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Key Messages

- There is a need for well-functioning systems and business models to improve the reuse and recycling of textiles in the Nordic region and at the same time create green jobs. Clearer responsibilities in the value chain can provide some of the incentive for improvements in the textile sector, while innovative and more sustainable business models provide an opportunity for improving business bottom lines, consumer satisfaction, and reducing resource use and environmental impact.
- Three policy packages that can be used to encourage the establishment of extended producer responsibility (EPR) systems and innovative new business models were therefore proposed and assessed:
  1. Policy package 1: Mandatory extended producer responsibility (EPR) complemented by a tax on hazardous chemicals in textiles.
  2. Policy package 2: Voluntary collective EPR complemented by recycling certificates and raw material fees.
  3. Policy package 3: Measures supporting new business models.
- Mandatory and voluntary collective EPR systems would have a significant impact on collection of used textiles, but a more limited effect on the pre-consumer (upstream) stages of the textile life cycle. On the other hand, widespread use of alternative business models have a clear upstream effect, but perhaps more minor impacts on overall collection, reuse and recycling.
- EPR systems should avoid jeopardising and financially undermining existing collection systems. Ambitious but realistic targets for collection, reuse and recycling should set the frame for and drive the system forward.
- Supplementary policies to the EPR systems – chemical taxes, recycling certificates and raw material fees – need to be further investigated in their application to textiles before implementation. Currently they do not have the industry's support.
- The pool of policy measures tackles three key obstacles identified as being common to most new business models: Lack of quality and durability in textiles, lack of awareness of alternative models as well as unfavourable price differential between the high cost of labour in Nordic countries and the cheap cost of imported textiles. The first and last challenges are intimately connected.

- Design for durability is an important supporting element of lease, repair, clothing libraries, luxury second hand and resell of own brand models. Policies are needed which encourage design for durability and higher quality.
- Traditional perceptions of selling, buying or owning textiles are a common barrier to all of the business models identified. Raising awareness of alternatives amongst both consumers and producers is crucial to their dissemination and acceptance.
- The potential magnitude of collection is the most crucial characteristic with respect to overall environmental gains. Mandatory or widely adopted voluntary collective EPR systems can collect much larger volumes than in-store collection and resell of used own brand models.
- The reuse element gives by far the largest environmental gain per collected tonne compared to models based on recycling. A technological breakthrough in cost efficient high grade recycling combined and design of textiles for recycling would work in favour of all models.
- The EPR systems have potential for creating green jobs in collection, reuse and recycling, which might be created in regions where markets for sorting and low grade recycling already exists rather than in the Nordic countries. The alternative business models supported by Policy Package 3, on the other hand tend to create jobs close to the consumer and thus would be placed in Nordic countries.
- The many synergies between the different systems serves to strengthen and overcome individual system's weaknesses. The voluntary or mandatory EPR systems are mutually exclusive but either one of them can, and perhaps should, be accompanied by additional measures to promote alternative businesses. Thus, the expanded collection of used textiles can be supplemented by upstream effects such as design for longer active lifetimes of products.

Summary

This report is the primary outcome from Part II of the project "An extended producer responsibility (EPR) system and new business models to increase reuse and recycling of textiles in the Nordic region" initiated by the Nordic waste group (NAG). This report is also the second and final report in the series of two reports from this project. The first report, which presented the outcomes from Part I of the project, was published in June 2014. The report is available for download on the Nordic Council of Minister's website.

The aim of this second report is to propose three packages of policy instruments for EPR systems and business models based on lessons learned in Part I of the project. Further, the aim is to assess the potential of the different EPR systems and business models in terms of critical factors, risks and synergies.

The full project – comprising Part I and II – is part of the Nordic Prime Minister's green growth initiative, The Nordic Region – leading in green growth. The project is one of three textile related projects and has been a joint cooperation between Copenhagen Resource Institute (Denmark), IVL (Sweden), Østfoldforskning (Norway), SYKE (Finland), IIIEE at Lund University (Sweden) and Environice (Iceland). The project began in June 2013 and finished at the end of 2014.

The work has been carried out through a combination of literature studies and consultation with key stakeholders. Stakeholder involvement has been ensured through the establishment and consultation of a Reference Group comprising a broad spectrum of experts and industry representatives. Further, stakeholder input has been obtained via two workshops held in November 2013 in Stockholm and October 2014 in Copenhagen. Both workshops were coordinated by the Sustainable Fashion Academy in cooperation with the Nordic Council of Ministers.

Read more about the Nordic Prime Minister's green growth initiative in the web magazine "Green Growth the Nordic Way" at nordicway.org or at norden.org/greengrowth

Structure

This second part of the project (the subject of this report) presents proposals for three packages of policy instruments based on the lessons learned in Part I. The report is divided into two sub-reports corresponding to the two main tasks of Part II of the project. These tasks follows on the tasks described in the report from Part I.

The elements in the three proposed policy packages are not described in detail, but are intended more as inspiration and a starting point for Nordic governments.

The three proposals for policy packages are:

- *Policy Package 1* – Mandatory extended producer responsibility (EPR) with a tax on hazardous chemicals in textiles as a possible supplementary instrument.
- *Policy package 2* – Voluntary collective EPR with recycling certificates and raw material fees as possible supplementary measures to strengthen the market for reused and recycled textiles.
- *Policy package 3* – Pool of policy instruments that would support and spread a broad range of promising new business models that increase the active lifetime, reuse and eventual recycling of textiles.

Each package includes a number of different complementary policy instruments. However, different elements of each package can also be implemented separately or combined with elements from other packages. For example, a voluntary EPR could be implemented without recycling certificates or raw material fees. Recycling certificates or raw material fees could also be combined with a mandatory EPR.

The third package is not intended to support Extended Producer Responsibility systems, but rather to support business models like leasing, repair, second-hand sales etc. However, some of the elements within it could also have a positive contributory effect on collective voluntary or mandatory EPR systems. As such, Policy Package 3 or its various individual elements can be implemented in parallel with either Policy Package 1 or 2.

Results

When considering where the proposed policy packages have their impacts, it is clear that both mandatory and voluntary collective EPR systems would have a significant impact on collection of used textiles but a more limited effect on the pre-consumer (upstream) stages of the textile life cycle. On the other hand, widespread use of some alternative business models supported by Policy Package 3, such as leasing and resell of own brand, have a clear upstream effect, but perhaps more minor impacts on overall collection, reuse and recycling.

The EPR systems have potential for creating green jobs in collection, reuse and recycling but might to a large extent create jobs in other regions where markets for sorting and low grade recycling already exists, rather than in the Nordic countries. With limited development in sorting and recycling technology, the short-term effect will likely be export of mixed used textile fractions for sorting outside the Nordic countries.

The alternative business models supported by Policy Package 3, on the other hand, are often more labour intensive and tend to create more local green jobs involved in take-back, repair, laundering and resell of textiles. Such jobs need to be close to the consumer and thus would be placed in Nordic countries.

A further difference is that the EPR systems, in particularly a mandatory system, would create large flows of used textiles. This is a prerequisite for investment in sorting and recycling technology. With proper supplementary measures, this can create an opportunity for increased investment in this area within and outside of the Nordic countries. This is not the case for most of the alternative business models, which primarily focus on prolonging the lifetime of textiles rather than recycling.

There is therefore potential for many synergies between the different systems to strengthen each other's weaknesses. The voluntary or mandatory EPR systems are of course by definition mutually exclusive but either one of them can, and perhaps should, be accompanied by additional measures to promote alternative businesses such as leasing, clothing libraries, resell of own brand etc.. Thus, substantial collection of used textiles can be supplemented by upstream effects, such as design for longer active lifetimes of products.

The supplementary policies – chemical taxes, recycling certificates and raw material fees – need to be further investigated in their application to textiles before implementation. As of today, these instruments do not have the industry's support.

Proposals for policy packages that support EPR-systems and new business models for reuse and recycling of textiles

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List of abbreviations

CoC	Code of Conduct.
CSR	Corporate Social Responsibility.
DEFRA	Department of Environment, Food & Rural Affairs.
EPA	Environmental Protection Agency.
EPR	Extended Producer Responsibility.
GRS	Global Recycle Standard.
NCM	Nordic Council of Ministers.
PER	Tetrachloroethylene.
PRO	Producer Responsibility Organisation.
SME	Small and Medium-sized business.
TCE	TetraChloroEthylene.
VC	Voluntary Commitment.
WEEE	Waste Electrical and Electronic Equipment.
WRAP	Waste and Resources Action Programme.

1. Introduction

1.1 Context and overall aim

The project "An extended producer responsibility (EPR) system and new business models to increase reuse and recycling of textiles in the Nordic region" is part of the Nordic Prime Minister's green growth initiative, The Nordic Region – leading in green growth. The initiative identifies eight priorities aimed at greening the Nordic economies, one of which is to develop innovative technologies and methods for waste treatment.

The production and consumption of textile products is linked to significant environmental impacts. Much of these are caused during the production phases from the growing of cotton for cotton products through production and treatment of fibres, production, dyeing and finishing of fabrics and finally the fabrication of textiles products. The use phase is associated with significant consumption of energy and water and the use of chemicals for washing, drying and dry cleaning.

There are many options for directly reducing the environmental impacts of production processes for textiles. This project, however, focuses on the use and end-of-life phases. Nevertheless, redirecting and optimising these phases can give significant knock-on environmental gains upstream.

Across most of the Nordic region the end-of-life phase does not in itself lead to significant environmental problems: in Sweden, Norway and Denmark at least, incineration with energy recovery is the end point for most municipal waste. This offsets the use of fossil fuels for generation of heat and power.

Incineration, however, is not the optimal management option for textiles waste. Recycling of textile waste back into fibres for new textile products gives higher environmental benefits than incineration by offsetting the production of virgin fibre (Palm, 2011). It also gives higher environmental benefits than recycling of textiles into industrial rags or insulation, as is currently the main fate of those textiles, which are recycled.

Extending the lifetime of textile products can give even greater environmental benefits by offsetting the entire production phase of new products.

Recirculating post-consumer products back into the economy via second-hand markets is one way of extending the active lifetimes of products and thereby offsetting demand for new. There are, however, other business models, which have the effect of extending lifetimes of products i.e. leasing, hiring, repair services etc.

This NCM-commissioned project is concerned with investigating extended producer responsibility systems and also business models which lead to extended lifetimes of clothing and home textiles products (excluding carpets), and increased recycling at end-of-life. These systems and businesses models can give environmental benefits extending all the way upstream through the production phase of textiles.

Two other NCM-commissioned projects are running in parallel with this one. One of these concerns establishing a Nordic commitment and related codes of conduct for actors in the value chain of textiles. A further project concerns mapping current flows of textiles collected, sorted, reused and recycled and emerging technologies which can improve these markets. These projects are referred to through the text of this report.

The first phase of the EPR and new business models project concerned mapping out and evaluating existing EPR systems and new business for textiles. This is reported on in Watson, *et al.* 2014. The main aim for 2014 is to propose policy packages, which would support the more promising of the EPR systems and business models.

This report presents proposals for three packages of policy instruments. The elements in the packages are not given in great detail but are intended more as inspiration and a starting point for Nordic governments.

A subsequent report will present a first evaluation of the strengths and weaknesses of elements within individual policy packages. The evaluation will not be in-depth enough to allow recommendation of one policy package over another. Nordic governments who wish to implement these packages or elements within them, should commission a more substantial and quantitative impact assessment.

1.2 This report

Three draft proposals for policy packages are described in this report:

- *Policy Package 1* **–** Mandatory extended producer responsibility (EPR) with a tax on hazardous chemicals in textiles as a possible supplementary instrument.
- *Policy package 2* – Voluntary collective EPR with recycling certificates and raw material fees as possible supplementary measures to strengthen the market for reused and recycled textiles.
- *Policy package 3* – Pool of policy instruments that would support and spread a broad range of promising new business models that increase the active lifetime, reuse and eventual recycling of textiles.

Each package includes a number of different complementary policy instruments. However, different elements of each package can also be implemented separately or combined with elements from other packages. For example, a voluntary EPR could be implemented without recycling certificates or raw material fees. Recycling certificates or raw material fees could also be combined with a mandatory EPR.

Note that the third package is not intended to support Extended Producer Responsibility systems, but rather to support business models like leasing, repair, second-hand sales etc. However, some of the elements within it could also have a positive contributory effect on collective voluntary or mandatory EPR systems. As such Policy Package 3 or its various individual elements can be implemented in parallel with either Policy Package 1 or 2.

1.3 Consultation process

First draft policy packages were circulated with an extended Reference Group in March 2014 for reaction and input. The extended Reference Group includes 32 Nordic stakeholders from textile brands and retailers including companies, which have adopted alternative business models, government agencies, post-consumer textile collection organisations, academics and finally agencies responsible for overseeing EPR systems for other types of products.

The following stakeholders responded to the consultation with comments and inputs.

