministers, launched this project for identifying, writing out and publishing best practice cases of sustainable consumption and production on the UNEP SCP Clearinghouse. The project was awarded to the tender from Gaia Consulting Oy.

The project identifies and showcases eight Nordic best practice examples of sustainable public procurement and eleven Nordic best practice examples of sustainable lifestyles and education. The cases are presented in this final report. They have also been published at the UNEP SCP Clearing House at <http://www.scpclearinghouse.org/scp-initiatives.html> to allow for wide international distribution and sharing of lessons learned.

The Gaia project team included Anna Hillgren (project manager), Marika Brockl (senior consultant) and Mikko Halonen (project director). The work was supervised by a steering group consisting of the following Nordic focal points to the UNEP 10 Year Framework Program (10YFP): -Helene Hoggen, the Norwegian Ministry of Climate and Environment -Eva Ahlner, the Swedish Environmental Protection Agency - Taina Nikula, the Finnish Ministry of the Environment -Birgitte Jørgensen Kjær, the Danish Environmental Protection Agency.

The HKP group hereby wants to express its gratitude to Anna, Marika and Mikko at Gaia Consulting as well as to the steering group for their contribution to the project and hopes the results will be of inspiration for many others.

Helsinki 18th February 2016, on behalf of the NCM SCP working group (HKP gruppen)



Ari Nissinen

Chair of the SCP/HKP group,
Head of Unit Environmental Efficiency,
Finnish Environment Institute

Summary

The Nordic countries actively work in national and international fora to prevent resource scarcity and unsustainable exploitation of natural resources. This report showcases Nordic experiences in promoting sustainable consumption and production (SCP). The goal is to share Nordic Best Practices and lessons learned with other stakeholders and partners.

This report presents nineteen initiatives that cover two particular themes: 1) Sustainable Lifestyles and Education and 2) Sustainable Public Procurement. The cases were identified together with the Nordic Council of Ministers working group on SCP. The chosen initiatives were selected from a wide variety of Nordic cases. The target was that the cases facilitate the spreading of knowledge on effective, successful and sustainable means of advancing SCP. The cases are presented in a manner designed to facilitate a comparison of strengths, key results, novelty and lessons learned of each particular case. They have been compiled and presented in a comparative and comprehensive manner in order to facilitate uptake and replication of best practices. The case descriptions are based on material made available to the consultant, including documents shared by the case representatives as well as information gathered through structured case interviews. Validation of the completeness and/or accuracy of data provided has not been part of the assignment.

The eleven cases in the theme Sustainable Lifestyles and Education consist of different projects and programs designed to guide people towards a more sustainable lifestyle. The case target groups range from pre-school and schoolchildren, office workers and start-up companies to citizens of a city or the entire nation.

The Sustainable Public Procurement theme consists of eight cases, where the focus is on the public procurer in different organisations and at different levels, including a city, a region or a country. The cases include a local model of circular economy, systematic procurement based on an environmental strategy, and a nationwide network of knowledge sharing. Cases where demand of more sustainable solutions has affected markets are also included, such as demand for sustainable energy, public transport and cleaning services.

In line with the overall objectives of this Nordic project on best practices, the cases have also been added into the UNEP's 10 Year Framework Program (10YFP) information platform, the SCP Clearinghouse.¹ UNEP's 10 Year Framework Program for Sustainable Consumption and Production is a concrete result of Rio+20. The objective is to enhance international cooperation in order to accelerate a shift towards sustainable consumption and production in developed and developing countries. The SCP Clearinghouse is a web-based information sharing tool, which can be used by different actors as an inspiration for advancing SCP worldwide. The SCP Clearinghouse also provides additional information and links for further information on the cases presented in this report.

¹ <http://www.scpclearinghouse.org/>

Sustainable Lifestyles and Education

1. Denmark

1.1 Bike to School campaign – National biking promotion campaign in Denmark



Case Description *

- *Country:* Denmark (Region: Europe).
- *Geographic scope:* National.
- *Theme:* Sustainable Lifestyles and Consumption.
- *Type of Initiative:* Partnerships and voluntary agreements. Information, awareness-raising, education.
- *Lead actor:* The Danish Cycling Federation.
- *Type of lead organization:* NGO/Civil society.

Budget

The budget of the Bike to School campaign has been about 1.4 MEUR in total in the years 2009–2012 (1.3 MEUR in 2013 value) and the yearly budget is EUR 335,000. The campaign is free for the participating schools. Financing is provided mainly by private foundations.

Partners

The Trygg Foundation is the main partner that finances the campaign and some municipalities contribute with funds and prizes.

Status

The campaign has been repeated annually since 2009.

Next steps

Some plans exist to expand the campaign to include the possibility to bike to after-school activities for those children, who live too far away from their schools to bike to school.

Contact person for more information

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

1.1.1 Introduction

Denmark has been a forerunner in promoting biking as a form of everyday transport by providing good cycling infrastructure. Biking promotion campaigns by the Danish Cycling Federation have successfully promoted everyday biking to school and to work.

The Bike to School campaign is an annual campaign, which promotes cycling to school. The goal is to get more children to bike to school routinely and to learn good and secure way of biking and especially using a helmet. The campaign started in 2002 and it has so far been very successful and has produced good socio-economic benefits. Annually about 120,000 to 150,000 children participate in the campaign. The campaign is managed by the Danish Cycling Federation.

The Danish Cycling Federation also runs the Bike to Work campaign, which is very similar to the Bike to School campaign. It targets adults and work teams and has also been very successful. The Bike to Work campaign started in 1998.

1.1.2 Objectives

The purpose of the Bike to School campaign is to increase the number of children who bike to school and to raise awareness of safety rules and especially helmet use. The objective is also to make physical activity and learning go hand in hand, as studies have shown that physical activity has a beneficial effect on children's ability to learn and concentrate.

1.1.3 Activities

The Bike to School campaign is the children's counterpart to the Bike to Work campaign, which targets adults. The Bike to School campaign targets students between the ages 5 and 15. The campaign is organized yearly and involves the teachers enrolling a class in the campaign. The campaign runs for two weeks in September every year, with classes all over the country competing to see who can cycle to school the most.

Each day, the class notes the number of students arriving on bicycle and how many of them were wearing a helmet. Participation and helmet use triggers a ticket in a nationwide lottery with various prizes for the entire class. The prizes are provided by sponsors.

The campaign includes a comprehensive campaign website, which caters to students, teachers, and parents. Teachers can find inspiration on how to incorporate the bicycle in class activities and teaching, and students can amuse themselves with fun bicycle-related activities and games. The campaign is backed by e-mail and newsletter communication, where ideas regarding teaching and activities are highlighted and suggested to teachers.

Materials, which incorporate cycling into teaching and school activities, are provided to teachers. "Cycling Games" is a concept of fun games using a bicycle that teaches safety and integrates learning and biking. The "Cycling Games" brochure has been translated into English, Portuguese and Spanish.

Many municipalities back the campaign both in terms of economic support, local prizes, and by encouraging the schools to participate. For many schools, the campaign has become a tradition to which especially students in middle school are very dedicated.

There are special rules for the younger students who are too young to cycle to school on their own. Instead, you get points for cycle training with your parents after school hours. In this way, the campaign also promotes cycling by other family members.

1.1.4 Success factors

The aim is to stabilize numbers of children that bike to school to the current level, as there is pressure for reduced biking. Success indicators are the number of school classes and children that participate and complete the campaign. A critical success factor of the campaign is getting parents to commit to the campaign and teachers to also bike to school.

1.1.5 Key Results and Achievements

Sustainability impacts

In the years 2009–2012, over 565,000 children have participated in the campaign and 350,000 of them have actually biked to school. Teachers have estimated that cycling by children who have participated in the campaign has increased by 30% after the campaign has finished. This corresponds to 2,638,399 km cycled in the period 2009–2012.

The campaign has made school children bike more and thus has produced health benefits. This in turn may result in fewer sick days for the children and thereby less sickness related absences for their parents. As children bike to school they motivate their parents to bike more instead of driving their car. This leads to less congestion, pollution, and less need for road maintenance.

Cost-effectiveness

The cost-effect of the Bike to School campaign has been positive. An evaluation made by COWI in 2013 indicated that the results are quantifiably in economic terms. During the two-week campaign in 2012, the socio-economic benefits amounted to a return of 14% on the total yearly investments in the campaign. When evaluated on longer term, the campaign has resulted in an internal return of 50% to 100%, which among other things considers benefits from reduced driving as well as health benefits to children and their parents etc.

Challenges and potential for further development

Support for the campaign from the Danish elementary schools is strong. One challenge is getting even more parents to commit to the campaign and to get more teachers to bike to school. Their engagement and example has high impact on committing schoolchildren to bike to school.

Another challenge is that as schools in Denmark merge, the distances children have to bike to school increases and fewer children have the realistic possibility cycle to school. Plans exist to allow biking to afterschool activities to count in the campaign, making it possible for more children to participate and feel motivated to join in the campaign.

1.2 Climate Embassy by Concito

Case Description *

- *Country:* Denmark (Region: Europe).
- *Geographic scope:* National.
- *Theme:* Sustainable Lifestyles and Consumption.
- *Type of Initiative:* Partnerships and voluntary agreements. Information, awareness-raising, education.
- *Lead actor:* CONCITO, Denmark's Green Think Tank.
- *Type of lead organization:* NGO/Civil society.

Budget

The Climate Embassy is financed by private means, mainly by company foundations. The budget varies from year to year and depends on the ongoing projects.

Partners

CONCITO, Nordea Foundation and other foundations. Some municipalities that work with school projects e.g. Copenhagen.

Status

Ongoing.

Next steps

The goal is to deepen the Partnerships and develop the program further.

Contact person for more information

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

1.2.1 Introduction

The Climate Embassy is a Danish interdisciplinary network of about 100 active young climate interested volunteers aged between 19 and 28, the climate ambassadors, who teach students and other stakeholders about climate issues and sustainability. The Climate Embassy concept is based on network communication and devoted, knowledgeable, young students acting as role models and dynamic communicators for children and young people. The Climate Embassy concept was launched in 2009.

After taking part in a free education workshop focusing on climate, communication and networking, the climate ambassadors can participate as communicators, youth mentors and facilitators in different teaching related projects of the Climate Embassy. The focus is on climate and sustainability. The method is solution oriented and based on activating young to young communication using relevant and new scientific knowledge, concrete examples, films and student interaction. The lessons and services are free for the schools.

1.2.2 Objectives

The objective is to generate interest and strengthen primary school children's and high school students' green competencies through activating and inspiring educational content as well as through fact-based projects, using peer to peer communication.

1.2.3 Activities

The Climate Embassy offers a free educational concept to schools, with focus on current themes around climate and sustainability. The target group is grade 7 to 10 in primary education, after school activities, high schools and vocational schools. The content is adapted to the target group, the themes they are interested in and to the number of students. The educators are young people participating in the Climate Embassy program who work as volunteer youth ambassadors.

Activities and available support:

- Activating youth to youth communication and lessons.
- Workshops on climate and resources for 7th graders, where the relationship between nature, resources and technology are explored.
- One week climate practice for 8th or 9th graders, with focus on climate, green innovation and sustainable development. It includes company visits and visits to other relevant institutions as well as development of a personal project.
- Assistance and sparring as needed for e.g. class projects and different types of sustainable school initiatives including Green Flag initiatives.

Lessons held at schools by the youth ambassadors focus on:

- Sustainable consumption: environmental consequences of global consumption and its climate effects with examples of sustainable and climate smart solutions.
- Reusing, recycling and reducing: with focus on resources and resource use.
- Sustainable energy.
- Future of transportation: with focus on some of the problems associated with transports and what can be done to make transportation more environmentally sustainable.

1.2.4 Success factors

An essential success factor is motivating the youth ambassadors as the concept is based on volunteer work.

1.2.5 Key Results and Achievements

Novelty

When the initiative was originally launched in 2009, this was quite unique, but now there may be other similar concepts.

Sustainability impacts

Formal evaluations have been made of some long-term projects conducted at schools, but not of short-term school projects or lessons, which are also part of the concept. Feedback received from teachers has indicated that youth to youth communication works very well. Teachers have reported that young people can identify with the climate ambassadors and that the students are perceived as role models. Pupils are especially impressed by the fact that the volunteers are not paid and that they seem to be very highly motivated. The pupils really connect with the volunteers, especially in the longer projects.

The feedback received from the high schools has been very positive. There the climate embassy workshops and lessons have been reported to facilitate more creative ways of working.

Additional reported benefits relate to the fact that the climate ambassadors, mostly students themselves, get to use their knowledge in new ways and gain valuable teaching experience. Many have continued to work in fields related to sustainable development.

Cost-effectiveness

The concept is volunteer based, but receives some funding from participating municipalities and some foundations.

Challenges and potential for further development

Volunteer based activity can be challenging, as the time the volunteers can commit to is not always certain. Meeting the needs of the schools and other stakeholders and getting the necessary funding, while working with a small staff, can also be a challenge. The concept could be easily adapted to other countries.

2. Finland

2.1 The Peloton Club – a peer-incubator for resource smart startups



Case Description *

- *Country:* Finland (Region: All).
- *Geographic scope:* International.
- *Theme:* Sustainable Lifestyles and Consumption. Sustainable urban development and cities.
- *Type of Initiative:* Policy frameworks and processes. Capacity-building and technology transfer. Partnerships and voluntary agreements. Information, awareness-raising, education.
- *Lead actor:* Demos Helsinki Oy.
- *Type of lead organization:* Business sector.

Budget

The budget is approximately EUR 100,000–150,000 per year.

Partners

Partners include the Finnish Innovation Fund (Sitra), Ministry of Employment and the Economy, Ministry of Agriculture and Forestry, the Central Union of Agricultural Producers and Forest Owners (MTK), Nordic Innovation, Ministry of the Environment, Climate KIC as well as various Finnish companies and public foundations.

Status

Ongoing.

Next steps

Peloton Club's international expansion and strengthened presence in Finland.

Contact person for more information

Maria Ritola, maria.ritola@demos.fi

* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

2.1.1 Introduction

Peloton Club is one of the largest acceleration programmes for new, user-powered solutions to housing, transportation and food in the Nordic countries. At its heart is the peer-incubator that brings together start-ups, large companies and the public sector.

The Peloton approach supports different industries and organisations in developing products, services and social innovations. The target is to contribute towards making resource-smart and climate-friendly choices easy and attractive as well as to generate new profitable business opportunities. The concept includes several different methods and activities such as the Peloton workshop, Peloton Innovation Camp and the Peloton Club, which is a peer-incubator for resource-smart startups.

Peloton was launched in 2009 and it has evolved from a single project into a way of thinking and a startup accelerator. The concept is managed by Demos Helsinki Oy and is financed by several different public and private partners.

2.1.2 Objectives

Peloton Club provides consumers with new products and services that promote a more sustainable way of life. It does this by fostering new businesses in cleantech and sustainable solutions, and by helping existing markets prepare for low-carbon innovations. Given that 80% of the average consumer's energy use is spent on housing, food and transportation, the bulk of Peloton's work is also concentrated on those three key sectors.

