

Workshop on green business models in the Nordic region 'September 3<sup>rd</sup>  
2010

## **Preliminary findings and questions for discussion - 'Green Business Models in the Nordic Region'**

### **Introduction**

The Danish Presidency of the Nordic Council of Ministers and the Danish Enterprise and Construction Authority has undertaken the project 'Green Business Models in the Nordic Region', because Green growth and green business models is highly prioritized by the presidency.

The purpose of this short paper is to give a short presentation of the findings of the project and provide a basis for a discussion for the workshop. The paper sums up the main conclusions from five expert interviews and 22 case interviews. The identified economic and environmental benefits, barriers and drivers as well as recommendations are thus statements reported from the case studies and expert interviews.

For each of the models, the basic concept and the economical and environmental benefits are described. Common characteristics in the cases are described in relation to the barriers and drivers, and concrete recommendations for disseminating the business models in the Nordic region are listed.

Compared to more 'classic' business models, green business models are characterised by business models focusing on innovative business strategies and *relations* between businesses respectively businesses and customers reducing energy consumption, greenhouse gas emissions, resource use and/or waste thus creating economic benefits. In this project the working definition is, c.f. 'the delimitation of the scope of the project':

*"Green business models are business models which support the development of products and services (systems) with environmental benefits and reduce resource use/waste and are economic viable. These business models have a lower environmental impact than traditional business models."*

The five models investigated in the project are: Energy Saving Companies (ESCOs), Chemical Management Systems (CMS), Design, Build, Finance, Operate (DBFO), Sharing and other Product Service Systems

### **DANISH ENTERPRISE AND CONSTRUCTION AUTHORITY**

Dahlerups Pakhus

Langelinie Allé 17

DK-2100 Copenhagen

Denmark

Tel. +45 35 46 60 00

Fax +45 35 46 60 01

CVR-no. 48 46 41 14

ebst@ebst.dk

www.ebst.dk

(Other PSS). The interviewed experts and case companies are listed in table 1.

**Table 1: Interviewed experts and case companies**

ESCOs	DBFO	CMS	Sharing	other PSS
<ul style="list-style-type: none"> <li>• <i>Magnus Enell</i> (expert)</li> <li>• Schneider Electric (Sweden)</li> <li>• Danfoss (Denmark)</li> <li>• Dalkia (Sweden)</li> <li>• Enespa (Finland)</li> <li>• Thyssen Krupp (Denmark)</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Markku Antonnen</i> (expert)</li> <li>• Allfarveg E39 (Norway)</li> <li>• Kaivomestira (Finland)</li> <li>• Watrec (Finland)</li> <li>• AFA JCDecaux (Denmark)</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Ole Helby</i> (expert)</li> <li>• Kemira (Finland)</li> <li>• Argentum (Sweden)</li> <li>• AGA Gas (Sweden)</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Oksana Mont</i> (expert)</li> <li>• Bilkollektivet (Denmark)</li> <li>• Move About (Norway)</li> <li>• Kuinoma (Finland)</li> <li>• GreenQloud (Iceland)</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Matthias Lindahl</i> (expert)</li> <li>• Volvo Aero (Sweden)</li> <li>• Better Place (Denmark)</li> <li>• Malvik Everk (Norway)</li> <li>• PSS Energy (Denmark)</li> <li>• Preseco (Finland)</li> <li>• ICEconsult (Iceland)</li> </ul>

A minor snowball analysis has been performed to identify companies in the Nordic region working with the specific business models. This snowball analysis showed that the dissemination of these business models varies from country to country and that these business models in general are not widespread in the Nordic Region. The grouping of the different types of business models and whether every one of the cases could indeed be characterised as this particular type of business model is debatable. Nevertheless, we have chosen for the workshop to present all of the cases and grouped in this way.

The results from the interviewed experts and case companies will be discussed and ‘qualified’ on the workshop in Copenhagen, September 3<sup>rd</sup> 2010. The outcome of the workshop will together with the desk research in the project, expert interviews and company cases serve as input to a green paper presented for the Nordic ministers at a Nordic Council of Minister’s meeting in October and published shortly hereafter.

In the following, each of the five green business models is presented very shortly in terms of concept, the economical and environmental benefits, as well as barriers, drivers and concrete recommendations stated by the experts and case companies (for the group discussions at the workshop a more complete list of the interview statements will be given as well as the general desk study findings). At the end of each model a set of questions are posed which will serve as a starting point for the discussions at the workshop. Further details about the models, expert interviews and cases can be found in the working paper respectively in the expert interviews and case interview reports.