Respondent	Organisation
Kerli Kant Hvass	Copenhagen Business School Centre for CSR and KEA Design, Denmark
Tina Hjort	KEA Design, Denmark
Vigga Svensson	Entrepreneur and establisher of Katvig, Denmark
Johnny Bøwig and Ulf Gilberg	DPA –system, Denmark (overseeing EPR system for WEEE)
Kirsi Niinimak	Alto University for Art & Design, Finland
Sanni Pekkala	SOK, Finland
Minja Huopalainen	UFF, Finland
Cecilia Brännsten	H & M, Sweden
Maria Sandow	Svensk Handel, Sweden
Henrik Willers	Sveriges textil- och Modeföretag, Sweden
Sara Winroth	Lindex, Sweden
Marianne Haugland	KS Bedrift (Municiaplitie's organisation), Norway
Monika Lahti	Miljødirektoratet, Norway
Eirik Oland	Green Dot, Norway (implementation of packaging EPR system)
Bryndís Skúladóttir	SI – the Federation of Iceland Industries, Iceland

The authors have taken account of many of the comments in this final version of the report.

Where respondents have criticised the inclusion of specific individual elements of the packages – e.g. the raw material fee in PP2 – a different approach has been taken. Rather than removing these from the packages the criticisms will be taken into account in the assessment of strengths and weaknesses of individual policy package elements in the next report.

2. Policy package 1 – Mandatory EPR and tax on harmful substances in textiles

2.1 Goal of PP1

Policy Package 1 focuses on policy instruments that would *establish a mandatory EPR system for clothing and home textiles.* It includes an optional additional instrument for reducing the potential for trace hazardous chemicals in collected post-consumer products.

The first step in developing the policy package is identifying the key goals and objectives of the mandatory EPR system, which the policy package would establish.

Well-functioning systems exist in all Nordic countries for the collection and subsequent sorting and reuse of post-consumer clothing. These are described in detail in the reporting from a parallel NCM project (NCM, 2014b). However, the current systems fail to capture most post-consumer textiles and a large part of these end in mixed municipal waste destined for incineration or landfill (some parts of Finland). Collected quantities range from approx. 23% to 45% of clothing and home textiles put on the market. In other words between 55% and 77% is not separately collected and returned as a resource into the economy (NCM; 2014b).

The key goal of PP1 is therefore to establish a mandatory EPR system which *increase the share of new textiles put on the market which, following end of use by the original owner, is separately collected and made available for reuse and, where reuse is no longer possible, for recycling.*

A further gap in existing systems is that, while there is a healthy Nordic and export market for reusable clothing, recycling markets for textiles which is no longer suitable for reuse are weak (Palm *et al.*, 2014a). The recycling of textiles that does occur is almost entirely limited to downcycling i.e. recycled as industrial rags, insulation materials etc. Used fibres are not being recycled back into new textile products. The lower the quality of new textiles put on the market the higher the share

of post-consumer textiles that are unsuitable for reuse and which currently can only be downcycled (Ibid).

The lack of recycling potential is mainly caused by a lack of available technology for separating and sorting fibres. It is hoped that this will eventually be solved by technological developments. The EPR can potentially aid this situation *by encouraging design of textile products so that they are more suitable for reuse and subsequently for closed loop recycling.*

A final goal of the package for the sake of effectiveness and minimum disruption to existing collection systems should be *to build on existing collection systems as far as possible.*

2.2 Overview of the package

This policy package was developed based on experiences from current EPR systems and on evaluations of strengths and weaknesses carried out in 2013 (Watson *et al.* 2014). Special attention has been given to the experiences of the French EPR system for textiles.

The proposed EPR system has been designed with the aim of interacting with existing collection of post-consumer textiles as far as possible. Cooperation with municipalities and other actors organising collection of post-consumer textiles is seen as essential.

Policy package 1 includes:

- Specification of which products should be covered by the regulations, and who should be held responsible as "producers".
- Allocation of responsibility to producers including penalties for non-compliance.
- Targets for collection, reuse and recycling.
- Incentives for encouraging upstream effects, such as reduced use of hazardous chemicals and use of recycled material in garments.
- Transparency, monitoring, traceability and reporting mechanisms.
- Support for collectors and/or sorters.
- Communication.
- Criteria for approval of central organisations for administering the system.

These elements are described in more detail under section 2.4 following an introduction in 2.3 to some of the considerations that have been taken into account when designing the policy package.

2.3 Introducing the mandatory EPR

Individual and collective systems

Extended Producer Responsibility (EPR) is a policy principle to promote producers to take responsibility for the entire life-cycle of their products, with special focus on the end-of-life management.

Currently only one country, France, has imposed a mandatory EPR on textile producers. Since 2007, French companies that produce and import clothing, linen and footwear are by law responsible for providing for or directly managing the collection, reuse and recycling of their products at the end of their usage. Mandatory EPR legislation exists for other types of products in Nordic countries e.g. packaging, waste electrical and electronic equipment (WEEE) and batteries.

Most mandatory EPR regulations give producers two options for managing this practice: i) they can organise their own collection, reuse and recycling program that is approved by the state or ii) contribute financially to one or more central organisations, which are accredited/approved by the state, and which oversee the collection and management of post-consumer products for several producers (a collective system). Both these options are allowed for in the package proposed in Section 2.4.

Most producers in France (93%) have chosen to be part of a collective system option run by Eco TLC, the only organisation that has been accredited by the French public authorities to cover for the sector. The remaining 7% are free-riders in the system. To limit the share of free-riders, EPR regulations should include penalties for producers who do not take part in an accredited EPR system.

Producer responsibility organisations

Accredited organisations that organise the collection and management of post-consumer products for several producers are termed Producer Responsibility Organisations (PROs). PROs may themselves have cooperative understandings with a large number of *operators* (sub-contractors) that collect and handle post-consumer products.

Mandatory EPR legislation should, as a minimum, set targets for collection, recycling and reuse. It may also determine some key characteristics of the means by which producers fulfil these targets. Other characteristics of collection schemes may be left to the discretion of the producers/PROs who might be in the best position to determine how most effectively to meet the collection, reuse and recycling targets imposed on them.

The legislation should also define which products are covered by the system, which organisations are considered to be producers, and what the scope of their responsibility should be. Here there are two main di-

mensions: what part of the take-back chain the producer is responsible for, and the types of responsibilities the producer needs to assume, i.e. physical, financial and informative (Lindhqvist, 2000).

EPR legislation usually includes minimum criteria which must be met by accredited EPR systems and PROs. In Nordic countries this often, but not always, includes the requirement the PRO is a non-profit organisation. Since, different stakeholders who would be affected by an EPR have different sometimes conflicting interests it is also important who is represented in the board of a PRO and who maintains the balance of power. This can have serious consequences for the way in which the PRO is run and may also need to be defined by the legislation. A "power analysis" of key stakeholders should be carried out by individual Nordic governments prior to designing this part of the legislation.

Transparency of operations is of key importance, and minimum criteria for transparency should also be included in legislation. This would cover a minimum level of information which allows authorities to see whether collection, reuse and recycling targets have been met. It should also include requirements for reporting on what happens to money raised by the scheme.

PROs charge their members (the producers) a minimum fee which would allow the PRO to reach the targets set by the legislation. For an individual member the size of this fee depends on the quantities of new products which that member places on the market.

PROs and existing operators

As specified in the goals, mandatory EPR regulations should build on existing systems. The PRO will typically make contracts with existing collection and sorting organisations (municipalities, charities and other collecting organisations) and new actors that will organise the collection activities. This is how the French EcoTLC scheme operates.

We call these contracted organisations *operators*. To ensure transparency and to allow PROs to report on progress against targets, the operators would typically be required by the PRO to report on collection, reuse and recycling quantities, and transfers of collected material to other actors. If the collection targets are ambitious the operators will need to accept all types of textiles from the public e.g. including worn out or soiled items. Currently most collectors only accept directly reusable textile products or those which only require minor repair.

Participation as operators in schemes would give existing collection organisations/charities some advantages: 1. inclusion in the system can increase the recognition of the organisation by the public; 2. municipalities may give preference to participating collectors when deciding who may

put up containers on public land (see later). However, operators may also demand additional compensation from the PRO for reporting activities and for collecting and handling textiles that cannot be reused.

There are two options for providing this compensation:

- *Firstly,* the PRO could decide to provide payment directly to operators. Either per tonne of textiles collected by operators or only those finally delivered to sorters. This latter would take account of the fact that many charities may wish to continue to skim off the better quality textiles for resale in their own shops.
- *Alternatively*, as in the French legislation, the PRO could financially support the registered sorters only per tonne of textiles which they receive from registered operators (but not collectors who aren't registered with the PRO). This may indirectly support the collectors by increasing the price they receive for what they send to the sorters but would avoid double counting if collectors transferred textiles to one another.

Both systems have their pros and cons. For the Nordic countries where, due to relatively high labour costs, much of the collected textiles are currently exported for sorting, the second system would involve sending financial support out of the country, which may not be so appetising for Nordic governments. Here the first system where collectors are supported might be more appropriate. Alternatively support could be limited to sorters located within national borders to support the creation of Nordic jobs.

Nordic governments will need to carry out more detailed impact assessments before deciding which option they should promote via legislation, or alternatively allow the PRO to decide.

PROs and municipalities

Municipalities will have a significant role in their relationship to the PRO. In all Nordic countries it is municipalities who are responsible for the collection and management of household waste. Currently, very few municipalities collect textile waste separately. However, once an EPR is established, there may be strong incentives for municipalities to take on the role of an operator described above.

They also have a key controlling stake in the potential market for operators since under current regulation municipalities own household waste. Although dispensation is often given for post-consumer products that are donated to a collecting organisation sometimes this only applies to 1) donations to charities and 2) products that are fit for reuse. This

varies from country to country. Under all circumstances these regulations will need to be reviewed to allow EPR regulations and PROs to operate (see later).

Household participation

The active participation of households is central to a well-functioning EPR system. Mueller (2013) and Joung (2013) argue that the most important factor in active household participation is *convenience*. Governments can choose to specify characteristics of the collection network directly in EPR regulations to ensure that convenience is assured. For example, the Swedish EPR regulations for packaging require that "*a producer shall ensure that there is a suitable collection for packaging which is attributable to the producer. A collection should be regarded as appropriate if it is easily accessible, eases the process for those who leave packages and otherwise provide good service to those who leave packaging waste to the system*".

However, giving strict requirements in regulation on the density of a collection network reduces the ability of the PRO to meet collection targets in the most cost effective way. Particularly in the large, sparsely populated countries of Norway, Sweden and Finland it might be most cost effective to concentrate collection operations in urban areas and then need to spread collection points out into the more sparsely populated municipalities as targets become more ambitious.

An effective EPR system also requires that households are informed of the measures and their intended effects, and what their role is in this system, for instance, additional sorting. Information should make clear the need for collection and the practicalities surrounding the collection, such as the availability of collection sites. It might also include general information about textiles, waste management and recycling.

Addressing the upstream effects

It is important that EPR legislation to a certain extent includes measures that ensure upstream effects which reduce impacts upstream and also which ensure products that are better suited to reuse and recycling. Upstream effects can include: 1. higher quality and more durable products to allow longer active lifetimes 2. design for easier disassembly and preparation for closed loop recycling.

With respect to the latter, current recycling technology cannot split products made from mixed fibres – e.g. a cotton/polyester mix product – into individual fibre types in preparation for recycling (Palm *et al.*, 2014a).

Under current technology, closed loop recycling can only be carried out for single fibre products i.e. products made entirely from cotton or

entirely from polyester. Moreover, cotton is not well suited to recycling back into cotton products due to shortening fibre lengths and needs to be supplemented by high shares of virgin cotton.

Therefore, *under current recycling technology*, design for closed loop recycling would mean avoiding mixing fibres in new textile products and perhaps also avoiding cotton in products.

However, fibre mixes can give durability and quality characteristics. Since extending lifetimes gives greater environmental benefits than closed loop fibre recycling design for durability should be prioritised. Not enough research has been carried out on these issues to identify whether or not they conflict with one another.

Moreover, technology is under development for separating fibres either mechanically or chemically and also for chemical recycling of cotton into viscose. This might make design for ease of recycling unnecessary in the longer term.

A further issue is the use of hazardous chemicals in textile production. According to the Swedish Chemical Agency (2012) the use of persistent chemicals in the production of textiles can challenge the concepts of a closed loop economy, since they will tend to accumulate in recycled materials. This may be less problematic under chemical recycling than mechanical recycling but again the research to confirm this is not available. Reducing the use of certain chemicals in textiles production would increase suitability for recycling and would also reduce environmental impacts.

EPR regulations can require the inclusion of incentives for upstream effects. Incentives can take the form of reduced producer fees for products put on the market which have been designed for ease of reuse, ease of recycling and which reduced chemical use.