2.1.3 Activities

The Peloton concept includes the following elements and activities:

- Peloton workshops, where organisations from different industries develop environmentally friendly products and services into easy and desirable choices, while creating new business opportunities.
- Peloton Innovation Camps, which help kick-start entirely new energy- and resource-smart businesses.
- The Peloton Club, a peer-incubator in which start-ups and innovators spur each other on to create business ideas that change the world.
- Peloton Business of Behaviour Change research project, which is part of a broader SHAPE Shaping Markets for Sustainability initiative, is a project that investigates ways to make markets more sustainable through co-created services. The target is to create opportunities for companies to develop their services together with various different user product groups. At the same time, the changes in value chains forged by such joint work are modelled.

2.1.4 Success factors

A participatory, iterative process has been important for the overall success of the concept. Active measures have been taken to keep the threshold of participation as low as possible, encouraging all relevant, potential partners to take part. Experienced moderators have been brought in to guide the processes, nurturing the networking and overall motivation of the teams, and facilitating the participation of various stakeholders in workshops and other events.

2.1.5 Key Results and Achievements

Recent successes include organizing the Finnish leg of the world's largest climate innovation competition, Climate Launchpad, as well as Smart Retro, an innovative new corporate venturing scheme for the built environment. Peloton Club also hosts monthly socials and puts on larger events, like Flow Talks, that help bring its core ideas of co-creation and quality discussions to the larger public.

Novelty

The concept represents an entirely new model for business incubators. It is unique in its way of including different stakeholders and engaging them in start-up operations. The innovation within startups is seen by Peloton as a driver for new market development, therefore benefitting the entire industry.

Sustainability impacts

Peloton Club was established in 2006. Since then, it has run fifteen innovation workshops with hundreds of gatekeepers countless different industries. During the workshops, the companies have co-created dozens of new sustainable innovation concepts. Some of these have led to extremely successful new businesses.

Challenges and potential for further development

Formalising the process and ensuring the programme's overall continuity remain top priorities. The predictability of funding is also a challenge. In terms of impact, a common test for these kinds of initiatives is how successful they can upscale new and promising products and services.

2.2 WWF Green Office Program



Case Description *

- *Country:* Finland (Region: All).
- *Geographic scope:* International.
- *Theme:* Sustainable Lifestyles and Consumption. Sustainable Public Procurement. Buildings and construction. Media, advertising and marketing. Water.
- *Type of Initiative:* Analysis and assessment. Partnerships and voluntary agreements. Information, awareness-raising, education.
- *Lead actor:* WWF Finland.
- *Type of lead organization:* NGO/Civil society.

Status

Ongoing.

Next steps

Expanding the program to more countries as well as continuing to expand in Finland.

Contact person for more information

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

2.2.1 Introduction

WWF's Green Office is a practical environmental management system (EMS) for offices, which was launched in 2002. The EMS consists of several parts. These are: 1) a meaningful way to reduce expenses, 2) a tool to support environmental management work, 3) an education program that inspires employees to adopt environmentally friendly habits, and 4) a tool for internal and external environmental communication. With its help, workplaces are able to reduce their burden on the environment, achieve savings and reduce their impact on climate change.

The aim of the program is to reduce carbon dioxide emissions and offices' ecological footprint. Green Office is suited to offices – both large and small – in private companies, the public sector and other organisations. The target group includes office facilities that wish to improve their environmental management. The global program is managed by WWF Finland.

2.2.2 Objectives

The purpose of Green Office is to:

- Reduce the consumption of natural resources in offices.
- Climate change mitigation.
- Facilitate activities that promote sustainable lifestyles.

The basic principle of the Green Office program is to promote continuous improvements towards reducing the environmental impacts of office work. Green Office aims for concrete results to improve the environmental performance of the participating organisations.

2.2.3 Activities

WWF Green Office program offers offices a practical environmental management and certification system, with a special focus on CO₂ emissions. The structure of the program is similar to formal environmental systems or quality systems, but is specifically aimed at offices and thus primarily targets behaviour change. The system costs are relative low and it is much easier to implement than e.g. formal ISO based environmental management systems. The system requires yearly reporting to a database and an audit by WWF every three years. The management system offers 1) a meaningful way to reduce expenses, 2) a tool to support environmental management work, 3) an education program that inspires employees to adopt environmentally friendly habits, and 4) a tool for internal and external environmental communication. With its help, workplaces are able to reduce their burden on the environment, achieve savings and reduce their impact on climate change. The Green Offices can use the WWF Green Office logotype in their communication.

Green Office gathers leading sustainable organisations in an international network where experiences and best practices are shared. The concept includes the following tools and elements:

- *Green Office Best Practices Database*: The WWF Best Green Office Practices webpage presents good example cases from the network around the world.
- *Consumer Habit Questionnaire*: The employees fill in an online Consumer Habit Questionnaire on a yearly basis, which evaluates the sustainable habits at the office.

- *Training and network meetings:* WWF Finland organises trainings or network meetings for Green Offices around the world. The topics of these network meetings vary from green energy, food, and electronic waste recycling to improving working environment and efficient office space usage.
- *Climate Calculator – calculating tool, database and reporting method:* The Climate Calculator is a web application designed to help offices, properties and individuals measure greenhouse gas emissions and find ways of reducing them.
- *Compass extranet service for members:* The Compass extranet includes guidelines, supporting materials, assessment forms, models for environmental program, latest news and updates, as well as contact information. The Compass also acts as a database and reporting tool.

2.2.4 Success factors

A success indicator is the continuous improvement in energy consumption, waste reduction, paper consumption and the related CO₂ emissions. Another key indicator is the development of the improvement in the employee survey results.

2.2.5 Key Results and Achievements

Novelty

Other more general environmental management systems exist, but this is a system specifically geared towards offices. The system is easily implemented in the office, and does not require dedicated full-time resources to roll out or administrate. It is comprehensive and includes several tools and elements, which are useful for the participants. No other environmental system includes all the elements included in Green Office.

Sustainability impacts

In Finland the Green Office network saved over 8.9 million kilowatt-hours of electricity, and over 21 million sheets of paper in 2013. Emissions caused by waste generated in the Finnish Green Offices decreased 149 tCO₂. The average scores in the consumer questionnaire have increased, indicating an improvement in environmental thinking and habits at the office. The program appears to have been very successful in promoting social learning: participating offices exchange experiences via regular

network meetings, and environmental and energy management is institutionalised in the participating offices.

The income generated to WWF by Green Office membership payments is used for environmental protection programs.

Cost-effectiveness

The cost is relatively low for the participating companies and includes all the tools and concepts as well as the use of the WWF Green Office logo. The program in itself is cost efficient as it is easily scalable to different countries, as the same tools can be used in different language versions. The program has been launched internationally in 12 countries (2013) and over 600 offices and almost 300 companies participate.

Challenges and potential for further development

The process of scaling up is ongoing. The concept is easily scalable to different countries, as experiences have shown that office work is very similar in different countries and people often possess similar skills. The principal differences relate to potentially different management cultures and existing knowledge of management systems. Experiences have shown that in some countries more control may be useful (audit every year instead of every three years) than in others because of higher employee turnover or a different management culture.

3. Faeroe Islands

3.1 Free public transportation in Tórshavn Municipality in the Faroe Islands

Case Description *

- *Country:* Faroe Islands (Region: Europe).
- *Geographic scope:* Local.
- *Theme:* Sustainable Lifestyles and Consumption. Sustainable urban development and cities. Transports and Mobility.
- *Type of Initiative:* Economic and financial instruments.
- *Lead actor:* Tórshavn Municipality.
- *Type of lead organization:* Government.

Budget

The City Council fully funds this project through the City Council's annual budget. The yearly budget is EUR 3.35 million, which is paid by the 20,000 inhabitants of the city through taxes.

Partners

Private bus operator.

Status

Ongoing.

Contact person for more information

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

3.1.1 Introduction

The city of Tórshavn, the capital of The Faroe Islands, is promoting a shift from private car use to public transport through economic incentives, i.e. by making public bus transport free for everyone.

Traditionally the only means of public transport on the Faroe Islands has been buses or ferries. The bus service in Torshavn was rarely used due to an infrequent service – a service that people were unwilling to pay for. People preferred to use their cars, which made for a heavily congested town center and a premium on parking spaces. The free public transportation has led to more people using buses instead of private cars and has led to the development of more frequent and better planned bus services. The free public transportation was piloted in 2009 and has continued and been further developed since then.

3.1.2 Objectives

The project aims at reducing air pollution, fuel usage, noise and the emission of greenhouse gases as well as road maintenance needs and costs, and parking congestion in the city. The goal is also to enhance traffic safety, both by minimising the number of private cars in the city and by making the bus-drivers' work less stressful. The over-arching goal is to create an environment in which the children of the municipality consider it perfectly natural to take the bus, rather than being driven to and from school, sports practice, or other free time activities by their parents or friends. The target group is all citizens but especially children.

3.1.3 Activities

In 2008 the municipality of Tórshavn established free public bus transports for all. In 2010 the frequency of trips during daytime was increased to every 20 minutes. The following year, old buses were replaced with new, smaller models. In total 14 new busses of the type SOR were acquired. The busses can have 29 people sitting and 37 people standing in the bus as well as 2 baby carriage or 1 baby carriage and 1 wheelchair. There is in total space for 66 people in the busses. The busses are shorter than the old ones, which makes them better for city driving. The location of the buses is tracked using GPS, allowing passengers to view the real time location of their bus online, or via an SMS request.

The investment and the operation of the city bus system has been outsourced to private operators for a period of seven years, with an option for the City Council to extend the contract period for another two years. The City Council pays a fixed price per hour of effective operation of the buses. This price is based on the operator's investment and operating costs.

3.1.4 Success factors

Some key success factors for this project have been good route planning, with related fleet adaptation, and being to offer convenient customer focused services. Essential for the continuation of the concept is also the political backing in the city council.

3.1.5 Key Results and Achievements

Sustainability impacts

- Direct cost of journeys for the passenger has been reduced by 100%; increasing the number of journeys taken by bus (costs indirectly covered by taxes).
- Reduced road maintenance costs due to reduced traffic.
- Less investment required to provide parking facilities.
- Reduced air pollution and CO₂ emissions.
- Declined annual growth rate in private car sales (from 6.8% in 2008 to 0.5% in 2012).

Cost-effectiveness

Even though no comprehensive analyses of the overall costs and benefits of the initiative have been made, it can be noted that multiple co-benefits (see above) have been achieved through this initiative.

Challenges, lessons learned and potential for further development

The users have been very satisfied with the service so far. Route planning has been easier with good statistics collected on how passengers use the buses. The future challenge is mainly how to optimise the routes.

Taxi drivers are concerned about tourists, especially visitors arriving by cruise ships, who have started using the buses instead of taxis. The city has 60 taxi drivers who service the city. The taxi drivers would like to limit the use of the free buses to the inhabitants of the city.

4. Iceland

4.1 Biophilia Educational Project

Case Description *

- *Country:* Iceland, Denmark, Sweden, Norway, Finland, Åland, Faroe Islands and Greenland (Region: Europe).
- *Geographic scope:* Regional & National.
- *Theme:* Sustainable Lifestyles and Consumption.
- *Type of Initiative:* Information, awareness-raising, education.
- *Lead actor:* Ministry of Science, Education and Culture in Iceland.
- *Type of lead organization:* Government.

Budget

For 2014–2015, the total budget is EUR 857,300.

Partners

The Nordic Council of Ministers, Björk Guðmundsdóttir, the City of Reykjavík and the University of Iceland.

Status

Ongoing until 2016.

Next steps

The Biophilia Educational Project is implemented and further developed in Nordic schools during 2014–2016, as part of the Nordic Council of Ministers' Nord-Bio initiative. During this time, the Biophilia app suite will be a central element in workshops and study activities combining science, creativity and technology. A formal evaluation of the program will be conducted in 2016.

Contact person for more information

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

4.1.1 Introduction

The Biophilia Educational Project is an educational program developed in Iceland, which uses music and creativity to spark children's interest in the sciences and nature. The educational program includes teaching apps, games, animations, music and academic essays on science and nature. In the program, creativity is used as a teaching and research tool, where music, technology and the natural sciences are linked together cross-sectorally in a new and innovative way.

The concept builds on the dynamic collaboration of academics, scientists, artists, teachers and students at all academic levels. It creates a platform for dialogue and debate, which encourages both personal and social development, thereby contributing to a sustainable society where new approaches are actively explored.

The project has been developed by Björk Guðmundsdóttir, the City of Reykjavík and the University of Iceland. It was launched as part of Iceland's 2014 presidency in the Nordic Council of Ministers and is being piloted in selected schools in the Nordic countries.

4.1.2 Objectives

The Biophilia Educational Project aims to inspire children to explore their own creativity, while learning about music, nature and science through new technologies, using interactive and cross-sectoral teaching methods. It creates a platform for dialogue and debate, which encourages both personal and social development.

One of the goals is to contribute to a sustainable society where new approaches and solutions to problems are actively explored. Biophilia touches upon many of the most important issues related to creating a sustainable future, i.e. education, creativity, innovation and cross-disciplinary thinking. The aim is to engage children in learning how to make better use of these resources and create value in new ways. The project targets children from ages 10 to 12 years, but can be applied to younger or older children as well.

The Nordic Biophilia project's objectives are:

- To promote innovation in schools through the development of educational methods which combine natural sciences, creativity, and technology.
- To break up traditional teaching practices through a cross-disciplinary approach, across all ages, subjects, and disciplines.

- To set up a Nordic collaborative network that will share experiences and ideas and further develop the project based on common Nordic values.
- To encourage young people's interest in creativity, natural sciences and technology, and thus progressively increase the competitiveness of the Nordic countries.

4.1.3 Activities

The project is based on Björk's Biophilia app suite of music and interactive, educational artefacts. Each song from the album has a separate science theme and a musicological theme to go with it. The music teachers and natural science teachers will ideally work together and give short introductions to the science and musicology. The children then use the apps to familiarize themselves with the themes in question and learn through hands-on participation, composition and collaboration.

Each app has its own theme, in connection with a corresponding song and combines a natural element with a musicological feature. The content in each feature includes:

- An interactive game based on the song's scientific and musicological subject matter.
- A musical animation of the song.
- An animated score.
- Lyrics.
- An academic essay focused on a different science topic/theme.

For instance, in the song Mutual Core, tectonic plates are the science topic and chords are the main musical element. The aim of using the apps is to spark interest and make science and music more accessible.

4.1.4 Success factors

Through the Biophilia Educational Project the Nordic countries are working together to create new teaching methods by combining the use of creativity and technology. Emphasis is put on each country developing the teaching guidelines according to each local situation and resources at hand. The Nordic network will gather the different ideas and methods and share them with all interested parties. The aim is to create a pan-Nordic collaborative teaching initiative, where innovation and education meet.