## **Table of contents**

Energy Saving Companies (ESCOs)	4
Design, Build, Finance, Operate (DBFO)	8
Chemical Management Systems (CMS)	11
Sharing	15
Other Product Service Systems (PSS)	19

## Energy Saving Companies (ESCOs)

### What is ESCO?

An ESCO is a company that develops, installs and finances (can assume some of the financial risk) performance-based heating, energy or other supply projects of facilities owned by customers (e.g. a school). The ESCO is paid according to the extent of realized heating, energy or supply savings.

### Project findings

#### Economical benefits

- The ESCO expert interviewed reports of a case where the savings during 2008-2009 have been 25-35 %.
- In general, energy is saved, maintenance costs are reduced, and the product lifetime is prolonged.
- The five ESCO case companies have saved between 12-25 % in energy consumption with a return of investment period from 1½ up to 15 years.
- Although the business model has existed for many years, innovations and new technical solutions are invented along with the implementation of the different projects.
- Indoor climate is often improved.
- The companies expect a future economic potential in this business model.

	Very low extent	Low extent	High extent	Very high extent	I do not know
<b>The extend to which the companies believe that there is a potential for more similar projects/cases in their own country</b>	0	0	1	4 (1)	0
<b>The extend to which the companies believe that there is a potential for more similar projects/cases in other Nordic countries</b>	0	0	1	3 (1)	1

Note: The '(...)' denotes the experts answer.

#### Environmental benefits

- The ESCO companies generally reduce energy consumption and thereby CO<sub>2</sub>, NO<sub>2</sub> and NO<sub>x</sub> emissions for their customers.
- One of the companies report that 30-40 % of the monetary savings are related to the replacement of oil.
- Product lifetime is prolonged.

<b>The extend to which companies believe that there is a positive environmental potential affiliated with their respective model</b>	Very low potential	Low potential	High potential	Very high potential	I do not know
	0	0	2,5	2,5 (1)	0

Note: The '(...)' denotes the experts answer.

The extend to which the companies believe their business model to bring about environmental benefits compared to more traditional business models	Very low extent	Low extent	Same	High extent	Very high extent
	0	0	0	3	2 (1)

Note: The '(...)' denotes the experts answer.

### Barriers

- In general, customers are lacking knowledge about the economic benefits by implementing ESCO models.
- Inexperienced consultants lacking knowledge of ESCOs are a problem for the dissemination of the model.
- Energy savings provided by ESCO companies are hard to see and thereby less tangible and less attractive to end-users in many cases.
- Uncertainty on the public market for public procurement for energy service.
- Hindering regulation.

The company's rating of barriers for the business model (1: least important barrier, 10: most important barrier)	Supplier's point of view	Customer's point of view
Regulation	4,1 (5)	2,4 (8)
Lacking will	3,0 (1)	5,2 (1)
Lacking abilities	3,3 (5)	4,6 (3)
Lacking knowledge	3,8 (4)	5,0 (2)
Lacking finance	3,8 (3)	7,0 (1)
Unclear economic benefits	2,8 (1)	3,2 (1)
Unclear environmental benefits	1,4 (2)	1,8 (2)
Other uncertain advantages	3,5* (-)	4,5* (-)
Other barriers?	6,0* (8)	4,3* (8)

Note: The '(...)' denotes the experts answer. '-' denotes no answer was given.

Note: \*= only 2-3 respondents, \*\* = only 1 respondent

The extend to which companies believe that there are barriers for the dissemination of the model	To a very low extent	To a low extent	To a high extent	To a very high extent	I do not know
	1	0	3 (1)	1	0

Note: The '(...)' denotes the experts answer.

### Drivers

- It is important for the ESCO providers to make a business and important for the customers to save energy (cost saving). The customers also see a great branding value in saving energy.
- Regulation and political incentives to save energy and reduce CO2 emissions are very important drivers for the ESCO providers and their customers.
- Rising energy prices.