To qualify for reduced fees, producers would need third party assurance that they had fulfilled the criteria. This raises the issue of whether such rebates would function in reality.

EPR fee rates per product are not likely to be high. Therefore, it will only make economic sense to a company to design in characteristics where third party verification systems already exist and where they either are simple and cheap or give other additional advantages to the company i.e. are in line with its CSR strategy etc.

The French system includes fee rebates for products which have a minimum 10% recycled fibre content. Since a verification system for this exists this could also be included in Nordic EPR systems. Relevant third party assured eco-labels could be one of the ways of verifying compliance with criteria on chemical use.

Due to the reasons given above, fee rebates for single fibre use may not be advisable and design for durability is difficult to verify.

Such reductions in PRO fees when included in an EPR for a single Nordic country, or even the Nordic countries as a whole cannot be expected to substantially affect the design and production in large multinational companies. However, it can affect the actions of smaller producers and part of the assortment for larger producers, and also provide a potential blueprint for an eventual EU Directive for textiles.

Finally, if incentives for upstream effects are to work then the definition of "*the producer*" under the EPR system is of key importance. The producer should ideally have control over design processes, either because the business directly designs products, or because they as purchasers have a strong say over the design of products purchased and put on the market.

Restricting chemical content

With respect to chemicals further supplementary legislation *over and above* the EPR legislation could support the EPR system. The Swedish Chemical Agency (2012) proposes that a tax on clothes and shoes that contain highly fluorinated substances, biocides or phthalates should be enforced in order to reduce the amount of chemicals in textiles.

Other substances can be targeted after further investigation, but the principle is to start with a tax on some substances and work up the ladder. Economic instruments have proven to be effective in reducing sale of products that contain unwanted chemicals. For instance, taxing lead in gasoline in Sweden was a contributing factor to its phase-out and the tax on cadmium in fertilisers has to some extent contributed to reducing its content. In Norway taxes have successfully reduced the use of trichloroethylene (TRI) and tetrachloroethylene (PER) (Swedish Chemicals Agency, 2012).

The Swedish government has already begun investigating the use of such a tax and if the investigation recommends such a tax they will present a proposal on the tax rates and scope of eventual regulation by end 2015. Bisaillon *et al*. (2009) proposed a tax of 2 SEK/kg to be paid by producers on products containing more than 0.1% of such a substance. However, Ekvall *et al*. (2010) found that the tax was too low compared to the economic value of most hazardous substances. They argued that the tax would have little effect on the price of the products and thus on the demand for these products.

Some industry representatives in the extended Reference Group have pointed out that a tax on chemical content in textile products may be difficult and bureaucratic to administer since it would require regular testing of all product lines put on the market. They also question wheth-

er such a tax adopted at national level in the relatively insignificant Nordic markets would have any real effect on textile production. They propose that the REACH regulations in combination with non-regulatory approaches may be the preferred way forward. Examples of the latter are efforts by the Swedish Chemical Group in developing substitutes for suspected hazardous substances, and a dialogue forum between the Swedish Chemical Inspection Agency and the textile industry.

These issues will be considered further in the evaluation of the policy proposals under chapters 7, 8 and 9 of this project.

2.4 Policy instruments

In this section some potential content of mandatory EPR and related legislation in Nordic countries is proposed in more concrete form based on considerations described earlier.

2.4.1 EPR legislation

Scope of products
We propose that products under the two digit CN codes 61 and 62 are covered by EPR legislation.[1] These cover clothing and other apparel and home textiles products.

Definition of producers
As described earlier, for upstream effects to work then the producer should ideally have control over design processes. Either via the business directly designing products, or via the business' role as bulk purchaser and subsequently retailer of textile products in its stores.

We propose that the producer in EPR legislation is defined as an organisation, who 1) designs and manufacturers or subcontracts the manufacture of *new textile products* for sale in the country, or 2) purchases *new textile products* for import and subsequent retail.

A minimum threshold of new textile products put onto the market should be defined over which actors can be considered as producers under the regulations. This is to protect small producers from bureaucracy in the system.

[1] http://www.cnwebb.scb.se/?languageId=GB

Targets

Targets for separate collection of textiles and for reuse and recycling of the separately collected materials should be established in regulations. Targets will need to take account of the current level of collection, reuse and recycling in the country. This differs significantly from country to country in the Nordic region.

The following targets have been suggested by the Swedish EPA in a proposal published in the autumn of 2013:[2]

- By 2018 there are convenient collection systems that ensure that textiles are primarily reused.
- In 2020, 40% of the textiles that are set on the market are reused.
- In 2020, 25% of the textiles that are set on the market are recycled primarily into new textiles.
- By 2020 the textile cycle should be coordinated so that substances with undesirable properties are no longer present in virgin textiles.

However, in order to prioritise reuse over recycling in accordance with the waste hierarchy, we suggest it may be more appropriate to set a *collection target* (as share of textiles put on market), a *reuse target* (as share of the collected textiles) and a *recycling target* (as share of the residuals that aren't reused).

The targets under an EPR should also be individually applicable to each producer, or group of producers, rather than targets for the country as a whole. The targets should be formulated as shares by weight of new textile products put on the market by the producer, or group of producers.

Producers should be allowed under legislation to fulfil the targets for which they are responsible individually or to pay an accredited Producer Responsible Organisation (PRO) to ensure that targets are fulfilled.

PRO accreditation

EPR legislation should include minimum requirements for accreditation of a PRO and its planned activities. This should allow the relevant national authority to accept or reject an application from an organisation to be officially recognised as a national operating PRO. These could include:

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[2] http://www.naturvardsverket.se/upload/miljoarbete-i-samhallet/miljoarbete-i-sverige/regeringsuppdrag/2013/etappmal2013forslag/etappmal2013forslag-textilavfall.pdf

- The PRO is a non-profit organisation.
- The PRO commits to prioritising reuse before recycling as far as possible.
- The PRO commits to prioritise recycling back into fibres for new textile products before down-cycling (into industrial rags, insulation materials etc.) as far as possible.
- The PRO charges the producers which are its members a fee per unit new textiles which the member puts on the market. The PRO establishes a system for review of this fee to ensure it is sufficient to cover its financial obligations and to meet the targets for collection, reuse and recycling set in the regulations.
- The PRO gives a fee rebate to those producers who can document that they have collected post-consumer textiles or unsold textiles themselves and sent these to sorters for subsequent reuse and recycling.
- The PRO also offers a fee price rebate rate for items that through design improves the reuse and recycling of the textiles. Such criteria could include verified levels of specified chemicals, minimum recycled content and/or use of organic fibres, etc. Existing systems facilitating verification should be used for verification purposes to the level possible. These include relevant eco-labels. (See earlier for a discussion on which upstream effects may be most appropriate for inclusion in an EPR).
- The PRO invites existing collectors of post-consumer textiles (municipalities, charities and collection businesses) to become operators within the scheme.
- The PRO establishes a minimum buying price for collected textiles from the operators. This price should guarantee that the targets set in legislation are reached. *Alternatively* the PRO provides financial support to sorting companies per tonne of used textiles that they have received from operators in the system and subsequently sort for reuse and recycling. Sorters eligible for support could any sorter or be limited to sorting facilities lying within national borders.
- The PRO establishes (at a minimum funding level) a fund to support R&D on recycling technology, capacity-building activities for design for reuse and recycling etc.
- The PRO provides financial support to municipalities for awareness-raising campaigns.
- The PRO reports annually on quantities collected, exported, reused and recycled, plus financial statements. The legislation or connected regulations should define what the documentation should include and define calculation and verification methods.

The legislation should allow accreditation to be given to more than one PRO in parallel to allow competition.

The legislation should also stipulate:

- Penalties for non-compliance of PRO with the targets and for free-riders among the producers (7% of eligible producers in the French system).
- A maximum time period over which a PRO enjoys accreditation before it has to reapply for accreditation.
- Establishment of regular review process – this would define a regular (say two or three-yearly) review process for targets, scope of textiles covered and criteria for accreditation of PROs.

Member fees to PRO

The producers should pay an annual fee to an accredited PRO, based on the previous year's quantity put on the market multiplied by the size or weight of each item. In the French system there are 4 size categories for clothing and linen and 2 for footwear. However, Nordic systems could use other categorisations.

The legislation should allow the PRO to decide on the fee rates per item for producers that will enable the PRO to meet its targets and cover its reporting and other obligations etc. The targets for the PRO should relate to the quantities of relevant new textile products that *its members* have placed on the market. This allows for more than one PRO to be accredited within a country.

Fees in the French Eco TLC system vary between 0.1 to 4.5 Euro cents, being on average 0.5 Euro cents per item.

As specified under PRO accreditation above, rebates should be given to producers for post-consumer or unsold products that they have collected themselves for subsequent reuse/recycling.

Rebates should also be offered for some products which have included environmental concerns in their design and production. As a minimum these should include rebates for products with a minimum recycled fibre content but could also include rebates for other characteristics i.e. products accredited with recognised eco-labels such as the Nordic Swan, the EU flower or using the criteria for chemicals in the Higg index.[3]

[3] http://www.apparelcoalition.org/higgindex/

Contracts between the PRO and operators

The PRO should negotiate contracts with operators and producers that collect the textiles. Producers or operators that have contracts with the PRO will be responsible for providing collection points/facilities, picking up the textiles and ensuring that these are treated in accordance with the contract with the PRO.

The *operators* i.e. collectors/sorters under contract with the PRO, may include both charities and private businesses already dealing with textile recycling and/or the collection of other recyclable materials. They could also include municipalities. The accreditation criteria for the PRO could potentially specify that all legal, reputable collecting organisations should be invited by PROs to become registered operators.

If the operators already collect textiles, they can continue to use and expand on existing collection points. Operators may also decide to coordinate the collection of textiles with collection of other recyclables or to develop a new separate collection system.

Registered operators must not refuse textiles which are not reusable, and must make it clear to citizens that all textiles are accepted. Each year, the producers and operators should also report to the PRO the quantity of textiles set on the market, the quantity recycled and the quantity reused through the EPR system.

As identified previously there are two options for compensating or supporting the additional collection and reporting activities of operators to ensure that they are not negatively affected but can instead be strengthened by the EPR scheme. They could support the collectors per tonne of post-consumer textiles they collect, or they could support the sorting companies for every tonne they receive from operators and subsequently sort for reuse and recycling.

Either system needs to be supported by solid documentation which follows textiles through the system to avoid loopholes. An obvious loophole would be where used textiles are transferred from other countries to the Nordic country with an EPR, in order to receive payment from the PRO. Careful design of the legislation and system it implements is needed to avoid such loopholes.

Information

Municipalities may be best placed to distribute information to households but the PROs/producers could potentially be responsible for developing the information. The PROs/producers and/or others could also be responsible for distribution.

This information should make the need for collection clear and communicate how and where used textiles should be delivered. If it is the municipalities distributing information they would need to be financially compensated by the producers/PROs as with the French system.

2.4.2 A chemicals tax on textiles

To support an EPR regulation there is an option for an additional regulation (which is not part of the EPR) which establishes a tax on the production/import of textiles products that contain more than 0.1% highly fluorinated substances, biocides or phthalates in order to reduce the amount of chemicals in textiles. A nominal value of 20 SEK/kg of product might be an appropriate value.

It is possible that the European regulation for Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) in the future can phase out particularly hazardous substances in textiles. But at the moment REACH is a too cumbersome and slow to regulate chemicals in textiles and it is considered inadequate at phasing out particularly hazardous substances (Wallberg, 2014). The process to make a substance classified as particularly hazardous is extremely long.

In such a situation, it may be appropriate to use economic instruments in order to start or accelerate the phase of a substance. An environmental tax, such as a chemicals tax will enable the Nordic countries to move faster than the rest of the EU (i.e. not to wait for REACH to be improved) to phase out or significantly reduce the use of hazardous substances. A chemical tax can also push for substitution and innovation in the chemical field, which also could pave the way for restrictions on more substances at EU level (Kemikalieinspektionen, 2013). The chemical tax is intended to speed up the phase out of hazardous substances in textiles within a relatively short time span, in contrast to the slower approach in Reach. In addition, a chemicals tax will improve price signals in the market, by embedding the costs of environmental and health effects of the price of the item.

Within the research programme Towards Sustainable Waste Management, a chemicals tax was investigated as a way to reduce hazardousness of the waste (Malmheden & Ekvall 2012). It was identified by stakeholders, policy-makers and researchers as one of the most interesting policy instruments to assess. However, the specific construction of the tax assessed (2 SEK per kg of hazardous substance) made the instrument too blunt to be effective. The chemicals tax that is included in Policy package 1 is much sharper. It is designed to have a significant

impact on the production cost of textile products that include hazardous substances.

As already noted some industry representatives in the extended Reference Group consider a tax on chemical content in textile products to be prohibitively bureaucratic and costly to administer. This will be considered further in the evaluation of the policy proposals in chapter 7.