4.1.5 Key Results and Achievements

Novelty

The Biophilia Educational Project is a ground-breaking project, which was piloted in the city of Reykjavik in Iceland, and is piloted in selected schools in the Nordic countries during 2015–2016. The project presents an example of dynamic collaboration between different areas in society, such as schools, cultural institutions as well as science and research institutes. Biophilia was selected as the educational and cultural flagship project for Iceland's presidency of the Nordic Council of Ministers in 2014 and is part of the NordBio initiative, where Nordic experts will pool their efforts in working on projects promoting sustainable utilisation of the living natural resources. The focus is on the interests of both society at large and the environment *per se*, and on facilitating the restructuring of a competitive economy as well as new methods in youth education.

Sustainability Impacts

Workshops for local children featured on the original Biophilia tour. Primary schools in Reykjavík have participated in experimental teaching using Biophilia with great success. The Biophilia Educational Project has the potential to bring arts experience to children who might otherwise not have access to it.

5. Norway

5.1 Enova's Energy Challenge – a digital energy education concept for primary schools

Figure 1: Students completing the experiment of the first task in Energy Challenge: "A Chain Reaction"



© Enova SF.

Case Description *

- *Country:* Norway (Region: Europe).
- *Geographic scope:* National.
- *Theme:* Sustainable Lifestyles and Consumption. Energy.
- *Type of Initiative:* Capacity-building and technology transfer. Information, awareness-raising, education.
- *Lead actor:* Enova is the lead actor. Enova SF is a Norwegian National Energy Agency owned by the Norwegian Ministry of Petroleum and Energy.
- *Type of lead organization:* Government.

Budget

The development of the concept has cost between EUR 350,000–450,000, which includes production of four films, building the digital platform and developing its content.

Partners

Subcontractors to Enova SF involved with implementing this concept together with ENOVA are: NTNU Skolelaboratoriet, Dinamo, and Snøballfilm.

Status

Ongoing.

Contact person for more information

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

5.1.1 Introduction

Enova has launched a digital educational concept for teaching primary school students about energy. The focus is on learning about energy: What is energy; What can energy be used for; What are the different energy sources; What is the link between energy use and climate change and what are the consequences of climate change? The target group is teachers, who get a digital “toolbox” for implementing four (4) two-hour school lessons. The “toolbox” includes presentations, a film for each theme and different types of tasks for the students to do in class and at home. Time for these types of lessons has been allocated in the official curriculum in Norwegian schools. The primary focus of the concept is on schoolchildren aged from 9 to 12. The concept was launched in 2014 and the target is that all 3,000 primary schools in Norway start using the toolbox.

5.1.2 Objectives

The aim of the project is to strengthen students’ understanding and awareness of energy use and its link to climate change and explain what kinds of solutions exist for addressing such challenges. The goal is to raise school children’s awareness and increase understanding as early as possible.

One of the primary objectives has been to design a cost effective, awareness raising and lifestyle-changing concept, which is easy to distribute, maintain and update. The concept is based on the Rainmaker concept for educating students about energy use and sustainability was launched in 2002. It was highly successful and is still used in several European countries. The Rainmaker concept adoption in Europe was financed by the Intelligent Energy Europe program.

The goal is to have all 3,000 primary schools in Norway use the new web based concept in their normal curriculum.

5.1.3 Activities

The digital concept includes everything a teacher needs for implementing four energy related lessons for children aged from 9 to 12. The concept includes four films, which can be used for the lessons, ideas for homework, ideas for tasks and projects for the students to do during lessons. The focus is on climate change and finding solutions for the problems. It also serves to raise awareness of the impacts on climate change, which are caused by energy choices and usage in different regions of the world.

5.1.4 Success factors

The to date established criteria for measuring success are:

- How the digital learning concept contributes to spreading the knowledge of Enova SF's activities and goals.
- The number of schools and teachers using the tool.
- The effectiveness of the tool via qualitative evaluations done both the teachers and the students (Self-evaluation).
- How anchored the tool is in the official curriculum.
- The tool is user-friendly and functions correctly.

One of central success criteria will be securing the commitment of teachers to this approach. Another critical success factor is giving adequate technical support to those teachers needing help getting started. So far, both teachers as well as students have shown interest and high motivation to apply the toolbox. The goals, which have been set regarding enrolment, have been exceeded.

5.1.5 Key Results and Achievements

Sustainability Impacts

The feedback received so far indicates that students have been highly motivated by the concept and that the teachers appear pleased with having an up-to-date tool that helps the planning and implementation of lessons in a subject which is perceived as challenging to teach.

Cost-effectiveness

The digital concept is more cost efficient in the longer term than a paper based educational concept, which previously used by some schools. The contents of the digital platform are easy to change and distribute when the concept and its contents are in need of updating to reflect the newest information available or current events.

Challenges, lessons learned and potential for further development

Especially teachers who are new to teaching are eager to adopt the concept and the tools. Other teachers have been somewhat slower to adopt the tools. One of the lessons learned so far has been that some teachers need support in IT-related issues in order to effectively apply such tools.

5.2 The Sustainable Backpack



Case Description *

- *Country:* Norway (Region: Europe).
- *Geographic scope:* National.
- *Theme:* Sustainable Lifestyles and Consumption.
- *Type of Initiative:* Capacity-building and technology transfer. Partnerships and voluntary agreements. Information, awareness-raising, education.
- *Lead actor:* The Norwegian Centre for Science Education.
- *Type of lead organization:* Government, Academic institution/research center.

Budget

EUR 1.85 million funding was available in 2014. Of this, EUR 1.15 million was used on school projects. EUR 0.7 million was used for salaries, travel costs for teachers and employees, conference and network meetings as well as work on the webpage natursekken.no

Partners

The Sustainable Backpack is a national priority initiated jointly by the Ministry of Education and Research and the Ministry of Climate and Environment to support Norwegian schools to implement Education for Sustainable Development (ESD). The Directorate for Education and Training and The Norwegian Environment Agency have the responsibility of implementing the Sustainable Backpack together with the Norwegian Center for Science Education.

Status

Ongoing.

Next steps

The program will continue through 2015 and beyond. The future development vision includes increased integration with standard teacher education and the vision is that all teachers should be able to participate in the sustainable development courses. A prerequisite for this would be increasing the funding for the schools to enable increased teacher participation.

Contact person for more information

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

5.2.1 Introduction

The Sustainable Backpack is a national initiative for Norwegian primary and secondary education, aimed at integrating education for sustainable development (ESD) into mainstream education. The goals of the Sustainable Backpack are to influence attitudes toward and improve proficiency in issues related to sustainable development among teachers and students. Education for sustainable development is supported by enabling networking between teachers, schools and teacher education experts, organizing teacher professional development (TPD) courses and by providing economic support to school projects. About 600 primary and secondary schools in Norway have participated in the program since the start in 2009. Annually some 150 schools participate.

5.2.2 Objectives

The aim of the program is to promote students' understanding and awareness of sustainable development and global environmental challenges and to give them competencies, which can help them find solutions to current and future environmental problems both locally and globally through increased understanding of the impact of local actions. The program also develops teachers' awareness, understanding and competence in sustainable development education for primary and secondary schools.

5.2.3 Activities

Schools can apply to the Sustainable Backpack program for support (financial support and teacher training) to develop and implement sustainable development projects or programs. By taking part in the program, the teachers become part of a professional learning community for ESD. In the network, teachers meet other teachers and their supervisors three times a year. The first annual meeting is a national conference for all teachers in the beginning of the school year in September, followed up by two regional network meetings, one in the autumn and one in the spring. At these network meetings, the teachers get relevant scientific and pedagogical content training in addition to supervision on the ESD projects or programs they develop and conduct at their school.

The requirements for ESD projects or programs that can be supported by the Sustainable Backpack are that the teaching is inquiry-based and inter- or multi-disciplinary, and that part of the teaching is carried out at alternative learning arenas outside classrooms. The schools are also encouraged to collaborate with external partners like the local community, NGOs, museums or businesses in their local community.

Teachers participating in the Sustainable Backpack program are required to participate in the national conference and the two network meetings. In addition, they are obliged to describe their project/program so that it can be communicated to others. The school (school-leader/headmaster) is obliged to facilitate the teachers meetings and the inter- or multi-disciplinarily work at the school and to make a plan for permanent establishment of the project/program at the school.

5.2.4 Success factors

Essential for the success of the concept is building commitment in school leaders. The leaders should ideally gain a clear vision and ideas on how to integrate sustainable development in ordinary teaching. Building teacher competence is also important to be able support integrate the concept into the curriculum and ordinary teaching. It is also key to create local relevance.

5.2.5 Key Results and Achievements

Sustainability impacts

600 primary and secondary schools in Norway have participated in the program. The program has enhanced teachers' engagement and understanding of sustainable development as well as increased teachers' use

of the local environment for education related to sustainable development. The program has also increased the use of practical, varied, multidisciplinary and exploratory teaching in new learning contexts. The collaboration with external actors has increased the teachers' competencies and has had a positive impact on the motivation of both teachers and students. The program has resulted in more environmentally conscious students.

Cost-effectiveness

An external evaluation made in 2014 concluded that the funds have so far been sufficient and have been used efficiently.

Challenges, lessons learned and potential for further development

Important for the success of the implementation at a school is a committed school-leader with a clear vision and ideas on how to integrate sustainable development in ordinary teaching. Competent teachers who support and implement this shared vision into their curriculum and teaching are also required. It is also essential to create local relevance. The courses and conferences are the most important part of the program in terms of capacity building. Evaluation skills could be improved, e.g. for evaluating the projects. The concept could easily be adapted to other countries.

5.3 Svanhild's Travels learning concept by the Swan label



Case Description *

- *Country:* Norway (Region: Europe).
- *Geographic scope:* National & Regional.
- *Theme:* Sustainable Lifestyles and Consumption.
- *Type of Initiative:* Information, awareness-raising, education.
- *Lead actor:* Swan label.
- *Type of lead organization:* NGO/Civil society.

Budget

The applications and materials are free for the users. A small administration fee, covering postal fees, is paid by daycare centers when ordering the activity pack.

Partners

Partners in developing the concept have been the Ministry of Children, Equality and Social Inclusion and the Barnehafeforum, an organization representing and supporting the development of the daycare sector.

Status

Ongoing.

Next steps

During the coming year, the goal is to distribute approximately 1,000 Svanhild's Travels activity packs to Norwegian daycare centers.

Contact person for more information

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

5.3.1 Introduction

Svanhild's Travels is a Norwegian learning concept for daycare children, which promotes understanding of nature and sustainable consumption habits and choices, through the use of storytelling. It includes teaching materials for daycare centers and interactive web- and mobile applications, which can be used by both daycare centers, preschool children and their parents.

In the concept, Svanhild, a well-known Norwegian storybook figure, is used to tell stories from which children can learn about sustainable

consumption and nature in an inspiring and positive way. Attitudes toward the environment are created early, which is why preschool age children are especially targeted by the concept.

Svanhild's Travels is a learning concept developed by the Swan label, the Nordic eco-label. It is actively used by some daycare centers in Norway.

5.3.2 Objectives

The Svanhild's Travels learning concept aims to inspire children to learn about sustainability and to teach that each person can have an impact on the environment by making sustainable choices. The goal is to engage children and parents on an emotional level in order to create a mindset that inspires good consumer choices. The objectives for the Svanhild learning concept are linked to one of the objectives for daycare education in Norway, which is stated as follows:

"It is a goal that children shall begin to understand sustainable development early. This includes nurturing the love of nature and creating an understanding of the interplay in nature and between nature and people."

5.3.3 Activities

The Swan label has developed a communication concept for small children between ages 5 and 6, which instead of focusing on distributing general environmental information, uses stories built around a Swan labelled product's lifecycle to teach about sustainability. The stories all include a different voyage made by the well-known story figure Svanhild, where the stops along the route are defined by the different phases a products goes through in its lifecycle. The stories aim to illustrate and inspire good consumer choices.

The communication concept includes web pages, where the stories are illustrated by an interactive application. The application can be used by daycare teachers and parents with young children. The concept also includes mobile applications for smart phones and tablets, which enable older children to engage through a media they are used to using. The applications are free and can be used both at home or, as a more advanced version, at daycare centers. The concept, furthermore, includes an activity pack for daycare centers interested in using it in their teaching. These activity packs are provided by the Swan label, which aims to initiate nature awareness in children.

The daycare center activity pack includes the following elements:

- Seven stories, which can be read aloud in seven different daily gatherings of daycare children.
- A postcard from Svanhild.
- Postcards the children can take home.
- A large poster, which can be used in group meetings to illustrate the discussion.
- Tasks and suggestions for inspiring activities.

In addition to the above, a magazine is distributed through partners and other channels and online information is provided for teachers. The online information aims to give guidance and support to teachers for teaching of sustainability related subject matter.

5.3.4 Success factors

Key success factors to promote the adoption of the Svanhild learning concept in daycare centers are building awareness of the concept and training the daycare workers in using the concept and raising competence of the teachers in sustainability related matters. Effective communication and marketing as well as training are essential to do this.

5.3.5 Key Results and Achievements

The activity pack, which is part of the Svanhild's travels concept meant for daycare centers, has been distributed to approximately 600 daycare centers. The concept was initially tested in several daycare centers and the feedback received was very positive. The children like the stories and the tasks they get to do, and the teachers feel that the concept is easy to use. Feedback from parents indicates that children now make sure that their parents buy Swan labelled products when purchases are made. Exact numbers are not available for how many families or children use the applications, but feedback received from the users so far has so far has been positive.

Challenges and potential for further development

Limited funds have been available to communicate the concept. More resources would be needed for getting the material to daycare centers and for communicating the concept more effectively.

6. Sweden

6.1 Climate Programme for Gothenburg

Figure 2: Public transport and rental bikes in central Gothenburg



© 2015 Peter Rydberg.

Case Description *

- *Country:* Sweden (Region: Europe).
- *Geographic scope:* Local.
- *Theme:* Sustainable Lifestyles and Consumption. Sustainable urban development and cities. Sustainable Public Procurement. Awareness-raising and Education for SCP. Transports and Mobility.
- *Type of Initiative:* Policy frameworks and processes. Economic and financial instruments. Capacity-building and technology transfer. Research and development. Partnerships and voluntary agreements. Information, awareness-raising, education.
- *Lead actor:* City of Gothenburg.
- *Type of lead organization:* Government.

Budget

The committees and boards that are responsible for the strategies in the Climate Programme should incorporate the strategies into their regular budget and planning process. As part of the implementation, it will be necessary to make several major investments. Experience from work on green bonds will be valuable as will the development of various investment tools and financial decision-making models, the ultimate aim being to create long-term, sustainable solutions.

Status

Ongoing.

Next steps

The next steps will involve further choosing of indicators, measuring progress, further deepening the commitment to the strategy as well as planning further concrete actions.

Contact person for more information

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

6.1.1 Introduction

The city of Gothenburg in Sweden has a comprehensive Climate Programme, spanning 2050, where emissions, strategies and actions are interconnected. The city has also paved the way for the calculations of consumption and carbon footprint of its citizens.