<b>Average perceived importance of barriers from the company's point of view (1: least important barrier, 10: most important barrier)</b>	<b>Supplier's point of view</b>	<b>Customer's point of view</b>
<b>Branding/reputation</b>	5,8 (9)	6,6 (5)
<b>Earnings</b>	7,2 (10)	6,5* (9)
<b>Savings</b>	4,0** (8)	7,0 (9)
<b>Positive environmental effects</b>	5,8 (8)	7,1 (8)
<b>Financial support from government</b>	4,2 (8)	4,4 (8)
<b>Regulation</b>	4,2* (5)	3,4* (3)
<b>Other framework conditions</b>	10,0* (-)	10,0* (-)
<b>Other drivers?</b>	- (-)	8,0** (-)

Note: The '(...)' denotes the experts answer. '-' denotes no answer was given.

Note: \*= only 2-3 respondents, \*\* = only 1 respondent

## **Recommendations**

- Promoting and advertising of ESCO models for instance by encouraging demo-projects.
- Marketing, marketing, marketing.
- Set up financial support for ESCO projects, environmental loans or energy saving investments in general.
- Rebate on CO2 taxes.
- Enforce law and regulations, as well as initiatives to use better environmental solutions.
- Standardize ESCO projects. This will remove uncertainties for the customers.
- Set up demands for energy savings in the industry. For instance by making it mandatory for companies to make a yearly analysis of their use of energy and /or to specify an action plan for energy savings the next 5 years.
- Encourage ESCOs in the Nordic region as a strategic goal and position of strength.
- Make the business model a Nordic issue, and more harmonisation and cooperation between the Nordic countries, suppliers and annual estimates about what the business model has gained.
- Make new international accounting rules for credit ratings. Investing in ESCO projects makes the company's credit rating look worse although the return of investment on ESCO is guaranteed. This is maintenance or an investment issue - today an ESCO project is considered as maintenance on existing buildings. A CO2 reduction could be considered an investment.
- Provide financing for ESCO projects.
- A clear rule and explanation for public procurement of energy services - especially the EPC models.

## **Questions**

- How can ESCO models be further disseminated in the Nordic region?
- How can an ESCO specialisation in the Nordic region be encouraged?
- What can the ESCO providers do to expand the market?
- Is there a need for a network of ESCO providers in the Nordic region?
- The US has an industry organisation for ESCO providers. Is that an idea for the Nordic region?

## **Design, Build, Finance, Operate (DBFO)**

### **What is DBFO?**

The DBFO model concerns capital intensive long-term construction projects where private finance, construction, service and/or maintenance are bundled into a long-term contract which allocates risks and responsibilities between the parties. This gives incentives for the contractor to build a building which uses little energy (and other supply functions) and low maintenance costs, since the contractor's returns are linked to performance.

### **Project findings**

#### **Economical benefits**

- It is generally perceived that there is a great potential for saving money when the public authorities include private companies in DBFO projects. It is difficult though to put an actual number on the amount of savings even for the case companies.
- In many of the projects the maintenance is improved and the lifetime of the products, installations or buildings is improved. Moreover the energy costs are often lowered.
- There have been estimations indicating savings in the range of 10-20% can be achieved, however, other estimations indicate that the model is more costly than traditional models.
- projects are kept within budget and completed on time (however not necessarily cheaper).

	<b>Very low extent</b>	<b>Low extent</b>	<b>High extent</b>	<b>Very high extent</b>	<b>I do not know</b>
<b>The extend to which the companies believe that there is a potential for more similar projects/cases in their <u>own country</u></b>	0	1 (1)	0,5	1,5	0
<b>The extend to which the companies believe that there is a potential for more similar projects/cases in <u>other Nordic countries</u></b>	0	1 (1)	0,5	1,5	0

Note: The '(...)' denotes the experts answer.

#### **Environmental benefits**

- The DBFO projects create energy efficient and environmental friendly solutions in different ways. This translates into CO<sub>2</sub>, NO<sub>2</sub> and NO<sub>x</sub> reductions.
- The case companies are applying different solutions like saving energy by using a brighter asphalt color to make less watt power necessary in the street lights, producing green renewable energy by substituting inorganic fertilizer in the fields by organic fertilizers, and using environmentally friendly cleaning products not containing soap or any other chemicals.

The extend to which companies believe that there is a positive environmental potential affiliated with their respective model	Very low potential	Low potential	High potential	Very high potential	I do not know
	0	0 (1)	1	1	0

Note: The '(...)' denotes the experts answer.

The extend to which the companies believe their business model to bring about environmental benefits compared to more traditional business models	Very low extent	Low extent	Same	High extent	Very high extent
	0	0	1,5 (1)	1,5	0

Note: The '(...)' denotes the experts answer.