2.4.3 Review of rules on establishment of collection containers (see also Textile project 1)

A further supporting action to the EPR would be to review guidelines for municipalities on how to determine which collection organisations may set up collection containers on public land. Criteria that could be considered are:

- Only organisations that are contracted operators of an accredited PRO to be given have the right to use public land for collecting textiles.
- The organisation must communicate clearly that all types of textiles including worn out or soiled textiles can be delivered to the container.
- The organisation must report on the final destination of collected textiles (the PRO can be seen as a final destination).

2.4.4 Adjustment of legislation on ownership of waste

In Nordic countries household waste is legally owned by the municipalities. Most countries give dispensation for used products which are donated for reuse. However, this dispensation often only covers donations of products that are directly fit for reuse, but not for used products which are only fit for recycling. Dispensation may also only be applicable to donation to certain kinds of organisations e.g. charities.

In order to meet ambitious targets producers and PROs need to be sure that they and the operators registered within the system are legally able to collect both reusable and non-reusable textiles.

In association with establishment of EPR regulations in a country, the national regulations concerning ownership of post-consumer textiles would need to be reviewed and possibly revised to allow smooth operation of the system. The same is true for the status of unsold clothing by retailers.

2.5 Roles and relationship between key actors

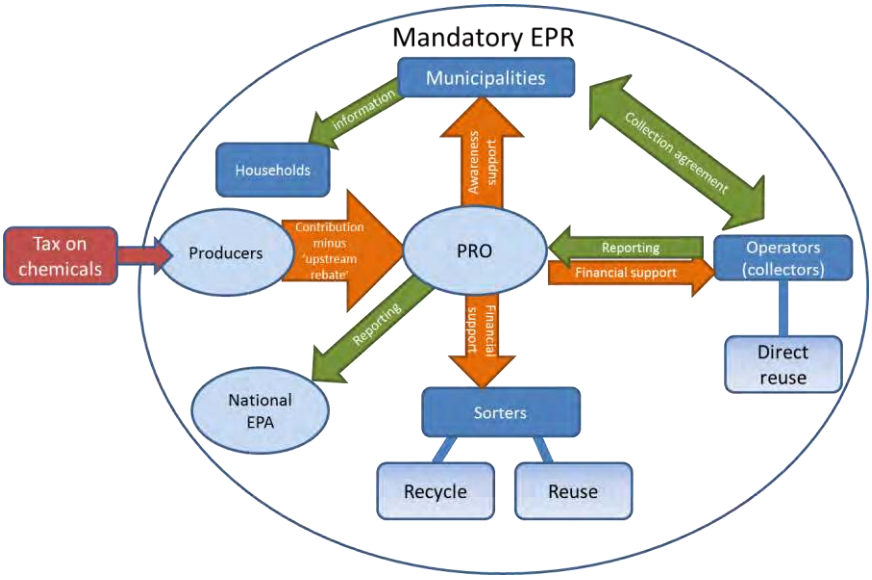
There are seven main types of actors that have responsibilities within this scheme: the administrative authority, the Producer Responsibility Organisation (PRO), producers, operators, sorters, the municipality, and private households. The figure illustrates the connections between different actors that are targeted by the different policy instruments.

The *administrative authority* would be responsible for ensuring that the EPR legislation is implemented and adhered to. They would have responsibility for 1) evaluating and awarding applications from eventual PROs or individual producers setting up their own system 2) ensuring that the PROs adhere to their obligations 3) administering penalties to PROs that don't meet their obligations 4) administering penalties to free riders (producers that don't contribute to a PRO or establish their own accredited system).

The administrating body might be the Ministry of Environment or the Agency. However, experiences with administering other EPR systems such as that for waste electrical equipment WEEE have demonstrated that the administering body should have a thorough understanding of commercial law including law on monopolies (DPA system, pers. comm.). This might rather suggest the Ministry of Enterprise/Business as the administrating body.

The PRO will negotiate contracts with *operators* e.g. municipalities, charities and businesses that collect post-consumer or unsold textiles. Operators that have contracts with the PRO will be responsible for establishing collection points for textiles and to see to that these are treated in accordance with the contracts with the PRO and for reporting on flows of textiles to the PRO. The PRO will be responsible for reporting on total volumes of new textiles put on the market by their members, and total collection, reuse and recycling volumes and rates to the administrating body.

Figure 1. Illustration of the connections between different actors in Policy Package 1



The PRO will also demand fees from *producers* according to the total quantities of different types of new textiles put on the market. The producers will also be responsible for paying chemical taxes should that instrument also be implemented.

The *municipalities* may be responsible for distributing information to *households,* with financial compensation from the PRO. Alternatively PROs/producers or operators may decide themselves to develop and distribute this information.

The *sorters* will sort textiles for reuse and recycling, potentially also with financial support from the producers. Lastly, *households* have a responsibility, though in the first instance not an obligation, to engage in the recycling system for textiles as they have done for other products, to increase the collection of textiles.

3. Policy package 2 – Voluntary collective EPR, possibly in combination with raw-material tax and recycling certificates

3.1 Goals of PP2

Similarly to PP1 the key goal of PP2 is to establish an EPR system which increases the share of new textiles put on the market which, following end of use by the original owner, is separately collected and made available for reuse and, where reuse is no longer possible, for recycling.

However, unlike the package under PP1, the package under PP2 is aimed at establishing an EPR system, and increasing collection of post-consumer textiles, via voluntary agreement rather than by regulation.

Similar to PP1, the goal of PP2 would also be to build on existing collection systems as far as possible rather than reinventing the wheel. This would reduce remove the risk of the undermining the work of important charities and would also be a more cost effective means for establishing a system.

Since PP2 does not establish mandatory obligations to collect and re-use/recycle textiles, further elements may be necessary to provide economic incentives for producers and other actors to engage in collection. There is already a strong market for reusable clothing but the market for textiles for recycling is much weaker. Therefore further goal of PP2 is to strengthen markets for recycled fibres. PP2 should avoid, however, strengthening markets to the extent that recycling is preferable to reuse.

3.2 Overview of the package

Voluntary initiatives are typically introduced by the producers themselves or via negotiated agreements with government, driven by pressure from the market. These pressures can include customer demand, demand from other producers, a wider stakeholder group, increasing prices on raw materials etc.

Voluntary initiatives may be more or less formalised and in some countries they can be combined with binding contracts and sanctions for the case where agreed targets are not reached.

In this policy package we combine a voluntary EPR with a combination of raw-material tax and recycling certificates. This package is based on the idea that instruments that increase the demand for recycled and reused textiles might increase the likelihood that a softer, voluntary approach to collection and sorting will prove to be effective. However, the voluntary EPR can also be introduced separately, without either raw-material tax or recycling certificates.

The policy package elements are described in more detail under section 3.5 following an introduction in 3.3 and 3.4 to some of the considerations that have been taken into account when designing the policy package.

3.3 A voluntary EPR system

The voluntary agreement should include targets for collection, reuse and recycling (see targets for mandatory EPR under PP1). However, under PP2 these targets will not be strictly binding. Instead we propose that the targets are included as part of a Voluntary Commitment which is drawn up by actors in the textiles industry encouraged by government (and the Nordic Council of Ministers) and to which actors subsequently sign. The voluntary commitment would be supported by codes of conduct for different kinds of actors (see later).[4]

Signatories will be motivated by CSR considerations and administrative advantages. A further incentive would be to avoid the regulation of a mandatory EPR. But perhaps the most important long term incentive for pro-

[4] This concept follows closely the concept being developed under a separate Nordic Council of Ministers project "The Nordic Textile Reuse and Recycling Commitment".

ducers would be to better enable them to secure supplies of fibres which can substitute virgin fibres.

The scope of textiles covered by the voluntary agreement could be the same as proposed under the mandatory agreement in PP2 i.e. clothing and home textiles. Alternatively, the scope could initially begin on a smaller scale i.e. uniforms. Since large quantities of all types of clothing are already collected, however, a commitment on the full scope seems appropriate.

The targets could also be indirectly promoted by complementary measures as outlined below. A review process for targets should also be put in place.

An important element of the voluntary system is how various actors cooperate, in particular how the collection activities are coordinated with municipal waste management systems. Coordinated communication efforts to citizens and organisations that generate textile suitable for reuse and recycling is also an essential part of such systems. Finally, a system of monitoring and reporting the results of the voluntary EPR system needs to be established.

A voluntary EPR system can be national, but it can also be a common Nordic system or at least elements of it could such as the Voluntary Commitment and code of conduct for producers. Other elements such as Producer Responsible Organisations (PROs) could also operate Nordic wide or nationally.

3.4 Measures to stimulate demand for recycled fibres

This policy package introduces complementary measures to the EPR system itself that focus on strengthening the market and demand for recycled textiles. The global market for reused textiles is already strong but the market for recycling of textiles, and in particular closed loop recycling is very weak (see Nordic Textiles Project 2).

A combination of raw material fees and recycling certificates are proposed. Raw material fees and recycling certificates are examples of economic instruments that aim to increase demand for recycled materials.

The concept of *recycling certificates* is that these would be issued to producers/importers that use a certain amount of recycled materials in new products can get a certificate issued, equal to the weight of the recycled materials used. The government determines a quota on the user side, which indicates the share of the total material usage that shall be based on recycled materials (Ekvall & Malmheden, 2012).

Producers that use less than the required share of recycled material will have to buy certificates from those with an excess. This will create a market where certificates can be bought and sold, similar to renewable electricity certificate system that steers towards increased production of renewable energy in Sweden (Ekvall & Malmheden, 2012) Norway and the UK.

Experiences with renewable energy certificate markets in Sweden and Norway are that a well-designed certificate based-system can be a cost effective ways of incentivising market actors (Ekvall & Malmheden, 2012). With a good market design targets can be reached at a low socio-economic cost. But the system needs a well-organized administrative and monitoring body.

For textiles the certificate trade would generate additional revenue to those who recycle materials. Note that the producers would not get certificates for collecting used textiles and sending them for recycling. The basis for certificates would instead be the quantity of recycled fibres in new textiles put on the market.

By introducing recycling certificates, incentives are created for better resource management, while the use of recycled materials becomes more economically justified. Furthermore, it guarantees that a certain percentage of the market consists of recycled materials, which stimulates increased use of recycled materials in the Nordic countries. The certificate system also forces producers to be more efficient because it leads to textiles becoming more expensive in Nordic countries, which in turn reduce the amount of waste (Ekvall & Malmheden, 2012).

Because only a small proportion of textiles consumed in the Nordic countries is produced there, a system for recycling certificates would also need to apply to imported textiles (products put on the market included), i.e. both producers and importers in the Nordic countries. Otherwise there is a risk that the competitiveness of Nordic manufacturers weakens compared to the rest of the world. There are likely no legal barriers (e.g. EU trade regulation) for this, considering the similarities to the Swedish certificate system for electric power, but this may need to be investigated further.

Producers consulted on the draft policy packages have responded negatively to the prospect of a recycling certificate scheme. Their arguments are that the scheme would be difficult to administer due to the many types of fibres and blends of fibres being used in textile products. This raises the question of whether the taxes should be applied per tonne of virgin fibre independent of the fibre type or whether it should be dependent on the relative environmental impacts of pro-

ducing that fibre. The former would be much simpler to apply but would be harder to justify.

Bureaucratic complications are foreseen with administering such a tax, particularly in the case of administering the tax on imports. These issues will be examined in more detail in the coming evaluation report.

A further problem with a system for recycling certificate is that the price of the certificates is difficult to foresee and might be draconic. This risk becomes apparent when there is insufficient capacity for recycling. This can be the case for textiles, since the technologies for recycling textiles into textiles is not mature. In addition the supply of recycled materials is mostly price insensitive. This means that the price of the certificates can become very high and have serious consequences for the textile market. A high price could also risk prioritising recycling over reuse which would not be environmentally optimal.

To avoid excessive certificate prices, the certificate system should allow producers to buy themselves free from the obligation to buy certificates. In effect, this would give producers a choice between paying for certificates and paying *a raw materials fee*. The level of the fee would be fixed and form a ceiling for the price of the certificates. The price of the certificates would never become higher than the fee, because that would make producers pay the fee instead.[5] The producers who do not possess a sufficient number of certificates can pay the raw material fee and buy themselves free from the certificate requirement. This would give a degree of flexibility for the producers.

In addition, by using a raw material fee instead of a tax, the revenues generated can be ring-fenced for use within the same sector for e.g. technology development instead of being redistributed to other sectors or for other purposes.

An efficient market also requires good access to information about the supply and demand. An efficient flow of information between suppliers and buyers might be established through a web-based material exchange site, which would allow sellers to find a wider number of producers and producers to sell products that usually are not sold in shops. This would be similar to the Material bank found in Finland (Mpankki, 2014).

[5] This is a more flexible solution than a simple price cap where demand of certificates might exceed supply.