For the city's part, the programme involves converting to renewable energy sources and reducing consumption of resource-intensive goods. The Climate Programme launched in 2014, and which strongly builds on a number of climate actions launched earlier, also includes creating opportunities for the residents of Gothenburg to reduce their carbon footprint, for instance by providing more efficient public transport, smart urban planning and supporting climate friendly activities such as urban farming.

The city of Gothenburg aims to be one of the most progressive cities in the world when it comes to addressing climate change. The city wants to show its citizens that it is possible to lead a good life without contributing to climate change and is prepared to do this with major per capita investments for climate actions in order to reach the climate goals.

6.1.2 Objectives

The Climate Programme aims to achieve the environmental quality objective: Reduced climate impact. Reduced climate impact means that in 2050 Gothenburg will have a sustainable and equitable level of greenhouse gas emissions. One objective is to influence the emissions on which the city has direct impact. Another objective is to reduce the emissions from the local companies and industries as well as from the consumption of the citizens of Gothenburg.

The programme comprises nine strategy objectives, which are area orientations and extend through to 2030. The aim is that when the strategy objectives have been achieved, results will be seen of the measures that have been taken in the follow-up of the intermediate objectives related to the environmental quality objective for 2035. Achieving the intermediate objectives will give a good and reasonable starting point for the final stage of the programme through to 2050.

Some key objectives regarding the focus areas of transport, energy, waste and urban development are:

- By 2020, the emission of carbon dioxide from the non-trading sector in Gothenburg will be reduced by at least 40%, using 1990 as the base year.
- Energy use in homes will be reduced by at least 30% and electricity use (excluding industry and transport) will be reduced by at least 20% by 2020, using 1995 as the base year.
- By 2035, emissions of greenhouse gases within the Gothenburg geographical area will be a maximum of two tonnes of carbon dioxide equivalents per person.
- By 2035, the consumption-based emissions of greenhouse gases by the people of Gothenburg will be a maximum of 3.5 tonnes of carbon dioxide equivalents per person.
- By 2030, all district heating derives from renewable energy sources, waste incineration and residual heat from industry.
- By 2030, the total use of primary energy for electricity and heat does not exceed 31 MWh per inhabitant.
- By 2030, the City of Gothenburg produces at least 500 GWh of renewable electricity and 1,200 GWh of biogas.
- Carbon dioxide emissions from road transport within the Gothenburg geographical area will decrease by at least 80% by 2030 compared to 2010.
- Carbon dioxide emissions from shipping in the Gothenburg geographical area will decrease by at least 20% by 2030 compared to 2010.
- The climate impact of citizen's air travel will be reduced by at least 20% by 2030 compared to 2012.
- By 2030 the climate impact of food consumed in the City of Gothenburg will be reduced by 40% compared to 2010.
- The climate impact from our purchase of goods and materials should decrease. A target for 2030 will be set before 2018.
- The volume of household waste per person in Gothenburg will be reduced by at least 30% by 2030 compared to 2010.

6.1.3 Activities

As a part of the Climate Programme Gothenburg has set ambitious, measurable, climate targets on short and long term. As a part of the strategy, the city has started to measure the climate impact of consump-

tion of its inhabitants, which is a new approach. A key element of building commitment to the Climate Programme has been a series of workshops for key stakeholders. The city also used public consultations on the climate programme to involve citizens. The Climate Programme is supported by numerous actions on a broad scale, some of which are outlined below.

Some examples of actions focusing on energy and environment are:

- Gothenburg will phase out natural gas and oil in district heating production, and will investigate new climate-neutral solutions, such as more excess heat and heat storage. First priority though is increased energy efficiency in buildings and industry.
- A congestion Tax has been taken into use in order to improve accessibility on the roads, reduce emissions and part-finance the West Swedish Agreement. The West Swedish Agreement is a series of infrastructure initiatives intended primarily invest in increased public transport.
- Low-energy preschools have been built/planned and Gothenburg has been taking the lead within Sweden.
- Biogas production from wood based raw materials is promoted and the GoBiGas plant, inaugurated in 2015, is the first of its kind.
- Connection possibilities have been established for ships arriving in the port to electricity grid and district heat.

Some examples of initiatives focused on promoting resource efficient consumption are:

- “Recycle park” has been launched, where usable things such as clothes, furniture, bicycles or construction material can be given to others instead of thrown away.
- “Tage” is a municipal intranet site through which City of Gothenburg administrations and companies can advertise their surplus office equipment.
- “Cycle-speed-streets” have been launched where car traffic has to adjust to the bicycle traffic.
- Bike sharing is offered in the central part of the city.
- All schools serve vegetarian meals at least once a week with the goal of “Eco friendly meals”.

- Collection of textiles from apartment buildings is offered in order to promote reuse or recycle.
- The Port of Gothenburg is investing heavily in increasing the proportion of goods carried by train. In 2000, a total of 22% of all containers were transported to and from the port by train. In 2013, the proportion was 48%.
- Carbon Offsets of Official Journeys in order to compensate for the emissions used by transports.

A unique feature is that financing of the initiatives needed to achieve the goals is in part achieved by giving out Green Bonds to finance sustainable initiatives.

6.1.4 Success factors

Some key success factors for the climate programme are building stakeholder commitment to the climate programme, setting measurable targets and finding good ways of implementing and financing concrete actions.

6.1.5 Key Results and Achievements

This is an ongoing project. The impacts outlined below were achieved in Gothenburg before the formal Climate Programme was accepted by the city council in 2014. These are related to previously set climate related goals and are now also part of the comprehensive Climate Programme.

Novelty

Measuring the climate impacts of consumption of its inhabitants is an innovative and challenging aspect of the Climate Programme. The city of Gothenburg has been the first in the world to use so called Green Bonds to finance different types of sustainable initiatives. About 250 MEUR have been collected and invested in e.g. electric cars, biogas production and water cleaning projects. The Green Bonds involve reporting on the impact of the issue and how the proceeds will be used.

Sustainability impacts

Within the framework of climate action in Gothenburg, and since 2014 under the comprehensive Climate Programme, impacts have been reached especially in the transports and energy sectors:

- Air particle content has generally decreased over the past few years.
- 50% of all containers to the port of Gothenburg are transported onwards by train – which has resulted in 400 fewer articulated lorries per day in the region's traffic.
- The number of biogas filling stations has increased from 1 in 1998 to 23 in 2014 in the Gothenburg region.
- Congestion taxes have occasionally reduced traffic by 11%.

Through active urban planning measures, the number of people who live close to public transport has increased by 45,000 in the Gothenburg region.

Challenges, lessons learned and potential for further development

It is important to reserve project resources for building commitment to the climate programme. Workshops with the main stakeholders have been an important means to achieve this. Choosing relevant indicators and finding scientifically relevant ways of measuring baselines and progress is a challenge, but it is essential to be able to track performance and the achievement of goals as well as the impact of actions. Cooperation with researchers is important to make it possible to find scientifically valid ways to measure progress.

A specific challenge is influencing consumption of citizens, as there is no clear owner within the city administration for promoting actions linked to reduced consumption.

6.2 Healthy and eco-smart dietary recommendations by the Swedish National Food Agency

Figure 3: Find your way to eat greener, not too much and be active! New Swedish Dietary Guidelines



© 2008 Swedish National Food Agency

Case Description *

- *Country:* Sweden (Region: Europe).
- *Geographic scope:* National.
- *Theme:* Sustainable Lifestyles and Consumption.
- *Type of Initiative:* Information, awareness-raising, education.
- *Lead actor:* Swedish National Food Agency.
- *Type of lead organization:* Government.

Budget

The project has invested in testing the recommendations with focus groups and in developing communication materials for the “Hitta Ditt Sätt” (“Find Your Way”) concept. The monetary investment in the project (focus group study and communication materials) has been approximately EUR 50,000 plus the work time used for developing the dietary guidelines.

Partners

In the preparation and launching the guidelines there has been co-operation with The Public Health Agency of Sweden, The Board of Agriculture, The Swedish Environmental Protection Agency and other reference groups and public agencies working with environmental and food related questions.

Status

Ongoing.

Next steps

The next steps in the project are to communicate the dietary recommendations to key stakeholders, such as dieticians, nurses and teachers, whose role is to inform and educate consumers and to get them to commit to making lifestyle changes. The project will be further evaluated at a later stage.

Contact person for more information

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

6.2.1 Introduction

The kind of food we eat is important for our health and wellbeing and also for the environment. One fourth of the climate impact of households comes from the food we eat or throw away. These are the reasons why the Swedish National Food Agency has produced new dietary guidelines and related promotional materials, which highlight how consumers can make healthy and eco-smart food choices in their daily lives. The aim is to encourage people to learn more about healthy and eco-smart food choices and how to minimize food waste.

The agency launched new dietary guidelines in 2015. The eco-smart dietary guidelines are based on extensive research and the dietary guidelines published by the Nordic Council of Ministers (Norden) in 2013. The agency works towards promoting healthy dietary habits, safe foods and fair practices in the food trade as well as promoting eco-smart food choices.

6.2.2 Objectives

The fundamental objective is to improve national health. The objective of the dietary guidelines is to promote consumers' healthy and eco-smart food choices based on the newest scientific research.

6.2.3 Activities

The agency launched its new dietary guidelines in 2015. They aim to support consumers in their everyday food choices and for the first time especially highlight climate smart food choices, the importance of energy balance and exercise.

The guidelines recommend increased consumption of plant based foods: vegetables, especially root vegetables and beans, berries, whole grains and vegetable oils. The guidelines further recommend that consumption of meat should be reduced and environmental, and ethical considerations should be taken into account when choosing what kind of meats and fish is consumed. A new element in the dietary recommendations is that practical tips are an essential part of the guidelines. The tips give ideas on practical ways of eating healthy and smart – ways that fit the consumers' lifestyle. Some key concepts which support the adoption of the dietary guidelines are the following:

Hitta Ditt Sätt – Find Your Way

The “Find Your Way” communication concept presents small steps, which promote more healthy and sustainable eating habits. Each dietary recommendation is linked to information on the positive environmental impacts of the food choices. The aim of the concept is to inspire and motivate lifestyle changes.

Nyckelhålsrecept – Keyhole Recipes

The “Keyhole Recipes” concept presents inspiring examples of how more healthy and sustainable meals can be prepared. Healthy and sustainable food products are marked with the keyhole symbol. The symbol use is free for companies.

Matvanekollen – Diet Check

The “Diet check” is an application, which can be used to check how healthy a diet is and to evaluate what kind of dietary changes would be good to make.

6.2.4 Success factors

Key for the success of the adoption of the dietary guidelines is succeeding to communicate the guidelines to consumers in a way, which achieves behavioral change. Key stakeholders and gatekeepers in the communication are e.g. dieticians, nurses and teachers, who are in a position to distribute information to the public and especially to vulnerable groups. These gatekeepers are targeted with systematic communication measures by the Swedish National Food Agency.

6.2.5 Key Results and Achievements**Novelty**

The incorporation of environmental and ethical recommendations in the dietary guidelines seems to be quite unique internationally. Few national level guidelines by food agencies include recommendations for a healthy diet, where sustainability and ethical aspects are combined with recommendations for energy balance and exercise.

Challenges and potential for further development

The challenge is reaching the public and consumers and especially socioeconomically challenged groups. Even if people know what a healthy diet is, ingrained behaviors are difficult to influence. Therefore, communication efforts target especially key groups such as dietitians, teachers and nurses.

Sustainable Public Procurement

7. Denmark

7.1 New circular business models: focus on purchases, work clothing and the textile service industries

Figure 4: Members of the working group wearing working clothes



© Herning Municipality.

Case Description *

- *Country:* Denmark (Region: Europe).
- *Geographic scope:* Local.
- *Theme:* Sustainable Public Procurement.
- *Type of Initiative:* Public and Private Investments.
- *Lead actor:* City of Herning.
- *Type of lead organization:* Government, Local Government.

Budget

Approximately EUR 27,000.

Partners

VIA University College TEKO (design school).

Status

Starting date 1/9/2013. Ended 31/10/2014.

Next steps

The City of Herning has introduced the concept of circular economy to other new tender processes. The City of Herning also plans to look at circular economy in a broader sense, including the aspects of commercial applications and business development.

Contact person for more information

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

7.1.1 Introduction

In order to use public demand as a lever for green development, the City of Herning in Denmark started to prepare a model for a circular economy in 2013. The project's starting point was the purchase agreement between De Forenede Dampvaskerier and the City of Herning on renting, washing and repairing of work clothes for the city's technical operations department. The City of Herning decided to find out how to include reuse and recycling of work clothes into daily operations in the purchase and supplier chains, both practically and legally. Results include a general guide into circular economy, which can be used in other purchasing areas and by other municipalities.

7.1.2 Objectives

The challenge of the City of Herning in the beginning of the project was that all new employees of the technical operations department received brand new work clothes and whenever an employee resigned the clothes were discarded, regardless of the quality. Also when the current textile service contract would expire, all work clothing would be discarded. The discarded work clothes were not recycled.

To solve this problem, City of Herning started a circular economy project with the following objectives:

- To define operative and objective criteria for reuse of work clothing.
- To adjust the current textile service contract in order to introduce a circular economy based model to this specific purchase area.
- To develop a general guide for incorporating a circular economy based model into public tenders, which can be used in various purchase areas and by other public entities.
- To find commercial recycling solutions for used work clothes.

7.1.3 Activities

During the first phase the criteria for reuse were defined. User culture, signal value and changing attitude towards used clothes were discussed with the employees. Subsequently, objective criteria in reference to official standards (EN 20471:2013, ISO 105-A02 and A03, SNV 195651) were described (with Danish Technological Institute acting as consultant). Finally, the implementation of procedures and control functions for the criteria were agreed on in cooperation with the textile service company De forenede Dampvaskerier (DFD).

The second phase of the project consisted of introducing circular economy aspects to the current contract. In order to transfer work clothes in use to the next contract it was necessary to make an additional contract (allonge) to the current contract. An allonge includes a statement of legal terms and conditions for transferring materials and a calculation model for determining net present value of the materials. The allonge must be mutually approved and legally compliant.

The project also compiled a general guide for incorporating a circular economy based model into public tender and contracts (in Danish). The guide is open and accessible to all public entities. The points of attention include:

- Topics relevant for introducing a circular economy based model.
- The importance to consult with the industry before stating conditions!
- The need to define criteria and relevance of requirements in relation to circular economy objectives.
- Tender requirements must be accurately reflected in the contract.

- The need for e.g. follow-up clause, penalty provisions or a bonus scheme should be considered to provide incentive for applying the concept of circular economy.

As part of the project, the recycling of the work clothes was studied by students from VIA University College TEKØ. They innovated new options for recycling and conducted open dialogue with a range of relevant industries.

7.1.4 Success factors

The project has proved that advancing circular economy is possible in practice, including a concrete guide on practical implementation. The developed criteria are based on official standards and therefore widely applicable. Terms of public tendering have been investigated in relation to a circular economy based model, which benefits other public procurers.