### Barriers

- Lacking customer knowledge of the DBFO model is a barrier. Most of the companies are working with very new and not well-known models.
- The uncertainties concerning the calculation of risk in the DBFO model is a barrier, since the customers are often relatively risk averse.
- Some companies underline the barriers from culture differences between the public and the private sector for instance the slower decision making process in the public sector.
- Regulation can also be a barrier. One company is regulated by a maximum period limit of their projects, which put pressure on the return of investment and create more uncertainty in the business model.

The company's rating of barriers for the business model (1: least important barrier, 10: most important barrier)	Supplier's point of view	Customer's point of view
Regulation	3,5* (8)	5,5* (8)
Lacking will	4,0* (5)	5,0* (8)
Lacking abilities	4,0* (4)	5,0* (4)
Lacking knowledge	4,0* (4)	5,0* (2)
Lacking finance	2,5* (1)	2,0* (1)
Unclear economic benefits	8,0* (1)	5,0* (8)
Unclear environmental benefits	4,0** (1)	4,0** (1)
Other uncertain advantages	4,0* (5)	4,0* (5)
Other barriers?	1,0** (-)	1,0** (-)

Note: The '(...)' denotes the experts answer. '-' denotes no answer was given.

Note: \*= only 2-3 respondents, \*\* = only 1 respondent

The extend to which companies believe that there are barriers for the dissemination of the model	To a very low extent	To a low extent	To a high extent	To a very high extent	I do not know
	0	0	1 (1)	0	0

Note: The '(...)' denotes the experts answer.

## Drivers

- All case companies agree to that earnings and profit is the main driver. The positive environmental effects also play an important role – both for the supplier and the customers.
- All companies also mention the branding and reputation of working with a green business model as an important driver.
- The customer's use of these models is foremost driven by the savings involved.

Average perceived importance of barriers from the company's point of view (1: least important barrier, 10: most important barrier)	Supplier's point of view	Customer's point of view
Branding/reputation	8,3 (5)	8,5* (5)
Earnings	9,0* (9)	9,5* (1)
Savings	3,5* (1)	5,5* (3)
Positive environmental effects	6,0* (1)	6,0* (1)
Financial support from government	1,0* (7)	8,0** (10)
Regulation	1,5* (1)	3,5* (8)
Other framework conditions	4,5* (5)	4,5* (5)
Other drivers?	- (-)	- (-)

Note: The '(...)' denotes the experts answer. '-' denotes no answer was given.

Note: \*= only 2-3 respondents, \*\* = only 1 respondent

## Recommendations

- More focus on the new role of municipalities in these projects where the municipalities can improve the environments by outsourcing and without owning and operating buildings and environments themselves.
- The public sector should be more open to use the DBFO business model as a supplement to traditional models.
- Better regulation, for instance by introducing green certificates for renewable energy (ex. biogas).

## Questions

- How could DBFO projects be evaluated to clarify the economic and environmental benefits of the projects?
- How could cultural differences between the public and the private sector be overcome in DBFO projects?
- What could providers of DBFO solutions do to promote the models?
- What can the public sector do to be more open-minded towards DBFO solutions?

## Chemical Management Systems (CMS)

### What is CMS?

Chemical management services is a business model in which a customer engages with a service provider (typically the chemical producer) in a strategic, long-term contract to supply and manage the customer's chemicals and related services. The CMS is typically remunerated in some form of the customers output (painted car doors) which gives incentives to reduce the input products (e.g. paint for car doors).

### Project findings

#### Economical benefits

- The CMS business model creates cheaper treatments of chemicals and waste water, together with more sustainable solutions.
- Reduced risks for dead stock, just in time delivery and improved data management.

	Very low extent	Low extent	High extent	Very high extent	I do not know
<b>The extend to which the companies believe that there is a potential for more similar projects/cases in their own country</b>	0	0 (1)	2	0	0
<b>The extend to which the companies believe that there is a potential for more similar projects/cases in other Nordic countries</b>	0	0	2 (1)	0	0

Note: The '(...)' denotes the experts answer.

#### Environmental benefits

- The companies using the CMS business model causes reduced use of chemicals, substitutes for hazardous chemicals and reduced amounts of waste.

<b>The extend to which companies believe that there is a positive environmental potential affiliated with their respective model</b>	Very low potential	Low potential	High potential	Very high potential	I do not know
	0	0	0	2	0

Note: No comparable expert answer was given here.