3.5 Policy instruments

3.5.1 Voluntary EPR

The voluntary EPR would build on a voluntary commitment by all types of actors in the textile chain with a code of conduct for post-consumer actors such as collectors, sorters, recyclers and reuse traders with criteria for a legitimate management of end of life textiles whether for reuse or recycling.

Such a Voluntary Commitment is already being drawn up under another NCM project (Palm *et al.*, 2014b). The VC would be supported by specific codes of conduct for the various groups of actors involved in the textile chain.

A logo for the Voluntary Commitment (VC) would be created which the signatories can then advertise on all their products. This provides one incentive for signing up to the VC. Other incentives would include potential for securing fibres in a case of increasing virgin material prices and links to commitments made in a company's CSR policy. However, it cannot be expected that all eligible businesses/organisations will sign up to the VC. And unlike PP1 no sanctions would be possible for free-riders under PP2.

Each national EPA would initiates negotiations with and among the producers to help them reach an agreement on a Code of Conduct (CoC) for producers/importers who are placing new textile products on the market. It is suggested that the VC covers a minimum scope of clothing and home textiles i.e. products under the two digit CN codes 61 and 62.

The VC would include targets for collection (as share of textiles put on market), reuse (as share of the collected textiles) and recycling (as share of the residuals that aren't reused).

The CoC would consist of actions for producers, which would enable them to contribute to these targets. The CoC would also include rules for interaction and reporting to local and national environmental authorities.

It is suggested that in the negotiations for the drafting of the CoC, emphasis is placed on developing an EPR system which builds on existing and new collectors systems by charities and other organisations. Similarly to the mandatory system under PP1, one or more Producer Responsible Organisations (PROs) could be established. However under PP2 the PROs would be established and accredited by the producers themselves and not by government. The PRO would then manage contracts and payments to collecting organisations.

The CoC like the Voluntary Commitment should prioritise reuse over recycling in accordance with the waste hierarchy. The system put in place under the CoC should ensure that this commitment is adhered to. The CoC would require that signatory producers contributed to the PRO (if that route is taken by producers) as necessary such that the PRO could financially support the downstream actors to ensure that the collection, reuse and recycling targets in the VC are met.

The CoC could also commit producers to reducing the use of harmful chemicals in new and recycled textiles

Such a solution can be managed on a Nordic level by an independent body as well as on a national level.

A commitment that builds on current collection systems can be a low cost solution for producers while creating job opportunities in the entire postconsumer textile chain. It can also with its possibility of being implemented at Nordic level decrease the number of different systems for the producers and importers to manage, thus reducing overall administrative cost. Overall it is important to choose a system design and take measures that reduce the administrative costs and other forms of transaction costs for producers.

Agreement with municipalities should be made in order to coordinate information to the citizens about the need for collection and the practicalities surrounding the collection, in particular, the availability of collection sites. Moreover a review of waste ownership rules should be carried out (see under 3.5.4).

3.5.2 Recycling certificates and raw-material fee

A system of recycling certificates is initiated, which stipulates the use of a given percentage of recycled raw materials of verified quality in new manufactured or imported products. This percentage would be increased regularly (i.e. every few years) to encourage continual improvements.

Producers that use less than the required share of recycled material in a given year would be obliged to buy recycling certificates from producers that use a larger share of recycled raw materials. National authorities would issue recycling certificates to each producer in proportion to the weight of recycled materials they use.

Third party assurance of recycled content would be required to allow this system to function. The Global Recycle Standard (GRS) developed by Control Union and taken over by the Textile Exchange in 2011 would be the ideal system for providing this assurance.[6] The standard also providers producers themselves the assurance needed that the recycled fibres are free from hazardous chemicals.

Once issued, the recycling certificates could be freely traded between producers/importers within the Nordic countries to allow individual producers/importers to meet their minimum requirements for share of recycled materials in their products.

To avoid draconic costs, if the price of recycling certificates becomes very high, producers would be allowed to buy themselves free from the system of recycling certificates. They would do so by paying a raw-material fee. The raw-material fee would be a fixed price per kg of virgin material which otherwise should have been covered by certificates. The revenues from the fee will be used for stimulating the development of technology and market for recycled fibres.

As the technology for recycling and the market for recycled fibres become more established, the stipulated share of recycled material can increase and the back door, the option to buy themselves out via a raw material fee, can eventually be closed. A period should be selected after which point national authorities should review and potentially increase the stipulated share of recycled raw material as well as the raw-material fee.

As already stated, producers who responded to this consultation see significant bureaucratic complications with implementation of these instruments. These will be considered in more detail in the coming evaluation report.

3.5.3 Material exchange

The policy package also includes a web-based material exchange site for textiles, which would address both production waste, surplus and post user textile waste. This aims to allow for efficient flows of information between suppliers and buyers. The exchange site is initiated by national authorities but could potentially be taken over by private interests later.

[6] http://textileexchange.org/GRS

Proof of quality of traded recycled materials will be an important element of this exchange so that producers can be assured that the material does not include hazardous substances. The Global Recycle Standard (see above) could provide such assurance.

3.5.4 Adjustment of legislation on ownership of waste

As described under PP1 in Nordic countries household waste is legally owned by the municipalities and while countries give dispensation for used products which are donated for reuse, problems can occur with donation of textiles which are not suitable for reuse.

In association with establishment of voluntary agreements on EPR, the national regulations concerning ownership of post-consumer textiles would need to be reviewed and possibly revised to allow smooth operation of the system. The same is true for the status of unsold clothing by retailers.

3.6 Roles and relationship between key actors

The figure below illustrates the connections between different actors and how they are affected by the policy instruments. The *national EPAs,* possibly in cooperation with Ministries for business and enterprise, would initiate negotiations on voluntary agreements and codes of conduct for producers. They would also establish website for materials exchange (for possible commercialisation later). The *government and parliament* would initiate laws on recycling certificates and raw materials tax.

The voluntary EPR system might result in *producers* engaging in a system similar to that of the mandatory EPR with a central *Producer Responsible Organisation (PRO),* although this may not be necessary, hence the dashed lines concerning financial support in the figure below.

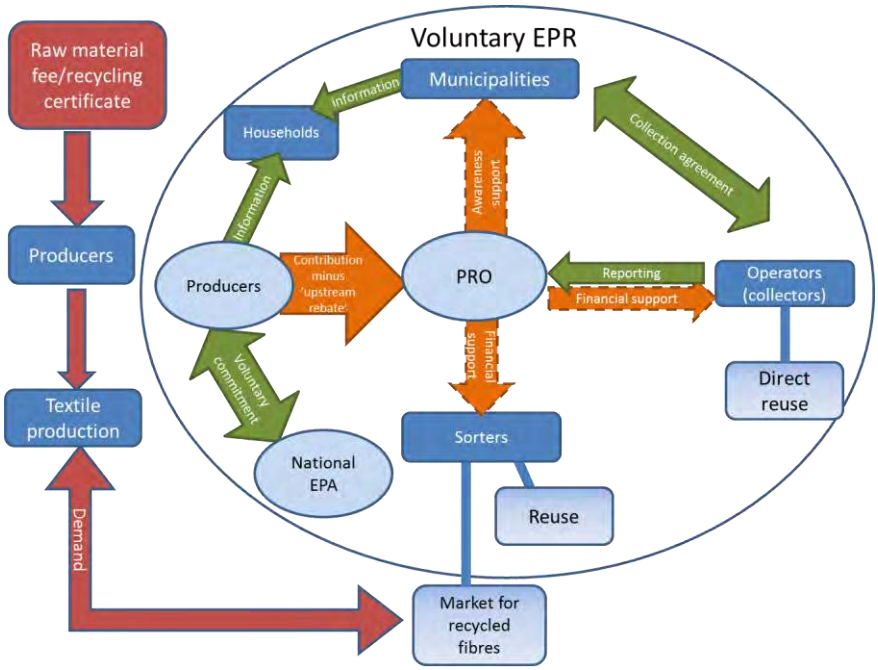
The PRO would negotiate contracts with *operators* i.e. charities, businesses and municipalities that collect the textiles. This can also be the producers themselves. Operators that have contracts with the PRO will be responsible for providing collection points, picking up donated/discarded textiles and to see to that these are treated in accordance with the contracts with the PRO.

As well as potentially acting as operators *municipalities* have in most cases responsibility for deciding who may set up collection containers on public land. They may also be responsible for distributing information to *households* about the need for collection and the practicalities

surrounding the collection. The producers themselves or other operators could also be responsible for developing and distributing this information. The *sorters* will sort textiles for reuse and recycling, also with possible financial support from the producers.

Should the recycling certificates and raw material fee regulations also be adopted the producers would also be responsible for buying sufficient certificates or paying fees. A third party assurance organisation would be required to check that producer's claims of recycled content in products are robust. The Global Recycle Standard would be the obvious standard to be applied by producers to support claims.

Figure 2. Illustration of the connections between different actors in Policy Package 2



4. Policy package 3 – New business models

4.1 Goal of PP3

Policy package 3 focuses on establishing and supporting some new (innovative) business models for textile products (mainly clothing) that were identified and evaluated in Phases 2–4 of this NCM project. *The business models all have a goal of extending the active lifetime of textile products through reuse or otherwise, and/or at the end of life ensuring that the materials in the products are recycled as far as possible.*

The models include leasing, resell of used own-brand, clothing libraries, luxury second-hand shops, repair services and in-store collection of textiles by high street retailers with a sorting/reuse /recycling partner. A full list of models can be found in the first report in Watson *et al.* (2014).

While many of the models have elements of extended producer responsibility, all of them are run by individual businesses and *not at a collective level*. The measures included in PP3 should therefore not be interpreted as supportive measures for the collective EPR systems promoted under PP1 and PP2. The measures in PP3 are rather aimed at helping individual businesses.

The business models mapped out in Watson *et al.* (2014) are very diverse covering many different concepts and ideas. However, in the second report in Watson *et al.* (2014) a number of common obstacles to the success of these diverse models are identified. Therefore, there are policy options which potentially can support several of the models.

The goal of this policy package is *to propose policies that would have the effect of supporting several of the individual business models.* This would include policies which improved the framework conditions within which all the models operate. It also includes targeted support to aid start-up and establishment of models which have the potential to be economically viable in the long term. In addition, establishment and running support could be provided to social innovation models which do not have business potential but can provide overall benefits to society by extending active lifetimes of textiles and increasing reuse and recycling of textiles in the Nordic countries.

Since there are many different options for policies and activities that can improve framework conditions and provide support to new business models, *Policy Package 3 should be perceived as representing a pool of policy options from which NCM and Nordic governments can make selections.*

4.2 Common challenges

The first step in identifying policy options is identifying current obstacles to viability and spread of relevant business models. These were identified in the second report in Watson *et al.* (2014):

4.2.1 Lack of quality

All of the business models would be strengthened by an increasing quality and durability of textile products. This is because in each model the economic viability is raised if the textile products which form the core of the model can tolerate long active lives and many laundry cycles without losing their appearance or functional qualities. In some cases, such as leasing of own brand and resell of own brand, the business themselves can ensure the quality of the products which are leased and resold. For other models – leasing by third parties, clothing libraries, in-store collection with partner, luxury second hand and also more general second-hand businesses, online resale sites etc. – the viability and the potential market share of these business model is entirely dependent on good quality clothing and textiles being produced by the textiles industry. In general, the higher the average quality level the greater the potential size of reuse markets.

There is thus also need for policy which encourages or demands an increasing quality and durability or potentially provides information that certain quality levels have been reached for a given product.

The pool of policy options therefore includes:

- *Financial assistance and demands for inclusion of sustainable design courses in design schools.*
- *Label (Nordic Swan, Higg Index or otherwise) with durability information/criteria.*
- *Minimum warranty periods for (certain types of) clothing/textiles.*

4.2.2 Lack of awareness and resistance to change

Traditional concepts of how textile products are marketed and offered to consumers were also identified as a common barrier. This concerns both how producers view their role in the market place and how consumers view their options for obtaining and disposing of products. Challenging the current linear models and raising awareness of alternatives amongst both consumers and producers is crucial for the successful spread and nurturing of innovative models. For a number of models citizens have a dual role as both the supplier of materials (i.e. used textile products) and demanders of the products or services (i.e. second hand or leased products). Both roles can be essential for the business model to flourish. More communication and capacity building on these new business models is needed, in order to secure a wider and more stable demand and supply.

The pool of policy options includes:

- *Knowledge hub and advice bureau for start-up of new business models.*
- *Nordic awards for new business models in textiles.*

4.2.3 Challenging price differentials

Many of the models rely on local labour to provide the services included in the model. This includes for example receiving and partial sorting services (all models), repair and laundry services (repair, leasing, clothing libraries, resell of own brand, luxury second hand) and thorough sorting services (charity second hand, in-store collection with a partner).