7.1.5 Key Results and Achievements

The main results of the project consist of a set of criteria, a general guide, innovative ideas and actual reuse of textiles. Within the project, it was found out, that logos on the work clothes cause problems for reuse. Hence, a written note on the logo issue has been made, with a recommendation for further study. An economic analysis of the impacts of the circular economy based business model has also been conducted.

In addition, the project has promoted dialogue with a number of companies and initiated a study of possibilities of other material reuse with companies (including building materials, insulation, furniture industry and fabrics).

Novelty

The project contained an element of novelty in the form of the criteria for recycling and disposal of work clothes and a general guide for implementation of a circular economy based model in public procurement. Both the criteria and the guide serve as a basis to build circular economy based models also in other industries and municipalities. From an innovation perspective, VIA University students also created a hundred innovative ideas and 17 recycled products during the project.

Sustainability impacts

Possible economic and ecological impacts were calculated during the project by FORCE Technology. Reuse of work clothes and transfer of work clothes, from the current contract to the next, would save EUR 6,700 and 1,011 tonnes of CO₂ in a 4 year period in Herning's technical operations department alone. This indicates a significant potential for financial savings and CO₂-reduction by disseminating the circular economy based model to other public procurement areas. The project also had positive social impacts through the dialogue conducted to define the criteria of reuse. A joint discussion among the workers of the technical department included issues such as the protection factor of the clothes, impacts for the environment and whether the workers feel comfortable using clothes that others have worn.

Cost-effectiveness

As calculated by FORCE Technology, the possible economic impacts of the project in a 4 year period would be EUR 6,700 in money saved. This number describes the savings made in service provider's costs, which in turn benefits the municipality through reduced price of the service. More specific calculations will be available after the four years' follow-up period in 2017.

Challenges and potential for further development

The concept of circular economy seemed to work in principle and have clear benefits. However, some challenges remain:

- Material transfer from old to new clothes, recycling of the fibers.
- Value assessment of the clothes: washing, tracing system, etc.
- Technical challenges: logos, colours, sizes, zippers and buttons, etc.
- To find a commercially viable business concept.

7.2 Partnership for Green Public Procurement



Case Description *

- Country: Denmark (Region: Europe).
- **Geographic scope:** National.
- Theme: Sustainable Public Procurement.
- Type of Initiative: Public and private investments. Partnerships and voluntary agreements.
- Lead actor: The Danish Ministry of the Environment.
- Type of lead organization: Government.

Budget

EUR 147,000 annually.

Partners

Municipalities of Copenhagen, Aarhus, Odense, Herning, Egedal, Sønderborg, Frederiksberg, Roskilde and Gladsaxe, Regions of Central Denmark and South Denmark, and VCS Denmark. The Secretariat is headed by the consultancy Plan-Miljø ApS.

Status

Ongoing.

Next steps

The next steps of the Partnership include expanding the Partnership with new members, enhancing internal exchange of experience in the Partnership, support implementation at local level, following the targets, and ensuring international exchange of experience. Strengthening of knowledge sharing and facilitation of learning are also important next steps. To emphasize the importance of green procurement a Nordic Green Procurement week is hosted in 2015.

Contact person for more information

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

7.2.1 Introduction

In 2006, the Ministry of the Environment and the three largest municipalities of Denmark (Copenhagen, Aarhus and Odense) entered into Partnership for Green Public Procurement (GPP). Since then the Partnership has been joined by a total of nine municipalities, two regions and a water company. The Partnership is a collaborative effort of public entities seeking to protect the environment and drive the market in greener direction by additional joint measures in the area of procurement. The Danish municipalities are responsible for the majority of public procurement, and the five regions also constitute a considerable procurement volume. Today the members of the Partnership represent about EUR 5.5 billion per year – which is about 13% of the annual public procurement in Denmark.

The Partnership is a shortcut for the municipalities to strengthen the specific work with green procurement and strong signal to suppliers on the market that they must stand ready with the best and most environmentally sound products. By setting and using uniform environmental criteria it becomes easier for the suppliers to comply with the criteria. The idea is: the more public authorities who use the Partnerships green criteria the more effect it will have on the market.

7.2.2 Objectives

The work of the Partnership is constructively and openly aimed at developing concrete green procurement criteria and targets that will make a difference to the environment, locally as well as globally, and at solving procurement challenges in targeted working group processes. The green procurement criteria and targets constitute a guide for municipalities wanting to incorporate environmental requirements in their procurement practices. Moreover, the Partnership is an important forum for sharing knowledge and procurement solutions.

7.2.3 Activities

The Partnership is based on joint, mandatory green procurement criteria and targets. It strives to renew previous procurement objectives and to formulate new objectives each year, leading to a positive effect on global and local environment. The Partnership offers a forum for visibility, sharing experiences with others, and access to environmental professional procurement knowledge and tools. It also encourages to think in long-term and to consider entire lifetime of the products and services, and finally by using uniform environmental criteria it becomes easier for the suppliers to comply with the criteria.

For its members, the Partnership sets the following obligations: To follow jointly specified procurement criteria and targets, to have a procurement policy in which environmental concerns play a significant part, to publish the procurement policy on the respective authority's website and to take actively part in the working groups established to solve joint procurement challenges and develop specific criteria within different product areas. The members of the Partnership start following the procurement criteria gradually and depending on the capacity of the member, it may require a long process before all criteria are in full use.

The Partnership is supported by a Secretariat financed by the Danish Environment Protection Agency. The objectives of the Partnership and the Secretariat are:

- To strengthen the organization of the Partnership, internal knowledge sharing and cooperation with relevant actors.
 - Various events: meetings, seminars and workshops.
 - Dialogue with external parties such as Eco-labelling Denmark.
 - Establishment of a system for knowledge sharing, so that members can easily find relevant examples, good practices and

references to employees with similar challenges in other municipalities.

- To expand the circle of partners and stakeholders to achieve more green procurement and make a greater impact on suppliers and manufacturers.
 - Finding new members.
 - Expanding visibility of the Partnership e.g. by a new website.
 - Collaboration with external stakeholders in planning and implementing of Green Procurement Week.
- To implement procurement objectives in a timely and useful manner.
 - Implementation of common binding green procurement criteria and targets.
 - Development of best practice cases.
 - Development of advisory material.
 - Development of a practical model for effective implementation of the GPP.
 - Designing and implementing a monitoring system.
- To update existing purchasing goals.
 - Continuous work with the green procurement criteria and targets includes update of existing criteria and targets, and development of new ones.
 - Old targets are continuously updated to reflect the latest knowledge and technology in the field, considering both national and international legislation.

7.2.4 Success factors

The growing number of members is a success indicator. Several public entities are interested in joining and the Partnership aims for at least four new members in 2016.

The Partnership supports implementation of environmental requirements on procurement and thus influences the market, making a positive impact on the global and local environment. The working groups allow joint learning and handling of joint implementation challenges, which offers the members a peer support based forum for development of green procurement.

7.2.5 Key Results and Achievements

Novelty

The binding procurement targets are a novelty in the Danish context. The launch of the Partnership has contributed significantly to knowledge sharing between the public procurers, this being another main novelty factor. Innovation takes place in the working groups handling joint implementation challenges, testing means of communication, and discussing the next generation procurement targets. The municipalities and regions have a need to get together and work on ways to bring procurement practices beyond the law to do more for the environment than is required.

Sustainability impacts

The partners follow the environmental criteria agreed in the Partnership. Following the green procurement criteria has an impact on environment, but the actual total environmental impact has not been calculated. Procurement cases in some member organisations of the Partnership show environmental and economic savings. One of the targets of the Partnership for 2014–2016 is to organize a thorough follow-up and collect data on environmental impacts.

Cost-effectiveness

The Partnership affects cost-effectiveness of public purchases by encouraging the members to work with the Total Cost of Ownership (TCO) methodology, providing good examples on cost effective green procurement and setting e.g. energy efficiency criteria within selected product areas. The members of the Partnership have agreed to use TCO calculations when procuring energy using products. Where national TCO methods exist these are the ones used (e.g. lighting and professional refrigerators/freezers).

Challenges and potential for further development

Main challenges of the Partnership include among other actual implementation of the green procurement practices in large organisations; collection of data on the actual volume and impact of green procurement and control of suppliers.

Experiences of the members show that it is a challenge to ensure that all links in the members' procurement practices – from local purchases to local childminder – understand the relevance of procurement objectives and comply with these. Therefore, it is important to work for establishing methods for implementation and follow-up of the partners' organizations.

8. Finland

8.1 Environmental strategy of Tampere Hall provides systematic procurement guidance

Figure 5: Main Auditorium of Tampere Hall



© Tampere Hall.

Case Description *

- *Country:* Finland (Region: Europe).
- ***Geographic scope:*** National.
- *Theme:* Sustainable Public Procurement.
- *Type of Initiative:* Public and private investments.
- *Lead actor:* Tampere Hall.
- *Type of lead organization:* Government.

Budget

The annual procurement budget of Tampere Hall is approximately EUR 500,000.

Partners

City of Tampere.

Status

Ongoing.

Next steps

Tampere Hall is currently starting a building project to expand the property and to renovate some of the old parts. Regarding the new part of the building the technical solutions are currently being planned. In order to begin the renovation phase the necessary procurement processes are in progress. Calculations of the carbon footprint have helped in planning the new part. Another target is to continuously increase the proportion of waste recycled.

In the future, probably in 2017, Tampere Hall will introduce solar electricity to the property, based on promising results of a solar potential study conducted in 2015.

Contact person for more information

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

8.1.1 Introduction

A strategic and systematic approach to procurement and continuous work with subcontractors has led to improved sustainability in Tampere Hall, a congress center owned by the City of Tampere, Finland. The environmental targets of Tampere Hall include minimising the carbon footprint and continuous improvement of environmental performance. The Nordic Swan label was awarded for the congress and meeting services of Tampere Hall in 2014. This made Tampere Hall the first Nordic congress center to receive the Nordic Swan label. Motiva Oy, a state-owned technology company that encourages efficient and sustainable use of energy and materials, awarded Tampere Hall with the Finnish Sustainable Public Procurer 2015 Award.

8.1.2 Objectives

The environmental targets of Tampere Hall include among others minimising their carbon footprint and continuous improvement of environmental performance. The environmental goals and the Swan label guide systematically guide Tampere Hall's procurement practices.

8.1.3 Activities

The strategic and systematic approach to procurement is guided by Tampere Hall's environmental strategy and the Swan label. Sustainability aspects are taken into account in three stages of the process:

- Prior to the actual procurement process the environmental aspects of planned purchases are analysed.
- During the individual procurement process, the environmental aspects and sustainable development goals are emphasised, and
- After the procurement, the suppliers and partners are encouraged to adopt the same level of environmental management.

This approach allows Tampere Hall to explore a variety of options of how to consider the environmental impacts of product groups, and to take into account impacts generated throughout the products' lifecycle. Taking into account impacts along the entire lifecycle offers a possibility to use new, innovative solutions which may be more expensive in the beginning but in the end have lower total costs (lifecycle costs).

Examples:

- Use of fair trade, organic and local food:
 - Fair trade, organic and local foods are favoured when available. Since 2009, Tampere Hall has followed the Steps to organic (Portaat luomuun) program for professional kitchens. Currently Tampere Hall are at the fourth level (out of six) in use of organic produce in food services, reaching for the fifth level. On the fourth level at least 8 and on the fifth level at least 20 significant items of organic raw materials (such as coffee, tea, cocoa, cereals, juice etc.) are in permanent use in the kitchen.
- Carbon footprint:
 - Tampere Hall tracks the carbon footprint of its operations. Carbon footprint of the food is calculated mostly based on information

received from wholesalers and it affects menu planning of the restaurant. Based on the calculations it is possible to offer B-to-B customers more climate-friendly meal choices.

- Continuous reduction of the amount of waste:
 - Tampere Hall pays continuous attention to reduction of waste and waste separation at the source.
 - Recyclability is emphasised in procurement through agreements with suppliers, where recycling of the used goods (e.g. building materials) is the supplier's responsibility.
 - Building and set-up of exhibitions and trade fairs have been identified as a major source of mixed waste. Consequently, the contractors now receive more specific guidance on how to sort the waste.
 - The disposable dishes used in Tampere Hall are biodegradable.

The amount of waste is measured by several different indicators. Over the years, the waste management has been organised to increase recycling and utilisation of waste materials, and to increase the proportion of waste that can be sorted on site. Some of the waste is recycled into new products, such as mascots made of well-worn fabric of the seat covers.

- Cleantech solutions:
 - Cleaning the kitchen premises is now done with Ozone water instead of chemicals. Ozone water is produced by an ozonator coupled to the cold water tap.
 - Tampere Hall has a titanium oxide coated bituminous roofing, which helps to depollute the air of nitrogen oxides. Titanium oxide functions as a catalyst for a reaction where nitrogen oxides convert into nitrates that are washed off the roof by rainwater.

8.1.4 Success factors

A continuous, holistic approach in environmental management which is founded on the Swan label and takes procurement strongly into account. The impacts of procurement decisions are monitored and used as feedback into guidance and to provide motivation for the continuous improvements.

8.1.5 Key Results and Achievements

Novelty

The strategic approach of Tampere Hall in environmental management takes procurement strongly into account. The Nordic Swan label guides Tampere Hall's environmental targets, which is seen in practice for example in procurement of food produce and other supplies, and in the use of innovative cleaning methods and other cleantech solutions, to the creation of which Tampere Hall together with suppliers has also contributed.

Sustainability impacts

Tampere Hall has managed to continuously increase the share of recycled and utilised waste. In 2014 the share of disposed waste was 0.23% and consisted only of broken porcelain plates, when 13.67% of waste was recycled and 86.10% utilised. In 2014, the use of energy for heating was reduced to nearly half the amount used in 1991, and there are also significant reductions in the use of electricity.

The annual greenhouse gas emissions of Tampere Hall have been measured from year 2011. Using the indicators of Green Building Council Finland, the CO₂-emissions are calculated for the property and the catering services. The emissions of the catering represent a third of the total amount. In addition to this, a total visitor-orientated carbon footprint is calculated. The 2014 carbon footprint was 4.3 kg CO₂/visitor, which is 0.5 kg CO₂/visitor less than in 2013 and 2012. A target to further reduce the carbon footprint is included in the environmental strategy of Tampere Hall.

Some of the greenhouse gas emissions are compensated by the air cleaning roof. A 130 m² area removes nitrogen oxides from the air to the same amount that a Euro5-marked passenger car produces over 15,000 km. The titanium oxide coated bituminous roofing already covers 2,050 m² of the roof. With the new extensions installed in June 2015 it will compensate for emissions equivalent to over 400,000 km of driving per year. The roofing material has a lifecycle of 50 years and a feature that lowers thermal load, which in turn reduces need for cooling. Titanium oxide also repels algae, which lowers the maintenance costs of the roof as well as reducing the amount of cleaning chemicals used.

Using ozone water in cleaning of the kitchen facilities has significantly reduced the use of chemicals. It has been possible to abandon nearly all cleaning chemicals without lowering the cleaning results. Procurement of the ozonator has lowered the cleaning costs and the device paid itself in less than a year's time.