<b>The extend to which the companies believe their business model to bring about environmental benefits compared to more traditional business models</b>	Very low extent	Low extent	Same	High extent	Very high extent
	0	0	0	1	1

Note: No comparable expert answer was given here.

## Barriers

- Lack of knowledge of life-cycle costs. Companies do not understand the real cost associated with their chemical usage.
- Lack of long-term contracts and lack of trust are barriers.
- The case companies experiences that the customers CEOs seem to be less willing to budget adequately to improve the environmental impact of the company. For that reason the suppliers find it difficult to get in touch with management of the customers.
- Chemical use is not a key priority of the company.
- There is a general lack of knowledge of the business model which makes it difficult to communicate the benefits of the CMS projects and it takes a lot of resources. The providers lack good reference cases to refer to when they are trying to sell their services to the customers.
- The EU regulation on chemical substances, REACH, can be a barrier to companies that perform recycling of chemical substances. Although the original product that the reclaimed metals origin from is approved according to REACH, the reclaimed chemical substances principally also have to be approved in accordance with REACH. If the reclaimed substances are of a limited volume, the administrative costs of achieving the REACH approval are high.

The company's rating of barriers for the business model (1: least important barrier, 10: most important barrier)	Supplier's point of view	Customer's point of view
Regulation	1,8**	1,0**
Lacking will	3,0*	3,5*
Lacking abilities	2,0*	2,5*
Lacking knowledge	1,5*	4,0*
Lacking finance	4,0*	4,5*
Unclear economic benefits	5,0*	6,0*
Unclear environmental benefits	1,5*	1,5*
Other uncertain advantages	-	-
Other barriers?	-	-

Note: No comparable expert answer was given here. '-' denotes no answer was given.

Note: \*= only 2-3 respondents, \*\* = only 1 respondent

The extend to which companies believe that there are barriers for the dissemination of the model	To a very low extent	To a low extent	To a high extent	To a very high extent	I do not know
	2	1	0	0	0

Note: No comparable expert answer was given here.

## Drivers

- For all case companies the earnings are the main driver and for the customers the savings are the most important driver.
- Good reputation is also an important driver for both the suppliers and the customers.
- Regulation (like requirement of safety data sheet of all chemicals) is a very important driver for the business models as the suppliers has the expertise.
- Knowhow developed in corporation between authorities and companies.
- Corporations can focus on their core business.

Average perceived importance of barriers from the company's point of view (1: least important barrier, 10: most important barrier)	Supplier's point of view	Customer's point of view
Branding/reputation	7,7*	7,5*
Earnings	6,2*	2,0**
Savings	10,0**	8,0*
Positive environmental effects	6,8*	6,7*
Financial support from government	1,5*	1,5*
Regulation	7,5*	8,5*
Other framework conditions	-	-
Other drivers?	-	-

Note: No comparable expert answer was given here. '-' denotes no answer was given.

Note: \*= only 2-3 respondents, \*\* = only 1 respondent

## Recommendations

- Governmental support can be given to help CMS being applied, and support can be given to look into the potential for development of combined ESCO and material efficiency business models.
- Legislation can help to give incentives to companies to reduce waste generation.
- Develop more simple versions of the business models that may be relevant for SMEs, since CMS is less suitable for SMEs.
- The REACH regulation should be modified so that it promotes the use of recycled products.
- Economic incentives for recycling should be implemented.
- The environmental managers in the companies should be part of steering committee.
- Investigate whether there is a potential for local government support for companies CMS activities.

## **Questions**

- How can CMS models be further disseminated in the Nordic region?
- How can authorities support CMS activities?
- How could CMS be suited better for SMEs and what needs to be done?
- How could the benefits of using CMS be made more visible for the customers?
- How could the customers get more knowledge about these models?

## Sharing

### What is sharing?

The basic idea of 'sharing' business models is that instead of private ownership, goods are shared among a number of users. An overall advantage of this business model is, from a resource efficiency point of view, that the goods are used more intensively. Instead of owning the product the users have access to the product when it is needed.

## Project findings

### Economical benefits

- The customer does not make the initial investments to purchase the product and does not have to pay for the maintenance.
- Reduced transaction costs for the customer.
- For some product manufactures it is profitable to manufacture high quality products instead of low quality products. For example, for Bosch a manufacturer of drills, it is much more lucrative to sell high quality drills, and the company would rather concentrate on producing the high quality products than the low quality ones. In such cases there are market opportunities for shared business models.
- The economic benefits vary between the case companies.