Due to the relatively high wages in Nordic countries and in Europe compared to low labour costs in Asia where most new textile products are produced, it is hard for many models to compete with the low price of new textiles. For example, repair based business models currently only make economic sense for more expensive higher quality items such as quality dresses, suits, etc.

The cost differences can potentially be improved through removal or reduction of VAT for the services and products of these models i.e. second hand goods, repair services etc. A more far-reaching but controversial measure would be to increase the price of new textiles, either via encouraging a drive towards higher quality (see earlier) or via economic instruments such as resource taxes.

In addition or as an alternative, governments can provide targeted financial support to the more promising models to cover start up and marketing costs, but in some cases even running costs.

The pool of policy options includes:

- *VAT reductions/removal for second-hand goods and repair services (and leasing?).*
- *Government funding pool for start-up investments in new business models within textiles.*
- *Support for second hand shops in selected locations.*
- *Long term unemployed wage subsidies earmarked for sustainable business models plus tax benefits for social enterprises.*
- *Resource tax on new textiles.*

4.3 Pool of Policy Instruments

4.3.1 Encouraging higher quality more durable products

1. *Financial assistance and demands for inclusion of sustainable design courses in design schools*

As has already noted the design of textile products are important in relation to business models where the lifetime of the products in general are increased. Design for durability and for repair is therefore crucial. The designer's role and power varies and is very different in different companies, which affects both the working method and the decisions.

In some companies, such as Klättermusen, BOOB and Katvig, the designer has overall responsibility for the collections. This means that designers make all decisions concerning form, function and materials and other details, as well as acting purchaser of materials and can thus influence the production processes and treatments that textiles must undergo. In larger companies the designer's role is more limited and the main function may be to perform custom orders on behalf of, for example the purchaser who is responsible for the collections. In other words, the purchasers are the ones who make many of the crucial decisions that affect product design, material selection and which treatments are desired.

Focus on more sustainable textiles and textile products are therefore necessary for both designers and purchasers. This goal might be reached with better education.

The inclusion of sustainable design courses in design schools is one potential means for equipping new designers with the necessary knowledge about how to design for longer lifetimes and subsequent recycling.

However, education should also reach out to designers and purchasers already employed by brands and retailers. This could also be provid-

ed by design schools offering professional training courses/seminars potentially making use of such tools as the Sustainable Apparel Coalition's Rapid Design Module (RDM) webtool.[7]

Policy instrument

The state provides earmarked financing of teachers and courses for design schools within the area of sustainable design and provides an action program on how this will be achieved. The state may in return demand a minimum level of credits within design education programs dedicated to sustainable design including design for durability and repair.

In addition part of the funding is specifically earmarked for developing and offering professional training days/courses for designers and purchasers working in brands/retailers. These could be promoted via trade magazines/ industry associations.

2. *Label (Nordic Swan, Higg Index or otherwise) with durability information/criteria*

A label which assured purchasers of a minimum level of durability of a textiles product would aid a number of the business models in selection of suitable products to be at the centre of the model. Examples would be clothing libraries, third party (i.e. not own brand) leasing and luxury second hand where it is key to make use of products which can tolerate a hard level of active use, a large number of laundry/cleaning cycles etc. It is important that this label is permanent and not just on the products original packaging i.e. is part of the products care label or otherwise.

The Nordic Swan criteria for textiles products already include minimum criteria related to a product's "fitness for use". These include:

- Requirement that dimension changes above a certain percentage (different for different types of products) during washing or drying must be explicitly stated on the care label and packaging or on a product information label.
- Minimum standards for colour fastness under different actions: washing and perspiration, wet rubbing; dry rubbing, and; exposure to light.[8]
- Standards for pilling resistance (furniture fabrics only).

[7] http://www.apparelcoalition.org/tools-faqs/product-tools/what-is-the-rapid-design-module-rdm-beta.html

[8] http://www.ecolabel.dk/kriteriedokumenter/039e_4_0_1.pdf

The guidelines also specify testing methodologies needed to ensure that the requirements are met. These to a certain extent meet the needs of business models such as leasing, clothing libraries, luxury second hand etc. in that it provides some assurance of the quality of the product. However, since the dimension change test includes only three wash cycles the label doesn't really provide assurances about the *durability* of the product. Similarly, for colour fastness tests only a single wash is required.

To provide assurances of durability the tests would need to be extended to include a greater number of wash cycles. The communication of the eco-label may also need to be developed so the care label includes information on how many times the product can be washed without exceeding maximum dimension/colour changes. These can then potentially be used as a blueprint for similar developments in the EU Flower or at the more global level as one of the performance measurement criteria of the Higg Index.[9]

The Higg Index is a group of measurement and design tools being developed by the Sustainable Apparel Coalition to aid brands and manufacturers to measure the environmental and social performance of their production facilities and their products. The eventual aim is to use the Index in communicating environmental and social performance of brands and their products to consumers. Durability scores could be included as part of this communication. Given the global marketplace for textile products, brands generally find eco-labels with global recognition far more appealing than regional labels such as the Swan or even the Flower.

A further alternative is to develop a durability specific label, which identifies the number of wash cycles a textile product can tolerate without exceeding minimum shape and dimension changes and colour loss. In addition to wash, other functions such as quality of buttons, zippers, blend of fibres which determine product's quality and functional durability. However, again this would best be developed with global markets in mind.

Policy instrument

The development of durability criteria and testing methods for inclusion under the "fitness for use" area in the Nordic Swan list of criteria for clothing, textiles and leather products. This should include maximum dimension and shape changes and colour loss following a given number of washes but far beyond the 1–3 given in the current criteria. Alternatively it could include requirements on the care/purchase label for all products sold in

[9] http://www.apparelcoalition.org/higgindex/

Nordic countries on the minimum number of wash cycles the product can tolerate before minimum shape and dimension changes are exceeded. To be significant in the marketplace this model would need to be adopted by the EU-flower and the global Higg Index.

A further alternative is to develop a durability-specific label for Nordic countries which follows this minimum number of washes communication concept. This would have a much larger effect since the market share of Nordic Swan labelled textile products remains very small.

3. Minimum warranty periods for (certain types of) clothing/textiles

If consumer protection law is strengthened so that producers were made more responsible for defects but also ordinary wear and tear in textile products this could have the effect of increasing the general quality and durability of products put on the market. This would improve the framework conditions for business models concerning the reuse of non-own brand textiles i.e. all second hand clothing and textiles businesses, clothing libraries, in-store collection with partner etc.

EU Directive 1999/44/EC concerning guarantees for consumer goods makes producers responsible for "faults" in any consumer product up to two years after the purchase date.[10] Importantly the Directive states that "In some countries, this may be more, and some manufacturers also choose to offer a longer warranty period". In other words giving individual EU countries the freedom to extend but also further strengthen the terms of the guarantees.

According to the Directive the seller must provide goods which among other things "show the quality and performance which are normal in goods of the same type and which the consumer can reasonably expect, given the nature of the goods". This is difficult to interpret in the case of clothing and textile products and different countries transpose the Directive into national law in different ways. In the equivalent UK law, for example, for the first six months after the purchase, it is up to the retailer to show that a fault on an item is down to the actions or misuse of the buyer, rather than an inherent fault in the product. However, after six months, the burden of proof switches to the buyer and it is they who must then show a fault is due to some inherent problem.[11] This is

[10] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31999L0044:en:HTML

[11] http://www.thisismoney.co.uk/money/bills/article-1677034/Two-year-warranty-EU-law.html

very difficult to prove and therefore in the UK the guarantee in reality only really has any value for the first six months.

It has not been possible in this project to investigate the way in which the Directive has been transposed into law in the Nordic countries, although in Sweden at least the law is similar to that in UK. It is suggested that the national EPA's or other bodies investigate the relevant law and consider means for strengthening it so that a longer (to be decided by governments) normal wear and tear guarantee for textiles products comes into force.

Policy instrument

National laws on consumer product guarantees which transpose EU Directive 1999/44/EC to be strengthened such that a functioning two year "normal wear and tear" guarantee for clothing and home textiles products comes into force.

4.3.2 Raising awareness and capacity building of new business models

4. Knowledge hub and advice bureau for start-up of new business models

When starting up a business it can be crucial to have the right knowledge, tools and guidance. A knowledge hub for start-up of new business models should therefore be available for all interested entrepreneurs in the entire Nordic region.

This type of scheme already exists in several of the Nordic countries. In Denmark the Danish Business Authority has established so-called "incubators" (Væksthuse)[12] for entrepreneurs who would like to start their own business. In the Væksthus entrepreneurs can obtain free assistance to make a business plan from professional and unbiased consultants and at the same time obtain access to a large network of entrepreneurs and business leaders.

What is important is therefore that updated knowledge on business models for second-hand businesses, leasing schemes, repair services and other business models that enhances re-use and recycling (of textiles) is available.

[12] http://startvaekst.dk/

Policy instrument

Equipping existing knowledge-hubs for green innovative businesses with knowledge and resources in the field of new business models for textiles so that they are able to assist entrepreneurs in this area. This would include information on existing green business models, information on start-up, available funding schemes (see later) and available national schemes for subsidised employees(see later). In the regions where they are not already present such knowledge hubs would be set up.

5. Nordic awards for new business models in textiles

Green business awards are one way of raising awareness of innovative business approaches both within the industry but also to a certain extent amongst the wider public. The Nordic Council of Ministers already runs a number of annual prizes under different types of themes i.e. film, literature etc. one of which is the Nordic Council Nature and Environment prize.[13] New types of business models are often included in the nominations for this prize but it would perhaps provide more focus on new business models if a new prize was specifically created within the area of Innovative Green Businesses. This would also fit well with the Nordic Council focus on green growth since 2010. Green business models for textiles could be showcased by such award events.

Policy instrument

Create a Nordic Council prize and connected websites, award ceremony etc. for Green Business Models as part of the Green Growth strategy implementation.

4.3.3 Improving economic and financial conditions

6. VAT reductions/removal for second-hand goods and repair services (and leasing?)

The reduced VAT on output (sales of either used or leased goods) or on services such as repair is an instrument which can prove beneficial for new business models.

Reduced VAT on second hand sales, leasing of textiles and textile repair services should to a certain extent increase the attractiveness of

[13] http://www.norden.org/da/nordisk-raad/nordisk-raads-priser/nordisk-raads-natur-og-miljoepris

these goods and services compared to new textiles on which the consumer pays VAT.

Although a VAT reduction is unlikely to reduce the costs of repair to an extent where it is economically preferable for all types of clothing to have them repaired, or to lease instead of buying, it provides a clear signal from the state to the general public. Moreover, in combination with the measures outlined earlier which improve the average quality and durability of textiles (and thus increase item price) leasing and repair may begin to become economically attractive for a larger range of products.

Policy instrument

Reduce VAT to the lowest possible level (depending on EU rulings) for all textile repair and leasing services as well as from the sales of second-hand and leased textiles (and other goods).

7. Government funding pool for start-up investments in new business models within textiles

In the start-up phase of new innovative and relatively untried businesses there will often be a need for external financing. In general secured and targeted financing will allow businesses to enter the market and get the business model started whilst having resources to focus more on developing and spreading the business model. In this respect, Nordic countries could consider being inspired by UK Defra's waste prevention programme for England which aims to improve access to finance for businesses via (amongst other things):

- *Improving information available to banks* to enable them to promote the business benefits of investment in resource efficiency, particularly for small and medium-sized businesses (SMEs).
- Establishing a *business bank* to support SMEs The Business Bank will bring together and build upon existing government schemes aimed at supporting access to finance for businesses under a single organisation. The bank has GBP 1 billion of additional government funding, which will be managed alongside GBP 2.9 billion of existing government commitments, and will be operational from autumn 2014.
- The *Waste Prevention Loan Fund,* managed by WRAP on behalf of Defra, providing GBP 1.5 million support to support waste prevention and reuse (DEFRA 2013).

The public direct support might not only work as a short-term financial shot, but can also serve as a seal of approval for future investors.

In Denmark the programme Grøn Omstillingsfond (Erhvervsstyrelsen 2014) for businesses wanting to engage in new business models supports consulting and a trial phase with a public pool. Where such programmes already exist in Nordic countries more emphasis could be placed on business models which encourage extended lifetimes, reuse and recycling of products including textiles.

Policy instrument

Establish a business bank which provides access to financing of business start-ups with venture capital, mainly targeted at SMEs.

Further, establish direct support for new business models via new or existing funds. Much like the Waste Prevention Loan Fund it should support businesses and social enterprises to develop innovative, more resource-efficient ways of doing business. Where such funds already exist for sustainable business models (as they do in most Nordic countries) more emphasis should be placed on innovative business models which increase reuse, repair and recovery capacity for products (including textiles).

Finally it is suggested that information about business benefits of investing in innovative business models should made available to investors and banks. This could be facilitated via networking and conferences organised by the knowledge hub described earlier.