Cost-effectiveness

Due to the environmental strategy of Tampere Hall the personnel is allowed to procure new, sustainable solutions, even if they are more expensive in the short-term than traditional solutions. Innovative solutions may become less expensive in use owing for diminished maintenance costs. For this reason, the lifecycle costs are emphasised in decision making.

Challenges and potential for further development

It has turned out that in planning of larger procurement processes, it may sometimes be laborious to find a suitable environmental criterion that can be scored.

8.2 Reduction of energy use in municipal buildings by an Energy Service Company (ESCO)

Figure 6: The main entrance of the Tikkurila Upper Secondary School, Vantaa, Finland



© 2012 Pekka Turtiainen, City of Vantaa.

Case Description *

- *Country:* Finland (Region: Europe).
- *Geographic scope:* Local.
- *Theme:* Sustainable Public Procurement.
- *Type of Initiative:* Public and private investments.
- *Lead actor:* The City of Vantaa.
- *Type of lead organization:* Government.

Budget

EUR 1.5 million.

Status

Ongoing.

Next steps

The follow-up period of energy saving investments will begin in June 2015. The ESCO has remote access to the energy systems of the 14 buildings for the next 8 years. To follow up energy savings the City of Vantaa meets with the ESCO quarterly and monetary issues are evened out once a year based on the amount of the savings.

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

8.2.1 Introduction

In 2011, the City of Vantaa in Finland started a procurement process for a contract with an ESCO to improve the energy efficiency of 14 municipal buildings. The justification for this approach was that the energy saving measures and associated cost savings would be realised more rapidly than would be possible if only making “traditional” investments from the City’s budget. The City decided to pilot ESCO services for 14 buildings over an eight year time period. These properties are representative for the City’s buildings in terms of their age, size, design etc. The long-term plan is to roll out engineering, procurement and construction services (EPCs) for further municipal buildings, if energy saving measures will prove successful. Before publishing the actual procurement notice, Vantaa carried

out a stakeholder engagement exercise on the use of ESCOs to carry out such work. Procurement objectives were defined and the City of Vantaa's climate targets were taken into account as part of the process. The City aimed to make energy-saving targets both clear and realistic. After consulting legal advice, Vantaa chose to use a negotiated procedure as the best option to utilise market potential and explore available options.

8.2.2 Objectives

The City of Vantaa decided to improve the energy efficiency of 14 municipal buildings by using the services of an Energy Saving Company (ESCO). The justification for this approach was that the energy saving measures and associated cost savings would be realised more rapidly than would otherwise be possible if making the investments from the City's budget alone.

The City decided to pilot ESCO services for 14 buildings over an eight year time period. These properties are representative in terms of their age, size, design etc. The long-term plan is to roll out EPCs for further municipal buildings if energy saving measures will prove successful.

8.2.3 Activities

Before publishing the actual procurement notice, Vantaa carried out a stakeholder engagement exercise on the use of ESCOs to carry out such work. Procurement objectives were defined and the City of Vantaa's climate targets were taken into account as part of the process. The City aimed to make energy-saving targets both clear and realistic. After consulting legal advice, Vantaa chose to use a negotiated procedure as the best option to utilize market potential and explore available options.

Subject matter was a contract for an Energy Service Company (ESCO) to improve the energy efficiency of 14 municipal buildings.

Procurement criteria:

- Selection criteria:
 - Previous experience of undertaking EPC services was a prerequisite. However, Vantaa decided not to restrict this to municipal EPCs, as experience in this area is relatively limited in Finland and the city wanted to encourage as much competition as possible. The value of the contract was relatively low – under the EC procurement threshold of EUR 4.85 million (threshold for

construction in 2011) – so it was most likely to be Finnish ESCOs that would be interested.

- Technical criteria:
 - The energy savings proposed by the ESCO had to be 100% guaranteed. The maximum repayment period was set at 10 years and indoor air quality must remain similar to the current standard. To promote innovative solutions from the participating companies, the procurement notice didn't define what energy-saving models should be used nor were any boundary conditions presented. Instead, the participants were given detailed initial information about the energy audits for four buildings enclosed with the notice, on the basis of which they were able to select and suggest energy-saving measures. The energy savings proposed by the winning ESCO in its bid were then guaranteed as part of the contract.
- Award criteria:
 - Four negotiations were carried out with each bidder in order to guide Vantaa's approach to the procurement. Aspects discussed included the targets, procurement principles, contract model, and final invitation to tender. The award criteria and their focus areas were selected so that they supported the targets set for the project. The award criteria set for procurement were:
 - EUR saved /year: 20%.
 - MWh savings/year: 20%.
 - Savings/year tCO₂e: 30%.
 - Savings that can still be made in 2023 (MWh): 30%.
- Contract management and monitoring:
 - The winning ESCO gave a 100% guarantee of the energy savings they proposed, as required by the City of Vantaa. Any savings above the proposed amount are split between the ESCO and the City and any shortfalls are made up solely by the ESCO. The consumption figures are verified from electricity and district heat meters and the implementation of savings is monitored in follow-up meetings held once a year. In the follow-up, the entire project, and not individual buildings, is examined. This means that if in one building the savings target is not reached, this can be compensated for if it is exceeded in another.

8.2.4 Success factors

The City of Vantaa was committed to the procurement of ESCO services and developed a model for including both the savings and the investments in the same procurement process. Analytical discussions with research parties and cooperation with legal services were also critical success factors.

8.2.5 Key Results and Achievements

All in all the procurement process was successful as the end result was in line with the original plan. Four companies responded to the procurement notice and the first investments in energy saving measures began in summer 2014. The ESCO's proposals of the amount of electricity savings were significantly higher than the internal audit estimation of the City of Vantaa. In terms of heat, the ESCO's proposals also tended to be higher, although the ESCO guaranteed significantly less water savings than the internal audits estimated feasible. The initiative is ongoing and final results will be available in 2023.

Novelty

In this pilot project, the City of Vantaa wished to encourage rather than stifle innovation through its procurement approach, i.e. using stakeholder engagement and a negotiated procedure. However, due to the fact that the City of Vantaa required proposed energy savings to be 100% guaranteed by the ESCO, the companies tended to be risk averse in terms of using innovative energy saving solutions. One of the measures proposed that is predicted to result in the most significant energy savings is LED lighting. It is foreseen that the procurement budget will still have some room for developing new solutions in the implementation stage. The number of different measures was not determined in advance, either. This will give the supplier freedom to choose the measures that are worth investing in, whilst ensuring that the measures specified by the City of Vantaa will be carried out. The investments have now been made in all 14 buildings and follow-up period starts in June 2015.

Sustainability impacts

Using effective and appropriate procurement procedures and energy performance criteria can reduce energy use significantly, which in turn lowers GHG emissions such as CO₂. Buildings and equipment must be effectively maintained in order to optimise efficiency. Transferring responsibility for energy efficiency to private entities and using incentives and

penalties to encourage high performance levels means that the contractor has a clear incentive for ensuring newly installed equipment is performing correctly and achieving energy savings. Over the lifetime of this energy service contract, the aim is to realise a total of 30,100 MWh energy savings in heat and electricity. According to an average EU household electricity consumption of 2,500 kWh,² this is an equivalent amount of energy needed to power over 12,000 homes for a year. It is estimated that in total GHG emissions will be reduced over the 8 year contract period by 7,500 tonnes CO₂ equivalent emissions.

Cost-effectiveness

The combined energy cost of the 14 municipal buildings is EUR 1.3 million per year. The total project investment will be EUR 1.5 million over the 8 years. The target of the contract period is to achieve savings of up to 30,100 MWh in heat and electric energy. This will cut 7,500 tonnes CO₂ eq. emissions. This means annual savings of over EUR 200,000 in the energy costs of the City of Vantaa, which corresponds to savings above 15% of total project investments.

Challenges and potential for further development

The City of Vantaa was determined to include both the saving and the investments in the same procurement process. However, there was no suitable procurement model available that would have covered as many buildings. Developing such a model based on experiences of other cities was time-consuming.

Staff involved in this pilot program concluded that energy service contracting has a great deal of potential and that it is a good way to improve the technical functionality and energy efficiency of buildings. They cited the following recommendations to public authorities wishing to establish energy service contracts:

- Gaining knowledge and expertise in energy efficiency is beneficial for project leads in order to effectively “sell” such projects to internal stakeholders.
- Keeping the targets clear in your mind from the start as they direct the entire process. All of the selected measures must be related to the targets.

² According to European Commission: EuroStat.

- Guidelines that are too strict may prevent potential contractors from presenting innovative solutions.
- The negotiated procedure challenges both the procurer and the contractor. It is important to gain mutual trust to achieve the desired end result. Suppliers must feel that trade secrets will be kept confidential.
- Making sure that the invitation to tender will comply with your targets, and that the strengths of bidders are taken into account.
- Where possible and necessary, taking advantage of legal expertise to help interpret EU public procurement law.
- Engaging with possible bidders in a transparent and open dialogue from the outset and taking on board their input. This will help in understanding their potential and perspectives, while treating them all equally.
- It is worth investing in pilot projects! The economic situation can provide inspiration for the market to develop effective ways of maintaining and renovating properties to save energy.

9. Iceland

9.1 Eco-labelled cleaning services in Reykjavík

Figure 7: City of Reykjavik office building



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Case Description *

- *Country:* Iceland (Region: Europe).
- *Geographic scope:* National.
- *Theme:* Sustainable Public Procurement.
- *Type of Initiative:* Public and private investments.
- *Lead actor:* The City of Reykjavík.
- *Type of lead organization:* Government.

Budget

The Green Cleaning Program did not receive any external funding.

Status

Ongoing.

Next steps

The Green Cleaning Program will continue as a part of the Municipal plan of the City of Reykjavík.

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

9.1.1 Introduction

In 2009 the City of Reykjavík, Iceland, decided to start using eco-labelled cleaning services. This means that all cleaning service providers either have a certified ISO 14001 environmental management system, are certified as providers of Nordic Swan eco-label cleaning services, or meet comparable criteria. Reykjavík's Green Cleaning Program aims to ensure that public cleaning contracts are fulfilled in a way which minimises adverse environmental and human health impacts. This involves a reduction in the overall quantity of cleaning chemicals used per m² cleaned, and ensuring that those chemicals used are less harmful to the environment and human health. In two pilot projects, the city included environmental criteria in two tenders for cleaning services. The cleaning costs were cut in half while the market share for eco-labelled cleaning services in Iceland increased substantially.

9.1.2 Objectives

The aim of the Green Cleaning Program in the City of Reykjavík is to obtain environmentally sound cleaning services for the city's operations. It is enacted through the procurement process. One of the goals is that all cleaning service providers either have a certified ISO 14001 environmental management system, are certified as providers of Nordic Swan eco-label

cleaning services, or meet comparable criteria. The program is underpinned by the city's stated environmental commitments, which were first included in the 2009 Environmental Action Plan. Now green procurement is endorsed in the City's Municipal plan.

9.1.3 Activities

Prior to implementation, a market survey was undertaken by the Procurement Office to assess the availability of eco-labelled alternatives on the market. It was discovered that, at that time, there was just one eco-labelled cleaning service provider on the market. Therefore, the Procurement Office's implementation team committed to the goal of all cleaning service providers having either a certified ISO 14001 environmental management system, being providers of Nordic Swan eco-labeled cleaning services, or meeting comparable criteria.

Two important pilot projects formed the beginning of eco-labelled cleaning service procurement process in Iceland. In March 2009, the cleaning contract for the new city office building (10,218 m² floor area) became the first procurement process conducted under the auspices of the Green Cleaning Program. In September 2009, a tender process was established for the cleaning contracts of 63 kindergartens (30,353 m² floor area) in the city.

The criteria and processes included in the tender documents were thoroughly researched, and a cleaning expert from Iceland's National University Hospital was also employed to analyse Reykjavík's cleaning needs. The pre-tender analysis showed that the cleaning frequency could be considerably reduced, generating positive results for the environment and the City's budget. Furthermore, by cleaning the offices during office hours, staff reacted more positively to the quality of the cleaning service provided, despite the lower frequency.

Procurement criteria:

- Technical criteria.
- Cleaning products:
 - Non-allergenic, readily biodegradable and free of high concentrations of volatile organic compounds. The contractor is required to inform the City about all cleaning products used, in order to ensure compatibility with the requirements.

- Award criteria:
 - 15 out of 100 points were allocated to an environmental management and 85 points to price. Bidders with a certified environmental management system, ISO 14001 or equivalent, or an eco-labelled cleaning service, such as the one certified by the Nordic Swan, or equivalent, were awarded 15 points. Bidders with a non-certified management system were awarded 7.5 points. The management system was required to have been in operation for at least six months.

9.1.4 Success factors

Including sustainability criteria in large public contracts can have a rapid and significant effect on the supply of products and services, particularly in small markets. The effect in Iceland was visible one year later when the tender for cleaning services for kindergartens in Reykjavik was published. The result was that a number of companies with certified environmental management systems or eco-labelled cleaning services participated in that competition. Overall, the cleaning frequency was lowered without it affecting the quality of the result. The change in service was also positively received by office staff when it was switched to take place during office hours. To operate the city in a sustainable way, including green procurement, is one of the objectives of the environmental policy of the City of Reykjavik, which is now a part of the Reykjavik Municipal Plan.

9.1.5 Key Results and Achievements

In the case of the new city office building, eleven bids were submitted but only one was awarded points for environmental management. That bid was ranked fifth relative to price but obtained the highest total score and was thus awarded the contract. The winning company provided cleaning services certified by the Nordic Swan. A cleaning service with a Nordic Swan eco-label also won the contract for the kindergartens.

Subsequently, the tender process led to a considerable increase in the number of applications for the Nordic Swan eco-label in Iceland for cleaning services, as well as a number of companies setting up and implementing certified environmental management systems. The program has resulted in environmental improvements, considerable cost savings and satisfied employees. However, the most impressive result of the project is its effect on the cleaning service sector as a whole in Iceland.

Novelty

During the Green Cleaning Program, the market share for eco-labelled cleaning services has grown substantially. In two years, the market share for eco-labelled cleaning services in Iceland grew from less than 10% to over 50%. Now, in 2015, all the major cleaning companies in Iceland have either eco-label or certified environment management system. The program led also to increased availability of other eco-labelled products and services since eco-labelling in the cleaning service sector caught the attention of other service sectors (e.g. tourist services, printing). The number of Nordic Swan eco-label licenses has grown to be five times larger from 2009 to 2015. As a consequence, suppliers have also increased their selection of eco-labelled products.

Sustainability impacts

Lowering the cleaning frequency resulted in a decrease in the use of cleaning products, water and less wastewater production. It is estimated that there has been a 65% decrease in chemical consumption in the cleaning of the new office building. This is a result of lower cleaning frequencies and an eco-labelled cleaning service. The decrease in the kindergartens is somewhat lower (33%) as the potential for less cleaning frequency was limited. Based on use of different cleaning methods, the amounts of water use and wastewater production have decreased from 2009.