	Very low extent	Low extent	High extent	Very high extent	I do not know
<b>The extend to which the companies believe that there is a potential for more similar projects/cases in their <u>own country</u></b>	0	0	2	2	0
<b>The extend to which the companies believe that there is a potential for more similar projects/cases in <u>other Nordic countries</u></b>	1	0	1	1	0

Note: No comparable expert answer was given here. Experts note: The dissemination of the model is very context dependant. Although car sharing has been around for a long period of time it has not become the mainstream, and car manufactures still push towards car dependency. An alternative could be for car manufactures to produce cars that are better suited for sharing, more environmentally friendly and more expensive. The car manufacturers would, however, not sell cars in the same large volumes as now. But if the car manufactures are not involved it is difficult for the business model to be disseminated.

### Environmental benefits

- The environmental benefits derive from reduced use of resources and reduced pollution.
- Manufacturers gets a strong incentive to design the product to withstand impacts from multiple users which gives an incentive to improve the durability of the product, and to design the product in a way that it can be remanufactured.

- Environmental benefits also arise from less products being brought to the market. Shared products of higher quality last longer and entail a reduced need for virgin resources.
- Where the consumer is paying for the energy usage related to the use of the product, the product provider does not have a direct economic incentive to ensure that the product is energy efficient.
- In addition, when users are sharing items it normally leads to a reduced use than if they own the items themselves. One company experiences that when their users are sharing an electric car instead of owning a car, they are more willing to supply their use of transportation with alternative means like a bicycle.

The extend to which companies believe that there is a positive environmental potential affiliated with their respective model	Very low potential	Low potential	High potential	Very high potential	I do not know
	0	0	1	2	0

Note: No comparable expert answer was given here.

The extend to which the companies believe their business model to bring about environmental benefits compared to more traditional business models	Very low extent	Low extent	Same	High extent	Very high extent
	0	0	0	0	4

Note: No comparable expert answer was given here.

### Barriers

- Lack of knowledge of real costs.
- Lack of local alternatives. A general problem is that too few shared product options are available close to consumer.
- Regulation is an important barrier for the dissemination of these models. Sharing personal items is not always clear in terms of taxation and sometimes impossible if taxation is not exempted.
- For some companies a barrier lies in the lack of openness and flexibility in the public administration towards using these new sharing models in combination with traditional solutions.
- Likewise, case companies experiences a hesitation and unwillingness in people's attitude towards sharing their personal items. This is not at least due to the existing lack of knowledge and uncertainty about the economic benefits and real costs involved.
- Some companies also find it difficult to find financing for the sharing model as the economic incentives are not sufficiently attractive and as investors are rarely interested in the environmental perspective.

The company's rating of barriers for the business model (1: least important barrier, 10: most important barrier)	Supplier's point of view	Customer's point of view
Regulation	4,3*	4,7*
Lacking will	1,0*	5,3*
Lacking abilities	1,0**	1,0**

<b>Lacking knowledge</b>	1,0**	2,5*
<b>Lacking finance</b>	8,0*	1,0**
<b>Unclear economic benefits</b>	3,5*	1,5*
<b>Unclear environmental benefits</b>	1,0**	1,0**
<b>Other uncertain advantages</b>	-	-
<b>Other barriers?</b>	-	4,0**

Note: No comparable expert answer was given here. '-' denotes no answer was given.

Note: \*= only 2-3 respondents, \*\* = only 1 respondent

<b>The extend to which companies believe that there are barriers for the dissemination of the model</b>	<b>To a very low extent</b>	<b>To a low extent</b>	<b>To a high extent</b>	<b>To a very high extent</b>	<b>I do not know</b>
	1	5	1	0	0

Note: No comparable expert answer was given here.

### Drivers

- All case companies reports that the positive environmental effect involved in the sharing model is an important driver. The expert underlines though that the environmental aspect do not always plays a central role in the sharing models. Some of the companies also underline the branding and reputation from using these models as important drivers for both the suppliers and the customers.
- Only one company has earnings as one the most important drivers. For the customers, the economic savings and convenience is important drivers. Also, through sharing the customers can avoid uncertain maintenance costs. One company reports that the social aspect of helping others by sharing your high-quality products is a driver.
- Regulation can be a very important driver if for instance the use of the shared items is exempted for taxation.
- One company also emphasize the good framework conditions they have for providing their model.