8. Support for second hand in selected locations

For the mainstream consumer second-hand shopping can be less convenient than purchasing of new textile products. This is in part because second hand shops tend to be located outside the centralised shopping areas and shopping malls in cities. Svengren *et al.* (2010) found that the price of second-hand clothing is lower than the price of new clothes, but when the total purchasing cost (the sum of price, time, mental effort, energy and loss of alternative benefit) is considered the cost is higher. It takes time, money and energy to get access to the second hand stores. Moreover, because consumers have to look through a lot more clothes in order to possibly find something that fits and also meets their style needs, the opportunity cost and the mental effort increases.

This situation could be somewhat improved by locating second hand shops within central shopping areas, shopping centres and even regular high street stores. This will however often mean higher costs for the businesses which may not be supported by the business model. State support for running costs of second hand might therefore be necessary.

It is suggested that this support is open to both second hand dedicated businesses and charities but also to ordinary high street brands and retailers so they can be encouraged to begin selling second hand – either own brand or any brand. It is suggested to identify particular shopping centres and shopping streets within cities for which support can be sought per square metre. In order to include competition and keep costs down companies could bid for support in these areas with the support being awarded to the lowest bidder. The funds would best be administered by municipalities.

Policy instrument

Square Metre Scheme – State or municipal funds for support of rental payments for second hand clothing stores/sales areas in city centres, administered by city authorities/municipalities. Streets and shopping malls with particularly high consumer throughput would be identified and allocated as valid for support. Funds to be allocated via bidding rounds. Funds to be awarded to the businesses and charities asking for the lowest support per square metre up to a pre-decided total number of square metres for the city or up to the total funding available for the city. In that way the more competitive the bids the more total square metres of second hand sales could be supported. The bidding to be open to both dedicated second hand businesses and charities and high street retailers/brands. In the latter case the retailer would only receive support for that floor area dedicated to second-hand.

9. *Long-term unemployed wage subsidies earmarked for sustainable business models plus tax benefits for social enterprises*

Many of the new business models – especially those based on providing a service such as repair shops, redesign of used clothing, clothing libraries, leasing etc. – are rather labour intensive compared to traditional retail models. Moreover, these jobs often need to be situated close to the consumer which is good for green job promotion in the Nordic region, but can be a challenge to the viability of these businesses due to relatively high labour costs.

It could therefore be beneficial for business owners and entrepreneurs to get guidance and assistance in recruiting subsidised staff. The legislation is likely to vary in the Nordic countries, which is why it might be difficult to set specific goals for this area.

Subsidised employees can be organised by the municipality. In Sweden there is e.g. something called “Fas 3” where the Swedish Public Employment Service organises jobs for people that have been left aside from common working life over a longer time period. In Denmark people

who are not able to work full time due to illness might be eligible to work in a "Flexjob" which is partly supported by the municipality. A different possibility is to hire unemployed staff for a limited time with "wage subsidy" (løntilskud) in order to test the possibility of a permanent position.

A related measure would be to provide tax breaks for social enterprises employing long term unemployed. This would give further support to textile redesign shops etc. run by charities and social enterprises.

Policy instrument

As part of the knowledge hub described earlier advice should be provided for new business ventures on the various national schemes for subsidised employees and assistance with applying to these schemes provided.

10. Raw material fee on new textiles

The low price of new textiles, especially fast fashion, challenges business models based on repair, leasing, durability etc. Repair based business models currently only make economic sense for more expensive higher quality items such as quality dresses, suits, etc.

One means for tackling this in combination with reduced VAT on these models, has already been described under measures 1 to 3: increasing the average quality of clothing, and indirectly increasing price that way. A further method would be to more directly increase prices via a raw material fee as already presented under Policy Package 2.

The raw-material fee would be a fixed price per kg of virgin material in textiles sold on the national market. The revenues from the fee could be used for funding of new business models via the funds established under element 7 of Policy Package 3.

Policy instrument

Establish a raw material fee for textiles produced/imported to the country. The fee would be per kg of virgin textile materials put on the market.

Policy packages for supporting EPR and new business models: *Critical factors, risks and synergies*

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5. Introduction

Under this task of the project three policy packages were developed to support EPR systems and new business models which will extend the active lifetime of textile products, via reuse or otherwise, and increase recycling of products at the end of their useful life.

Three policy packages were developed:

- *Policy Package 1*: A package to establish and mandatory EPR and a tax on harmful substances.
- *Policy Package 2*: A package to establish a voluntary collective EPR system, plus a raw material fee and recycling certificate system.
- *Policy Package 3*: A pool of policies to support new business models which extend the active lifetimes of textile products.

The proposed packages are not necessarily mutually exclusive. Components from the different packages can interact in new combinations or function independently of each other. In particular, the measures identified in PP3 can be used in combination with either the measures PP1 or those in PP2.

The packages have been developed within the context of parallel Nordic Council of Minister's textile projects "The textile reuse and recycling commitment" and "A Nordic strategy for collection, sorting, reuse and recycling of textiles". Clear synergies have been identified between the different solutions investigated.

The aim of this task, was to identify and briefly analyse some key aspects of the three policy packages. Combined with the policy packages described in chapters 2, 3 and 4 this document should provide Nordic governments and other stakeholders with information on:

- *Types of policy* that can be implemented to support EPR systems and to support business models for extended use, increased reuse and recycling of textiles.
- *Risk elements* and *critical design elements* associated with the policy measures which will determine whether they succeed in achieving their goals.

- *Synergies and conflicts* between the various policy measures and packages.
- *Further assessments needed* prior to adoption of some of the policy measures.

The project does not prescribe any particular policy for any particular Nordic country but rather provides inspiration, guidance and information on different policies that could be considered by Nordic countries.

The sections on critical factors and risk factors have been written as bullet points to keep them short and to the point. Detailed texts describing the different policy packages are available in chapters 2, 3 and 4 in this report.

6. Evaluation methodology and criteria

The methodology used for evaluation has focused on highlighting the key aspects of the policy packages for key stakeholder and in particular for Nordic governments who may consider further assessment of one or more of these policy packages or their various parts as a basis for national policies and regulations.

The methodology consists of four steps:

- Identify *critical factors* of the policy packages which need careful design to achieve the policy packages defined goals.
- Identify *risk factors* connected to the policy packages i.e. how it may negatively impact on existing activities, actors or sustainability goals.
- Identify some *potential synergies and conflicts* between the three policy packages.
- *Recommend further studies* that could be helpful prior to adoption of individual policy components.

The evaluation is qualitative due to the limited resources of the project and is mainly based on the information provided earlier in the report.

Quantitative data from the evaluation in Watson *et al.* (2014) has also been used to aid the evaluation where relevant. The factors identified have been related to the goals of the different policy packages (as described at the beginning of each Policy Package in chapters 2, 3 and 4 of this report) as well as the key evaluation criteria of the green growth initiative: environment, economy and green jobs.

The evaluations have taken account of comments received from the extended Reference Group during the consultation on the policy packages: in particular comments concerning problems and obstacles associated with a given policy measure.

7. Policy Package 1: Mandatory EPR and tax on harmful substances

The evaluation of this policy package has been divided into separate sections for the mandatory EPR and for the tax on harmful substances with a final section on possible synergies and conflicts. See the details of the policy package earlier in this report.

7.1 Mandatory EPR

7.1.1 Critical factors

- The *collection, reuse and recycling targets* are the most critical design element of the EPR regulations. They should be ambitious enough to give significant improvements on current rates (which should be measured prior to setting targets) but realistic in terms of what can be achieved. Progress against them should be monitorable. Ideally, they should be based on shares of textiles put on the market rather than absolute volumes. Finally they should prioritise reuse over recycling.
- *Recycling targets* as well as fee structure introduced by (a) PRO(s) should take into account characteristics of different materials and development of sorting and recycling technologies.
- A *clear definition of what textiles are included* in the EPR and who can claim ownership of reusable textiles – under which condition the reusable textiles are considered to be within the EPR system – is needed since consumers still must be able to trade and swap these textiles.
- Municipalities who have been responsible for handling household waste have assumed *ownership of waste*. As found in the solution for EPR system for Waste Electrical and Electronic Equipment (WEEE) in Finland (Tojo and Manomaivipool 2011), national waste legislation in each country must clarify that the collected textile waste should be handed over to producers/PRO free of charge.

- For the *provision of a level playing field*, in addition to manufacturers and importers of textile products covered in the legislation, it is critical to include distant sellers. This is found in, for instance, the EPR-based WEEE Directive (Directive 2012/19/EU).
- Existing collectors of used textiles typically specify that only reusable products should be delivered to collection points (Palm *et al.* 2014a). Under a mandatory EPR citizens should be informed clearly that *all textile products – both reusable and non-reusable – are accepted*.
- To achieve collection targets enhancement of *convenience for citizens, coupled with ample information,* is of key importance. Care should be made to avoid the situation where collection effort is concentrated in urban areas and rural areas are dismissed. Local collection targets (e.g. as used for paper waste in Denmark, see Tojo 2008) and requirements on provision of convenience may ease the situation. Alternative ways of collection such as mail service collection could be considered for rural areas. This is already happening in Norway, where Fretex collects used textile products via mail (Fretex, 2014).
- National legislation should *allow individual producers to fulfil their responsibility alone or join a Producer Responsibility Organisation (PRO)*. Legislation should not favour the latter by, for examples, exempting the producers from fulfilling certain responsibilities by joining a PRO, as found in the implementation of WEEE Directive (van Rossem *et al.* 2006).
- A *power/motivation analysis* should be carried out before determining who should run a PRO. The composition of the board of directors of the PRO will be strongly influence whose interests will be most strongly represented (producers, charities, municipalities) and ultimately whether textiles are reused or recycled, and whether upstream effects (i.e. design improvements) are encouraged by the PRO or not.
- Various factors lead to *the formation of one or several competing PRO(s)* in a country. While the former has the advantage of simplicity, a monopoly often leads to higher cost for producers and creates oligopoly for operators. EPR systems for other products, such as WEEE, experience the monopoly PRO having "its own life", and it has been criticised that it may act against the interest of its members (producers). If several PROs a national clearing house could be formed as in the case of WEEE, to allow PRO cooperation.

- It should be up to the PRO(s) to decide *whether to offer monetary compensation for sorters or collectors* for their additional work (e.g. reporting, accounting). Who receivers compensation and how it is calculated can vary (two example were provided in chapter 2), and may require careful examination by the PROs.
- A differentiated fee structure for producers (see chapter 2), *should reward producers who make positive upstream changes to product design*. A high hurdle for such differentiation, as experienced in the field of WEEE, is to agree on criteria for differentiation. Conformity with criteria for established/industry-wide recognised labelling schemes such as Nordic Ecolabel or a HIGGs-index score could be one option.[14]
- *Engaging producers*, as new but crucial actors for management of used textiles, would help enhance their active participation during the implementation. Equally important is the participation of existing actors such as charity organisations and municipalities.
- *Inclusion of penalties against free riders* (producers who are escaping from their responsibilities) and responsibility for administering them, is a further key design element. Experiences in other product groups such as WEEE indicate engagement of PRO(s) to be a useful solution (Tojo 2004).

7.1.2 Risk factors

- The establishment of additional collection points by municipalities and business actors *may jeopardise collection by charity organisations* and undermine them financially. This should be avoided by encouraging them to be operators (both collectors and sorters) under a mandatory EPR system.
- However, over-emphasis on "protecting" existing actors may create *barriers for new actors to come into the market*. Being an existing actor should by no means pre-condition to be an operator in the mandatory system.
- Mandatory EPR system may be perceived to *undermine some existing business initiatives* – e.g. resell of used own-brand clothes. It should be possible to count the resold clothes as part of collection/reuse target achievements.

[14] http://www.apparelcoalition.org/higgindex/

- EPR systems have been criticised by some for *prioritising recycling over reuse.* Inclusion of reuse target would help to counter this. The risk of recycling prevailing over reuse would only happen if the market price for recycling increased several times over, which is considered unlikely.
- *Costs for charity organisations* due to increased administration and sorting and handling of more recyclable textiles might endanger their business if not compensated by the EPR system.
- There is a risk that *when targets are reached, collection will decrease or cease.* It must be made clear that the responsibility covers 100% of the waste stream and not only up to a certain target. In addition targets should be constantly reviewed in order to provide constant motivation for improvements.

7.2 Tax on harmful substances

7.2.1 Critical factors

- Which chemicals to include is a critical issue and initially only a few should be chosen and possibly expanded after further investigation.
- The level of the tax will be difficult to set and could therefore start at a low level and be subsequently increased to find an effective level.
- Administration of the tax must be very carefully designed. This must not incur unreasonable bureaucracy for producers/importers, but should guard against cheating. This could, for example, be based on self-declarations of content, combined with possibility for surprise testing and large penalties in cases of higher chemical content than declared.