By signing a contract with a cleaning company awarded with an eco-label, the environmental impacts were lowered and quality of the service was assured. More than 95% of the chemicals used in both cleaning services are eco-labelled. Plastic bags used in cleaning the office building reduced by 200 kg/year saving EUR 910. The number of complaints declined considerably in the office building. This is due to the increased quality of the cleaning performed during office hours and the quality requirement associated with the Nordic Swan eco-label.

The proportion of eco-labelled cleaning services purchased by the city has increased in proportion, from almost nothing in 2009 to 74% of total value in 2011. Until the introduction of the Green Cleaning Program, eco-label or certified environmental management system compliance was not a criterion in tender documents, but now it is a key prerequisite in procurement.

The Green Cleaning Program still continues in Reykjavík. After four years a new procurement round was organized in 2013. At that time there were significantly more companies with both the Nordic Swan eco-label and certified environmental management system at the market, hence the environmental criteria were included in technical criteria, leaving price the only award criterion.

Cost-effectiveness

The costs of this program included consultant fees for experts participating in the needs analyses and working hours for the interdepartmental teams that participated in the tender process. Both fell within normal operations and the program did not receive any external funding. The financial gains of the program were extensive and considerably exceeded the costs in financial terms. The cleaning costs were lowered by 50% in both tenders – a total annual saving of EUR 539,700.

Challenges and potential for further development

Awarding points to environmental management had not been done before in Reykjavik's public procurement practice for cleaning services and some bidders complained that the notice given was too short. However, by setting environmental management as an award criterion, not as a technical specification, flexibility was given. Given the market expansion, it may be possible to include the more ambitious criteria as part of the technical specifications in future tenders.

Reviewing the contractor's environmental performance should be included in contracts. Regular meetings with the contractor are not sufficient to review environmental performance. However, having a certified environmental management system or an eco-label ensures regular external control and a good environmental and quality performance.

10. Norway

10.1 Renewable Heating Systems for Schools

Figure 8: Safe playground for future decision makers: School Yard, Uranienborg, Oslo



© 2010 Undervisningsbygg Oslo KF.

Case Description *

- *Country:* Norway (Region: Europe).
- *Geographic scope:* National.
- *Theme:* Sustainable Public Procurement.
- *Type of Initiative:* Public and private investments.
- *Lead actor:* Undervisningsbygg Oslo KF.
- *Type of lead organization:* Government.

Budget

Approximately EUR 11.2 million.

Partners

Confederation of Norwegian Business, the National Program for Supplier Development and Oslo Renewable Energy & Environment Cluster.

Status

Starting date 1/1/2010, Ended 31/12/2013.

Next steps

Due to a rapidly expanding population, Oslo schools are now being extended and built at an unprecedented rate. There are construction investments planned to take place annually until the year 2017, which are in total 2,000-3,000 million NOK per year. The need for renewable heating must be addressed in all of these buildings.

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

10.1.1 Introduction

The City of Oslo, Norway, sought to equip all schools in the area with renewable energy based heating systems by the end of 2011. An improvement in existing technical and operational performance was also a major requirement of the procurement, along with improved environmental performance and value for money. To find a more innovative and effective approach, the City of Oslo decided to establish a Partnership with three development actors and use a multistage procurement procedure starting with market dialogue and a pre-commercial contest followed by a development phase. These phases produced innovative solutions, which were brought to final tenders and then purchased.

10.1.2 Objectives

The aim of the procurement procedure was to replace existing fossil fuel furnaces in schools with reliable and renewable heating systems. Environmental considerations were central to each stage of the process. An improvement in existing technical and operational performance was also a major requirement of the procurement, along with improved environmental performance and value for money.

10.1.3 Activities

Before the procurement procedure started, 52 out of 177 schools in Oslo used fossil fuels as the primary fuel for heating. The City of Oslo wanted to replace the heating systems of these 52 schools with renewable energy based systems. A Partnership was established between the Confederation of Norwegian Business, the National Program for Supplier Development and Oslo Renewable Energy & Environment Cluster, in order to find a more innovative and effective approach to purchasing renewable heating systems. A 4-stage procedure was chosen; consultation and dialogue with the market, a pre-commercial competition for innovative solutions, a development phase, and the final tenders, where solutions identified from the 3 earlier steps were purchased.

Procurement criteria:

- Technical criteria:
 - No fossil fuels should be used as an energy source. Electric space heating should not be used.
 - Award criteria used in the early stage pre-commercial contest for new and innovative ideas.
 - Competitiveness from a life cycle perspective, including investment costs, cost of management, operation and maintenance and lifespan.
 - Reliability of the system.
 - Degree of innovation.
 - Positive gains for the environment.
 - Ease of implementation.
 - Replication potential in schools and other buildings.

10.1.4 Success factors

Throughout the procurement process, the City of Oslo successfully involved all relevant groups of academic, professional and commercial stakeholders, as well as Council leaders and maintenance technicians at the schools. A sufficient amount of time was allocated for this consultation, which allowed detailed and fruitful dialogue, and helped to ensure an open and comprehensive procurement process. Approval from Council Leaders at the highest level was important for changing current practice within the organisation. The City Council gained access to technical solutions unlikely to have arisen from an ordinary purchasing process with no pre-commercial activities. Early dialogue was crucial to creating these new, innovative ideas, as was the use of competitions. Workshops organised by the industry itself made way for new and productive cooperation between suppliers.

10.1.5 Key Results and Achievements

As part of the competition 12 proposals were put forward and 4 were awarded. Several of these proposals were made by consortia as opposed to individual organizations.

Novelty

Ideas from the competition and outputs from the subsequent development projects were implemented in many heating systems during 2010 and 2011. Some of the technologies include ground solar heat collectors, geothermal heat pumps and air-to-liquid heat pumps. Also bio-oil, biogas, solid biofuel, and various combinations of these are now used instead of fossil fuels in Oslo's schools. There were between 3 and 7 bids for each separate tender. The City Council successfully met the aim of phasing out these 52 non-renewable systems before the end of 2011. The heating systems developed during this procurement process have been considered along with other systems in later constructions. Improved competence within the region's renewable heating industry was achieved as a consequence of this series of procurement procedures, as were the skills and knowledge of the Municipality.

Sustainability impacts

Burning fossil fuels generates greenhouse gas emissions and has negative effects on human health, biodiversity and water quality. Replacing fossil fuel furnaces in schools with renewable heating systems mitigates the negative environmental effects of fossil fuel extraction and combustion.

An annual reduction of approximately 3,000 tonnes CO₂ has been achieved as a result of this project. In 2010, 5.4 tonnes of CO₂ was produced from fossil fuels, which decreased to zero by 2014. Air pollution from other emissions, including carbon monoxide (CO), nitrogen oxides (NO_x), sulphur oxides and dust have also been reduced.

Cost-effectiveness

The change of heating systems in schools has been one part of an extensive plan to reduce environmental impacts in the City of Oslo. The whole plan has been quite profitable, but it is not possible to calculate effects of this measure alone.

Challenges and potential for further development

The main challenge successfully overcome by Oslo was to maintain and implement the experience and knowledge gained through market dialogue, the competition stage and the project development phase, in a way that did not exclude competition and respected the principle of non-discrimination.

10.2 Technology-Neutral Procurement of a Full-Electric Ferry

Case Description *

- *Country:* Norway (Region: Europe).
- *Geographic scope:* Regional.
- *Theme:* Sustainable Public Procurement.
- *Type of Initiative:* Public and private investments.
- *Lead actor:* The Norwegian Directorate of Public Roads opted.
- *Type of lead organization:* Government.

Budget

The procurement of a more environment-friendly ferry was allowed to cost up to EUR 5.5 million more than a normal ferry, excluding the award for losing bids.

Status

Starting date 1/1/2010. Ended 1/1/2015.

Next steps

In approving the National Budget for 2015, the Norwegian Parliament adopted the following decision: “The Government is requested by the Parliament, to ensure that requirements for zero-emission technology (and low-emission technology) are included in all future tenders for public ferries, when the technology allows for it.”

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

10.2.1 Introduction

A full-electric ferry was procured by the Norwegian Directorate of Public Roads to operate between Lavik and Oppedal. The technology-neutral procurement process was carried out in two phases, i.e. pre-qualifying bidders before entering into the competitive dialogue phase. The Directorate established an advisory group while developing the tender documentation and the evaluation criteria, in order to both involve the end-users and assess the technological need.

The winning shipping company worked with a Norwegian shipyard and a large engineering and electronics company, who co-developed this new ship as the world's first electrically-powered car ferry. The first phase of the procurement process was launched in 2010 and the ferry started operating in 2015.

10.2.2 Objectives

To develop a new ferry that is 15–20% more energy efficient than the diesel ferry that was then in operation.

10.2.3 Activities

The Norwegian Directorate of Public Roads opted to use a competitive dialogue in order to explore innovative solutions with prospective ferry operators. This was carried out as part of a two stage procurement process.

cedure, i.e. pre-qualifying bidders before entering into the competitive dialogue phase. The Directorate established an advisory group while developing the tender documentation and the evaluation criterion, in order to involve the end-users and assess the technological need. In order to develop a solution, ferry operators bid for the tender while working in Partnership with both engineering firms and ship building yards. The Directorate published the first stage of a two stage tender procedure in 2010. The tender refrained from requiring a specific technology. The ferry started operating in 2015 and is currently in full operation.

Procurement criteria:

- *Technical criteria:* The tender specifications required a ferry with a capacity for 120 cars and 360 passengers, without prescribing a certain technology. “Energy efficiency” was specified in terms of low fuel consumption and “low environmental impact” was specified in terms of reduced emissions as a result of a selected energy carrier or technical solution.
- *Award criteria:* The Norwegian Directorate of Public Roads developed an evaluation model with 6 evaluation criteria. The criteria and their respective weightings were as follows: Price: 60% Quality 40%, broken down into: kWh/PCU*km (18%) MJ/year (6%) ton CO₂ /year (6%) kg NO_x/year (4%) Innovation (6%). (*PCU = Passenger Car Units).
- *Contract performance clauses:* As part of their final offer each bidder proposed their design of the ferry as well as performance data in relation to the environmental aspects of the ferry. If during the execution of the contract the ferry should underperform on any of these aspects, the winning bidder will incur financial penalties.

10.2.4 Success factors

This tender demonstrated to the Norwegian Directorate of Public Roads that electric vehicles can come out on top in technology neutral tenders if the right technical specifications and award criteria are used.

The Norwegian Directorate of Public Roads has used the competitive dialogue procedure in previous tenders and the experience indicates that the decision on whether to use competitive dialogue is very much dependent on the complexity of the procurement.

10.2.5 Key Results and Achievements

Four transport (ferry) operators participated in this tender. Each operator entered into a consortium together with a ship builder, technology developer and/or engineering company. The 3 unsuccessful bidders were compensated for the time and resources spent on the bid.

Novelty

The winning shipping company worked with a Norwegian shipyard and a large engineering and electronics company, who co-developed this new ship as the world's first electrically-powered car ferry. The engineering and electronics company developed everything from the battery to the propulsion, and the shipping yard developed the body of the ship. The port batteries will recharge the ferry's battery during the 10-minutes breaks between crossings and will be slowly recharged from the local grid, while the ferry is sailing between the ports. The design of the ferry also lends to further energy savings: the characteristics of the ferry result in the new vessel weighing half of that of a similar, conventionally designed ferry. Whereas the ferry currently serving the route has an engine with an output of 1,500 kW or more than 2,000 horsepower, the battery in the new ferry has an output of 800 kW. In normal conditions, operating at a speed of 10 knots, a battery power of 400 kW is sufficient.

Sustainability impacts

A 10-year contract was awarded to the winning bidder, due to the fact that the investment in developing a new ferry is so high, and that a shorter term contract would have not been attractive to a bidder. The Directorate aimed for a minimum of a 15–20% improvement of energy efficiency and environmental impact of this ferry in comparison to the previous conventional diesel ferry, which was procured and delivered in 2010. The resulting improvements are as follows:

- kWh/PCUkm: 37% reduction.
- MJ/year: 60% reduction.
- ton CO₂ /year: 89% reduction.
- kg NO_x/year: 100% reduction.

Cost-effectiveness

The cost of this vessel was more expensive than a typical reference vessel. However, fuel cost per km is 70% lower than for conventional diesel-electric ferries (3.1 EUR/km for battery ferry compared to 10 EUR/km for a conventional diesel-electric ferry). It is important to notice that the fuel cost of this ferry is only 8% of OPEX (operational expenditure) and 4% of the total vessel cost for the battery driven ferry, while fuel cost for a conventional diesel-electric ferries is approximately 20–25% of OPEX, which constitutes 15% of the total vessel cost.

11. Sweden

11.1 Joint National Procurement of Electrical Vehicles

Figure 9: The Cleans Vehicles and Fuels team at the City of Stockholm, Sweden together with their shared electric car



© Lennart Johansson, City of Stockholm.

Case Description *

- *Country:* Sweden (Region: Europe).
- *Geographic scope:* National.
- *Theme:* Sustainable Public Procurement.
- *Type of Initiative:* Public and private investments.
- *Lead actors:* City of Stockholm and Vattenfall AB.
- *Type of lead organization:* Government.

Partners

Swedish Energy Agency.

Status

Starting date 1/10/2010. Ending date 30/9/2015.

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* Note: Case descriptions, e.g. with regards to theme, type of initiative, actor, organisation and/or partner, follow the groupings used within the UNEP Clearinghouse.

11.1.1 Introduction

In October 2010, public and private entities in Sweden joined forces to conduct a national procurement of Electric Vehicles (EVs) and Plugin Hybrid Electric Vehicles (PHEVs). This was a joint project between the City of Stockholm and Vattenfall AB. A public procurement process of EVs and PHEVs, both passenger cars and light trucks, was carried out in 2010–2011. An invitation to participate in a national procurement was issued in 2010 and the interested parties worked together to define parameters for bidder qualification and the tender process. Renewed competition tendering, introduced after a change in legislation, is a new method not previously used in procurement agreements for vehicles. Minimum targets included: the participation of 150 buying organisations, a total demand for 5,000 vehicles and offers from 8 manufacturers. A two-year framework agreement was signed with six vehicle suppliers starting on 1 October 2011. Beside procurement the project had also other objectives: to increase the interest in EVs and introduce them to the Swedish market, collect data of their operation in different Swedish organisations and spread information.

11.1.2 Objectives

The principle objectives of the joint procurement were to take the country's first significant step towards creating a demand for electric vehicles and to demonstrate Sweden's market potential to manufacturers. Another aim, aside from contributing towards quieter and cleaner fleets, was to optimise available deals on purchasing EVs or PHEVs. The minimum targets set included: the participation of 150 buying organizations, total demand for 5,000 vehicles and offers from 8 manufacturers.