<b>Average perceived importance of barriers from the company's point of view (1: least important barrier, 10: most important barrier)</b>	<b>Supplier's point of view</b>	<b>Customer's point of view</b>
<b>Branding/reputation</b>	5,7*	9,0*
<b>Earnings</b>	5,3*	2,0*
<b>Savings</b>	1,0**	7,0*
<b>Positive environmental effects</b>	9,5*	6,8*
<b>Financial support from government</b>	4,0*	4,0*
<b>Regulation</b>	8,5*	10,0**
<b>Other framework conditions</b>	-	--
<b>Other drivers?</b>	-	-

Note: No comparable expert answer was given here. '-' denotes no answer was given.

Note: \*= only 2-3 respondents, \*\* = only 1 respondent

## **Recommendations**

- The tax relief structure makes it attractive to commute in private car. The incentive could be changed so support is given to members of car-sharing organisations or users of public transportation.
- It can be important to provide the consumers with the services that fit their needs - also where this entails an expansion of the original business model.
- The main problem is that owning products and especially homes and cars makes it easier to borrow money from the bank. So the ownership norm is supported by the financial institutions. This spills over to smaller and cheaper products – the entire institution of ownership should therefore be reconsidered at least for products where it is possible to introduce sharing models or PSS.
- The innovative green business models should be better integrated into the traditional public planning. They should not be seen as competitive alternatives rather as new complementary solutions.
- The provision of clear regulatory framework conditions such as tax exemption is important for the dissemination and growth of the sharing models.
- A clarification for governmental investors and other investors on how to invest in business models aiming at reducing environmental impacts would help to develop sharing business models.
- Implement carbon taxes fully. This will lead to consumer pressure for green suppliers.
- Make better tax incentives for green companies like what has been done with great success for startup companies.

## **Questions**

- How could taxation of sharing items be made more clear? What are the obstacles?
- What are the main barriers you face, when you are working with the public administration?
- What can providers of sharing models do to change people's attitude towards using sharing models and share their personal items? Could the social aspect of being user of a sharing model be used more constructive in the dissemination of the models?
- What could the sharing providers do to promote these models?

## Other Product Service Systems (PSS)

### What is Product Service System?

Companies which make use of green PSS models are characterized by supplying both products and services or delivering functionality to the customer. If the particular company doing so reduces emissions, material use or waste, then it is a green PSS model. The supplier is usually engaged in the customer's production chain and thus sharing a risk (e.g. investing in the customer's production chain).

### Project findings

The group of 'other PSS' is the least homogeneous group of all of the types of models investigated in the project. The findings stated below thus vary a lot from case to case, so it is difficult to list common characteristics.

The case companies have all more or less moved into a new business area. The companies are still developing and refining the models and they are working and experimenting on finding the right way of structuring the model.

### Economical benefits

There are very different benefits for the customers of PSS models depending on the different products and services the providers are offering:

- Lower investment level for customer equals lower risks for customer (ownership issue). This improves customer cash flow and the customer can therefore invest this money in other ways.
- Money can also be saved as the customer does not have to develop knowledge on how to repair/maintain the product. The customer knows the cost in advance which contributes to reduce risks.
- If the service provider can decrease the needs for services and spare parts, she will be able to cut costs and hence make the same earnings as with traditional business models - or even make a larger profit.
- Benefits like lower cost on waste management (up to 25 %), reductions on the electricity bill (6-20 %).
- Cheaper and renewable energy for cars.
- 1.5-2 % better performing airplane engines, lower maintenance costs, longer product lifetime, less 'down time' and cheaper prices for the customers.

	Very low extent	Low extent	High extent	Very high extent	I do not know
<b>The extend to which the companies believe that there is a potential for more similar projects/cases in their own country</b>	0	0	3 (1)	4	0
<b>The extend to which the companies believe that there is a potential for more similar projects/cases in other Nordic countries</b>	0	1	1 (1)	5	0

Note: The '(...)' denotes the experts answer.

### Environmental benefits

- Most of the companies which are in this category provide energy savings for the customers leading to reduced CO<sub>2</sub> and NO<sub>x</sub> emissions and material savings.
- Some of the companies work with the use of energy in an intelligent way (smart grid), so that it becomes easier for other PSS companies to sell a service alongside their product instead of just selling a product.
- Other companies create energy savings from better handling of organic waste, and may also create new useful products from the waste.

The extend to which companies believe that there is a positive environmental potential affiliated with their respective model	Very low potential	Low potential	High potential	Very high potential	I do not know
	0	0	4	3 (1)	0

Note: The ‘(...)’ denotes the experts answer.