11.1.3 Activities

In October 2010, public and private entities in Sweden joined forces to conduct a national procurement of Electric Vehicles (EVs) and Plugin Hybrid Electric Vehicles (PHEVs). An invitation to participate was issued and interested parties worked together to define parameters for bidder qualification and the tender process. The first qualification stage meant that approved suppliers could let their European offices know in good time that there was an opening for supplying EVs to a large number of customers in Sweden. Renewed competition tendering was a new procurement method and it had to be carried out under the framework contract for public authorities before orders could be placed.

Two contracts for the purchase/lease of electric vehicles were signed and commenced in October 2011. Each contract is for a two year period, with the option to extend to up to 4 years. The reason two separate contracts were used was to accommodate the different entities joining the procurement i) Electric vehicles 2011: Public bodies and ii) Electric vehicles 2011: Private organisations.

Procurement criteria included technical criteria, award criteria and contract performance clauses:

- Technical criteria:
 - For passenger cars: Electric vehicles should have an all-electric range of over 100 km and the energy consumption should be 0.37 kWh/km or below. Plugin hybrid electric vehicles should have all-electric range of over 20 km and CO₂ emissions of maximum 50 g CO₂/km. Both vehicles should be able to be charged using a Schuko socket in one phase, 230V/10A, their top speed should exceed 100 km/h and their maximum cost should be SEK 400,000–650,000 (EUR 48,000–78,000).
 - For transport vehicles: Electric vehicles should have all-electric range of over 100 km and plugin hybrid electric vehicles over 20 km. Both types of vehicles should be able to be charged using a Schuko socket in one phase, 230V/10A, their top speed should exceed 90 km/h and their maximum cost should be SEK 600,000–800,000 (EUR 72,000–96,000).

- Award criteria:
 - Euro NCAP³ scores or similar for both passenger cars and transport vehicles.
 - Total >32.5/28 p.
 - Pedestrians >9.5 p.
 - Whiplash protection >2 p.
 - Electronic Stability Control (ESC).
 - Possibility to install alcohol lock.
- Contract performance clauses:
 - Prior to the start of the contract, a risk assessment was conducted which highlighted priority environmental aspects associated with electric vehicles, including the use of metals like cobalt and lithium, as well as nano products. Due to the immature nature of the market, it was decided these issues would be explored more fully a year into the contract. The idea was that at this stage manufacturers may have to propose improved methods for dealing with these materials. Although manufacturers of cars and batteries are required by law to take their products back and dispose of them in an environmentally responsible manner, these aspects are also monitored in practice by the contracting authorities throughout the lifetime of the contract.

11.1.4 Success factors

The joint procurement proved to be successful in terms of creating a good scale of demand and saving individual partners time and money, especially smaller stakeholders. The two-step procurement procedure with a prequalification stage for bidders drew attention to the procurement from both national and international vehicle retailers.

11.1.5 Key Results and Achievements

The invitation to participate in the procurement attracted 296 organizations; 260 public and 36 private entities. Together the stated intent was to buy 1,250 vehicles per year, corresponding to 5,000 vehicles in total over the possible four year contract period. 12 manufacturers out of 14

³ European New Car Assessment Programme.

qualified, 10 of these submitted tenders and 6 were successful. 2 were disqualified as the top speed specified was not met and another 2 because they did not provide information about service costs.

A framework contract was entered into with 4 suppliers, for the provision of a total of 9 vehicle models. The contracts began in October 2011. Qualified suppliers had to accept orders by 1 October 2012 at the latest. Initially 400 call-off orders from public and private organisations were placed, but the number decreased to just over 300 during the final year. In total, more than 850 vehicles were ordered from the framework agreement (November 2014). Along with the 50 EVs from the test fleet, the procurement has contributed to the use of more than 900 plug-in vehicles in Sweden.

Novelty

The main objective of the procurement was achieved; potential suppliers of electric vehicles are now aware of Sweden's interest, its well-developed charging outlet infrastructure and the country's relatively clean and cheap electricity supply.

Renewed competition tendering, introduced after a change in legislation, was a new method not previously used in vehicle agreements. Initially, many of those making call-off orders worried that the procedure would be cumbersome and complicated. However, invaluable support, written and verbal, from SKL Kommentus (a procurement and business support provider) was available from the start. Once the renewed competition process was tried, it was found to be quite easy to manage.

Sustainability Impacts

90% of electricity in Sweden is generated through hydro- or nuclear power, causing much lower GHG emissions than electricity generated through the combustion of fossil fuels. Demonstrating this principle, calculations in this case indicate that for every 100,000 km, the electric fleet would cause just over 1.3 t CO₂ to be emitted, compared to over 13.8 t from an equivalent petrol fleet.

Calculations conducted with assistance from the Royal Institute of Technology indicated that between January and June 2012, the vehicles purchased covered 55,403 km in total, which caused the equivalent of 0.73 t/CO₂ to be emitted (Nordic energy mix = 66g of CO₂ are emitted per KW/h). Compared to an equivalent petrol car, which would have emitted 7.65 t/CO₂, it works out as a saving of almost 7 tonnes of CO₂ over 6 months. Until October 2014, the assessed cars had driven 2.7 million kilometres and avoided carbon dioxide emissions by 325 tonnes.

Regarding problematic substances e.g. cobalt, lithium and nanoparticles, a risk analysis was made and discussion with the manufacturers was opened. Manufacturers are aware of the issues related to electric cars, but there are no clear practices to deal with the substances yet.

Cost-effectiveness

Maximum prices quoted for passenger cars ranged from the equivalent of just over EUR 26,000 to under EUR 40,000 and for transport vehicles from around EUR 24,000 to EUR 39,000. One bidder offered a 3% rebate for the consortium compared to the regular price and another offered lower prices but charged a monthly fee for leasing the battery.

Challenges and potential for further development

Reaching an agreement on vehicle specifications was time-consuming and challenging due to the number of stakeholders involved and concerns over vehicle safety.

The EV procurement received many incorrect tenders which could not be approved, due to ignorance and carelessness among the tendering suppliers. To facilitate bidding, the basic documentation could have been even clearer and simpler. Price caps could have been included and explained, not only for vehicles but also for services. We believe that some additional suppliers could have submitted tenders if they had understood the significance of maximum price.

The advisory reference group was very clear that they wanted vehicles with maximum speeds of 90–100 km/h. The original proposal from the requirement specification group of 70 km/h for light trucks was rejected. Rather than increasing the maximum speed to 90 km/h for light trucks, speed requirements could have been specified at call-off. In such case, both IVECO and Mercedes could have been accepted for deliveries of their vehicles with maximum speeds of 70 and 80 km/h respectively, for buyers looking for slightly larger electric transport vehicles, and willing to accept lower maximum speeds.

Safety criteria were widely discussed within the EV procurement and also externally, e.g. in the media. At the time of the procurement, no EVs had been tested in Euro NCAP or equivalent testing agencies. In other words, it was too early to specify safety requirements. In order to include these, the procurement would have had to be postponed for at least six months. Some of the vehicles in the EV procurement did not have the highest safety rating or anti-skid braking systems, and organisations refrained from buying these.

The market for EVs is very immature and in general, demand is larger than supply. This made it hard to get lower prices or discounts in the joint procurement.

Next steps

The framework contract for procurement of electric cars is valid until the end of September 2015 and support and help with contracts is provided by the project. Data for the demonstration part of the project is being collected and analysis of data will take place in the end of 2015. Procurement of electric vehicles will continue and from now on EVs will be included in the regular procurement of vehicles.

Sweden can become a world-leading nation within the area of plug-in vehicles through collaboration and coordination. The responsibility lies with all parties. The government has a major role to play in establishing clear long-term principles, and at the same time avoiding separate national solutions. Municipalities are responsible for a number of important control instruments: parking, traffic lanes, environmental zones and a large proportion of the charging infrastructure. It is considered crucial that companies review their vehicle usage and start replacing conventional vehicles with plug-in models. The car industry needs to work with product development and standardisation. Demonstrations and information are important activities. Individuals should consider their own needs of personal transport.

An obvious focus, especially in towns, is to encourage more fleets to acquire plug-in vehicles. Fleet vehicles are often used for specific purposes, and cannot be replaced by public transport. As they are often used for short distances during day-time, EVs are perfect. Plug-in vehicles are an important component towards fossil fuel independence, but must be combined with other measures. Public transport, walking and cycling all contribute to improved personal mobility. Smart logistics are important for freight transports. Unfortunately, traffic problems cannot be resolved just by a transition to plug-in vehicles, although they constitute a vital part in the fossil-free vehicle fleet.

Sammanfattning

De nordiska länderna arbetar aktivt på både nationella och internationella fora för att befrämja ekonomisk utveckling i enlighet med hållbar exploatering av naturresurser. Den här rapporten presenterar ett antal nordiska initiativ och projekt för att konkret och aktivt befrämja hållbar konsumtion och produktion (SCP). Rapporten har som målsättning att beskriva och dela med sig framgångsrika nordiska erfarenheter och lärdomar.

Initiativen som presenteras i rapporten omfattar två särskilda teman, dvs Hållbar livsstil och utbildning samt Hållbar offentlig upphandling. Dessa identifierades tillsammans med Nordiska ministerrådets Arbetsgrupp för hållbar konsumtion och produktion. Initiativen som presenteras valdes från ett brett utbud av nordiska projekt och har som mål att sprida lärdomar om effektiva, framgångsrika och hållbara sätt att befrämja SCP. De är sammanställda och presenterade på ett sätt som underlättar en jämförelse av centrala resultat och kriterier för framgång, och kan hjälpa i spridning och replikering av goda SCP lösningar. Beskrivningarna av initiativen bygger på material som varit tillgänglig för konsulten, inkluderande dokumentation samt intervjuer med representanter för de respektive initiativen. Validering av hur komplett de olika initiativen beskrivna eller korrekt det använda data har varit var inte en del av uppgiften för denna rapport.

De elva initiativen inom temat Hållbar livsstil och utbildning omfattar olika projekt och program som har utformats för att vägleda människor mot ett mer hållbart sätt att leva. Målgrupperna i de olika exemplen sträcker sig från dagvård och förskolor, skolbarn, kontorsarbetare och startup företag till invånarna i städer och vissa fall har som målgrupp hela befolkningen på nationell nivå. Temat Hållbar offentlig upphandling omfattar åtta initiativ där en offentlig upphandlare – t.ex. en stad, en region eller ett land – är i huvudrollen. Exemplet som valts omfattar bland annat en lokal modell för cirkulär ekonomi, ett rikstäckande nät för kunskapsutbyte, samt initiativ där offentliga upphandlingar har varit avgörande för att skapa efterfrågan på mer hållbara energi-, trafik- och rengöringslösningar.

I linje med det övergripande målet för det här nordiska projektet Nordic Best practices, har initiativen även lagts in i den så kallade SCP Clearinghouse⁴ webbportalen, som fungerar som informationsplattform för UNEP:s 10 års ramprogram för hållbar produktion och konsumtion. Ramprogrammet för FN:s miljöprogram UNEP gällande hållbar produktion och konsumtion (10YFP) är ett konkret resultat av Rio+20 och dess syfte är att stärka det internationella samarbetet för att accelerera en övergång till mer hållbar konsumtion och produktion i både utvecklade och utvecklingsländer. SCP Clearinghouse är ett webbaserat verktyg för informationsutbyte som kan användas av olika aktörer för att få inspiration om olika sätt att befrämja mer hållbar konsumtion och produktion överallt i världen. SCP Clearinghouse ger också tillgång till ytterligare material och länkar till mer omfattande information om de nitton initiativ som presenteras här i rapporten.

⁴ <http://www.scpclearinghouse.org/>

Appendix 1:

SCP Themes and Sectors in UNEP's SCP Clearinghouse⁵

- 10YFP Sustainable Lifestyles & Education Programme
- SPP and Ecolabelling
- Sustainable Food Systems
- Lifecycle perspective
- SCP policy and economic framework.
- SCP knowledge base.
- Sustainable urban development and cities.
- Sustainable rural development.
- SCP, Poverty reduction and Sustainable Livelihoods.
- Sustainable Lifestyles and Consumption.
- Sustainable Production and value chains.
- Sustainable Public Procurement.
- Awareness-raising and Education for SCP.
- Agri-food.
- Buildings and construction.
- Chemicals.
- Energy.
- Fair trade.
- Finance and insurance.
- Health and social services.
- Media, advertizing and marketing.
- Management and human resources.
- Manufacturing.
- Mining and metals.

⁵ <http://www.scpclearinghouse.org/>

- Retailing.
- Tourism.
- Transports and Mobility.
- Waste.
- Water.

Appendix 2:

Types of Initiative in UNEP's SCP Clearinghouse⁶

- Policy frameworks and processes.
E.g. International agreements, bilateral agreements, strategic planning, action plans, enhancement of existing policies, new institutions/entities.
- Regulatory instruments and legal reforms.
E.g. Laws, standards, enforcement measures.
- Economic and financial instruments.
E.g. Taxes and tax incentives, grants, preferential loans.
- Public and private investments.
E.g. investment programmes, procurement programmes.
- Capacity-building and technology transfer.
E.g. Advisory services, trainings, best practices sharing, guidelines, toolkits, manuals.
- Analysis and assessment.
E.g. Policy opportunity and impact assessments, collection of SCP case studies, data collection, SCP indicators, assessment methodologies (e.g. lifecycle assessment).
- Research and development.
E.g. Research programmes, technology development.
- Partnerships and voluntary agreements.
E.g. Multi-stakeholder Partnerships, sectoral Partnerships, codes of conduct, CRS initiatives.

⁶ <http://www.scpclearinghouse.org/>

- Production and value-chain management.
E.g. Integrated product policy, product/service design, production processes.
- Information, awareness-raising, education.
E.g. Consumer information, eco-labels and certification, formal/non formal education, public/media campaigns.

Appendix 3:

SCP Communities in UNEP's SCP Clearinghouse⁷

- Sustainable Buildings and Construction.
- Energy Efficiency.
- Sustainable Lifestyles and Education.
- Consumer Information.
- Sustainable Food Systems.
- Sustainable Public Procurement.
- Sustainable and Safer Production.
- Sustainable Tourism.
- Scientific Knowledge.
- SCP National Policy frameworks/strategies.
- SCP Africa.
- SCP Asia and the Pacific.
- SCP Europe.
- SCP Latin America and the Caribbean.
- SCP West Asia.
- SCP Mediterranean.

⁷ <http://www.scpclearinghouse.org/>



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Nordic best practices

The working group on Sustainable Consumption and Production, under the Nordic Council of Ministers requested consultants from Gaia to identify, write out and publish best practice cases of sustainable consumption and production on the UNEP SCP Clearinghouse. This report presents nineteen initiatives that cover two particular themes:

1. Sustainable Lifestyles and Education and
2. Sustainable Public Procurement.

The cases have also been added into the UNEP's 10 Year Frame-work Program (10YFP) information platform, the SCP Clearinghouse which is a concrete result of Rio+20. The objective is to enhance international cooperation in order to accelerate a shift towards sustainable consumption and production in developed and developing countries. The SCP Clearinghouse is a web-based information sharing tool, which can be used by different actors as an inspiration for advancing SCP worldwide.

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