The extend to which the companies believe their business model to bring about environmental benefits compared to more traditional business models	Very low extent	Low extent	Same	High extent	Very high extent
	0	0	0	3 (1)	4

Note: The ‘(...)’ denotes the experts answer.

### Barriers

- Traditional mindset is the most important barrier for PSS. Lack of willingness to make changes. Many company managers hesitate to make larger changes to their organisation.
- The way bonus systems are organised is a barrier in some companies. At management level, the bonus systems are typically based on the sales volume of services and spare parts.
- Public procurement rules. Public procurement rules are an obstacle to PSS. The existing regulation prevents public authorities from demanding PSS and including PSS elements into their requirements in tender documents.
- Separation between organisational bodies for investments and operation. In both public and private organisations, there is often a separation between the financial bodies that are responsible for investments and the bodies responsible for operation.
- Barriers for the PSS companies relates to foreseeing and mitigating the risks involved with reducing the start up investments for the customers.
- Since the PSS companies needs to promote their business models by making the benefits more visible for the customers, an extra effort has to be made.
- Customers lack of knowledge of the PSS business models, i.e. customers are not fully aware of nature of (or believe in) the services and products as well as the economic and environmental benefits in-

volved. For that reason, the customers hesitate to buy in to the PSS model.

<b>The company's rating of barriers for the business model (1: least important barrier, 10: most important barrier)</b>	<b>Supplier's point of view</b>	<b>Customer's point of view</b>
Regulation	5,0	4,2
Lacking will	2,0	4,6
Lacking abilities	1,4	2,5
Lacking knowledge	1,8	7,3
Lacking finance	3,4	4,7
Unclear economic benefits	2,6	2,8
Unclear environmental benefits	1,4	1,8
Other uncertain advantages	1,0*	
Other barriers?	6,5*	3,5*

Note: No comparable expert answer was given here. '-' denotes no answer was given.

Note: \*= only 2-3 respondents, \*\* = only 1 respondent

<b>The extend to which companies believe that there are barriers for the dissemination of the model</b>	<b>To a very low extent</b>	<b>To a low extent</b>	<b>To a high extent</b>	<b>To a very high extent</b>	<b>I do not know</b>
	1	5	1	0	0

Note: No comparable expert answer was given here.

### Drivers

- The economic benefits for both the suppliers and customers are the most important driver. For the customers it is both the economic and environmental benefits which are important.
- Idealism is a more important driver.
- Customers also see a great branding value in saving energy.
- Companies report political regulation (and incentives) to save energy as a very important driver for their business.

<b>Average perceived importance of barriers from the company's point of view (1: least important barrier, 10: most important barrier)</b>	<b>Supplier's point of view</b>	<b>Customer's point of view</b>
Branding/reputation	4,8	5,8
Earnings	8,5	10,0**
Savings	5,0**	9,3
Positive environmental effects	6,6	6,2
Financial support from government	5,3*	6,0*
Regulation	5,4	7,6
Other framework conditions	4,0*	4,0*
Other drivers?	-	10,0**

Note: No comparable expert answer was given here. '-' denotes no answer was given.

Note: \*= only 2-3 respondents, \*\* = only 1 respondent

## **Recommendations**

- Research should be conducted on which sectors and product groups that PSS - from a society perspective - would be best suitable for, i.e. where the largest socio-economic and environmental benefits would emerge.
- Show cases of the best examples of PSS should be made. The economic and environmental benefits should be shown to customer and potential service providers. This could contribute to convince them of the virtues of the concept. Such case studies should show the real potential of the business models. If the industry realises that providing and demanding PSS are in their interest, companies will use the needed resources to develop contract and design products for PSS. A spin-off will be that the government properly also will look at the possibilities of using PSS in public procurement.
- Provide economic incentives for the customers to save energy.
- Standardize the energy saving products.
- Regulation and political incentives (taxes) to use energy saving products.
- Bring forward venture capital and risk willing investments in innovative green initiatives.
- Provide more information to the customers about the benefits.
- Set up a trust for energy saving projects.
- Generally set up public incentives and regulation for investing in energy saving products.

## **Questions**

- What are the obstacles for intelligent use of energy from the grid?  
Could the Norwegian system be used in other countries?
- How could large start up investments be avoided in some of these models?
- How could the customers get more knowledge about these models?
- How could the benefits of using these models be made more visible for the customers?
- What could the PSS providers do to promote these models?