7.2.2 Risk factors

- Introduction of a tax on harmful substances, especially as part of the mandatory EPR system, has been *opposed by a number of stakeholders*. Stakeholder acceptability of this approach is deemed low, which makes it less feasible to realise.
- As seen in the discussion within EU REACH Regulation, coming to the agreement as to which chemical should be subject to what level of restriction takes a long time. Even when specific chemicals to be included are agreed upon, the restriction of such chemicals in clothes

requires standardised testing by an authorised entity. All these can be *very time consuming and costly*, and may require duplicated testing.

- In light of various administrative burden mentioned above as well as existence of a number of producers in the country, it is *difficult to enforce taxation comprehensively*, thus the risk of free riders.

7.3 Synergies and conflicts

There are many learning experiences from existing EPR systems for other products such as packaging, WEEE and batteries. In terms of establishment of collection points and working with municipalities, textile producers/PRO(s) that fulfil producer's responsibility on their behalf could consult with manufacturers/PROs of these products. Similarly, municipalities are more experienced with how to incorporate/collaborate with EPR systems when collecting items under EPR systems.

When restricting chemicals, policy makers could review existing relevant legislation such as the EU REACH Regulation and the Stockholm Convention, as well as requirements in existing voluntary programmes such as EU, Nordic and Swedish Eco-labelling schemes and other global standards such as Global Organic Textile Standard (GOTS). Policy makers could then avoid reinventing the wheel, and could also consider whether they could use the certification processes already established under existing legislation/programmes for EPR programme as well. Synergies in this area in return reduce the administrative burden on producers.

Enhancement of material recycling may conflict with the reduction of unwanted chemicals in products. This conflict may not be perceived as critical by clothing producers as compared to, for instance, producers of toys and electronics (Tojo and Thidell, 2012), most likely due to the fact that many of the unwanted substances are washed away during the use phase. However, careful assessment of what is contained in recycled materials is beneficial in order not to accumulate unwanted substances via recycling. This is particularly relevant for substance for enhanced care of textiles which are designed not to be washed away during laundering (e.g. stiffeners and crease inhibitors, fire inhibitors, odour suppressors etc.)

There are some potential conflicts between mandatory EPR and some of the business models supported by PP3 i.e. resell of used own brand, repair, leasing etc. This will be the case if the collection points supported by a PRO are more convenient and more attractive than collection by businesses engaging in those models. In order to avoid this the businesses will

need to include incentives for returning used textiles to them rather than the PRO. In addition, collection by these businesses will need to be taken account of when progress against collection targets is measured.

8. Policy Package 2: Voluntary collective EPR, with raw material fee and recycling certificates

As for the previous section the evaluation of this policy package has been divided into its separate policies with a final section on policy synergies and conflicts. See chapter 3 for details of the policy package.

8.1 Voluntary collective EPR

8.1.1 Critical factors

- Tojo *et al.* (2001) claims that voluntary EPR is best suited for products that have high value at the end of life and where *consumer demand for better end-of-life management can differentiate* the participating brands in the market place. Since used textiles are not of huge value per tonne, consumer awareness may be the critical motivating factor for the industry to participate.
- A pure voluntary EPR without any governmental involvement need *strong commitment and motivation from industry*. Voluntary EPR can be viewed as a first phase or an alternative to a coming mandatory system. Companies may be eager to participate in order to offset the risk of a mandatory EPR.
- *All actors across the textile and clothing sector need to cooperate and join in the initiative*. Producers, importers, retail trade, charity organisations, municipalities and waste management companies *should together agree the content of the voluntary collective EPR including targets*. In addition all on going activities, like voluntary take-back systems of a certain brand or companies, must be connected to the planning.
- Similarly to the mandatory EPR in PP1 *the level of collection, reuse and recycling targets agreed in the Nordic commitment* will be key in

the degree to which the voluntary agreement has an effect. They should be ambitious enough to give significant improvements on current rates, but be clear and simple to measure. Ideally, they should be based on shares of textiles put on the market rather than absolute volumes but that may increase complexity. Examples for target setting can be adopted from the proposal of Swedish EPA done in 2013 or from UK Sustainable Clothing Action Plan 2020 Commitment (SCAP).[15] Critically, they should prioritise reuse over recycling.

- In the Nordic countries, the municipalities have formal ownership and responsibility for the household waste including textile wastes from households as well. There might be *a need to amend national waste legislation* and its section on responsibilities on municipal waste. Potentially an agreement between municipalities and producers could be made.
- In general encouraging upstream effects (i.e. change in product design) is difficult in a collective EPR Tojo (2003). As described in the Policy Package descriptions in chapter 3, these should be included where possible *by adjusting payment fees for more sustainably designed products*. However, it may be difficult if not impossible to achieve consensus on this amongst producers.
- The *voluntary EPR can be nationwide or a common Nordic system*. At least some actors have activities in several of the Nordic countries and their commitment to the voluntary system could promote a common EPR. However, the issue must be considered carefully, since differences between Nordic countries can also complicate building the common system.
- The voluntary EPR *should build on existing collection systems* as far as possible, rather than replacing with an entirely new system. PROs should negotiate with charity organisations and waste management companies for using the collection sites and containers while also establishing new collection points. Cost savings can be achieved through the effective use of existing infrastructure.
- *Collection convenience and information for citizens* are prerequisites for a successful EPR (Tojo *et al.*, 2001). All operators (PROs, charities, municipalities) must have a common communication strategy and a mutual message in order to avoid contradictory guidance.

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[15] http://www.naturvardsverket.se/upload/miljoarbete-i-samhallet/miljoarbete-i-sverige/regeringsuppdrag/2013/etappmal2013forslag/etappmal2013forslag-textilavfall.pdf

8.1.2 Risk factors

- Both voluntary collective and mandatory EPR systems include a great number of mutual benefits as well as mutual challenges, but this can be difficult to administer due to the difficulties of verification.
- Although producer fees can include rebates for upstream effects it is considered a strong risk that producers will not be able to come to consensus on this for inclusion in a Voluntary Commitment underlying the EPR system. *Verification of the sustainability of products may be too difficult to administer* cost effectively.
- Voluntary responsibility involves a risk that *only a minor share of textile producers participates in the system*. Tojo *et al.* (2001) estimated that EPR programmes with governmental involvement in tackling free riders produce higher collection and recycling rates than purely voluntary programmes. It is very likely that in the initial phases of a voluntary EPR just a small group of forerunners are committed to the scheme. The number of signatories will eventually grow as the initiative will gain positive publicity.
- Collection of *non-reusable textiles* can be a problem if *the volumes are not big enough for creating a cost-effective recycling business*. A further risk is that these textiles are exported outside EU and recycled in a not environmentally safe way or landfilled.
- If new collection systems are introduced next to existing ones, there is a risk that *good quality reusable textiles end up being recycled instead of being reused*. With clear reuse targets to fulfil and proper consumer guidance this risk can be minimized. If all textiles are collected via same system and later sorted, the share of reuse will remain or even increase.
- Similarly to the above, *a voluntary EPR system wholly run by producers and brands might prioritise recycling over reuse* since that will provide fewer challenges to the existing business model of high street retailers. To guard against this the targets in the commitment at the core of the agreement need to strongly prioritise reuse.

8.2 Stimulate demand for recycled fibres with raw material fee and recycling certificates

8.2.1 Critical factors

- A recycling certificate system for recycled textile fibres will need to be validated by legislation. National authorities will issue certificates to producers in proportion to the weight of recycled materials they use. The system should encourage the producers to use more recycled materials in the products because if they use less than the required quota level, they have to buy certificates from those with an excess. Producers who use more recycled materials get the benefit. This quota level of recycled materials needs to be checked at regular intervals and can be raised as the supply of recycled textiles increase.
- Means for verifying the quantity of recycled material in products needs to be consistent with existing verification systems such as the Global Recycle Standard run by the Textile Exchange.[16] Use of the GRS system will increase the upstream effects when hazardous materials are systematically avoided in the new clothes.
- Swedish experiences on electricity certificate system have been a successful policy instrument and a model for this textile recycling certificate. However, there are strong differences between the products (electricity and clothes) and therefore the suitability of the instrument for direct transfer to textiles should be further studied.
- A raw material fee is a necessary supplement to the certificate system. In order to achieve a balanced whole, both instruments need to be used simultaneously. Without the raw material fee there would not be an alternative choice for producers and the prices of the certificates could become unreasonably high. However, in theory, the raw material fee can be introduced along with existing EU legislation, but in practice, it could become difficult to implement. This is amongst other things due to administrative issues with respect to defining the fees for each raw material (textiles is usually a mix of

[16] The Global Recycle Standard is a standard developed with the aim of providing brands with a tool for more accurate labelling, encouraging innovation in the use of reclaimed materials, establishing more transparency in the supply chain, and providing better information to consumers. Textile Exchange is a non-profit organization, which operate internationally and are committed to the responsible expansion of textile sustainability across the global textile value chain.

several fibres), as well as administering the fee at the borders, since by far the largest proportion of textile products is produced outside the region, and even outside the EU.

- The choice of the fee level set per kg of new textile fibre is a critical design issue. This should provide significant motivation to promote reuse of used textiles, higher quality clothing and use of recycled fibres in new textiles. On the other hand, it should not risk smuggling of textiles across borders, or other efforts to avoid the fees. Nor should it unfairly impact Nordic producers and brands of textiles in comparison to international brands. Existing examples are e.g. the Danish tax on raw materials (stone, gravel and sand).
- The fee must be applied to all textiles placed on Nordic markets whether they are imported or produced within the market. This requires careful thought as to what point in the value chain the tax should be applied. It may be most appropriate to apply the fee at the point of retail, rather than at the point of import/production of finished textiles or fibres.
- Decisions on relative fees between different types of material are also a critical design element. Ideally the fee should be based on the relative environmental impacts of production of the different materials. However, this may be difficult to reach consensus on and different companies would claim improved production techniques over others. A single fee level for all raw materials would be much simpler to apply.
- Raw material fees paid by producers can be ear-marked for recycling technology R&D (as opposed to a raw material tax). This financing possibility could to improve the conditions of the recycling business.
- A web-based material exchange site for textiles should be established. There are some observed difficulties in the material exchange sites and so far the experiences have not been very promising. Companies will not readily give information concerning their production and volumes, but this might change with a possible income from certificates. A Nordic service might be too restricted, since the textile markets are global. Suitable organisations for global material exchange should be examined together with all significant operators in Europe, like Wrap in UK.

8.2.2 Risk factors

- *Industry is generally opposed to recycling certificates and raw material fees*. The textile market is global and Nordic specific policies and regulations could be seen as trade obstacles for companies. These obstacles do not occur only in connection with global trade but also in connection with trade inside the EU.
- A recycling certificate scheme can create issues in connection with imports, if prices of textiles only increase in Nordic area; *consumers might buy cheaper clothes via mail order*. Certificates would need to apply to mail-order textiles, which could be difficult to administer.
- There is a risk that *a raw material fee might not increase the demand for recycled fibres* which is one of its primary objectives. This is particularly the case where the fee is only applied in a single country. Large multinational brands and manufacturers may be unwilling to change their design and procurement in order to reduce costs in a single country. *The fee may only be effective in promoting recycling if adopted across all Nordic countries or the EU.* On the other hand, the role of increasing costs and thus promoting higher quality textiles (see below) should occur regardless of the geographical extent of the fee.
- Both recycling certificates and raw material fees *might need substantial administration* both from governments and industry.
- At the moment *there are few, if any, sorting facilities for high grade textiles recycling in Europe*. In order to supply high quality recycled materials for production, new sorting and fibre recycling facilities would be needed.
- Development of technology for fibre recycling is still immature and it cannot be said for sure when it will be available on a large scale. This may *prolong the period when only the material fee is used by producers*.

8.3 Synergies and conflicts

A lot can be learned from the British SCAP initiative. All experiences must be examined and evaluated as for their suitability for Nordic operational environment.

Collection of used textiles should preferably be built on existing infrastructure and practises and expanded where collection is lacking.

Voluntary collective EPR can be used without the recycling certificate or raw material fee. Economic instruments like certificates and raw material fees are stronger tools for promoting the textile use but trade and industry do not agree on the possible benefits.

Recycling certificates and raw material fees can also be linked to a mandatory EPR. However the mandatory involvement would be quite high and system might not be cost efficient.

The EU is continuously trying to remove all kinds of barriers of trade inside EU and recycling certificates and raw material fees can be seen as contradictory to the EU principles. Similarly businesses do not support the introduction of these policy tools.

9. Policy Package 3 – New business models

For the evaluation of the business models, key themes for several of the business models have been used to group the key policy and measures needed for their implementation.

9.1 Instruments encouraging higher quality of textiles

9.1.1 Critical factors

- *Increasing quality should be addressed via many routes*. Therefore it may be critical that more than one policy measure is utilised in parallel.
- *Requirement for sustainable design courses* in design schools. It is critical here that the design schools are teaching sustainable design correctly. Therefore *a resource bank, backed by research, of sustainability consideration in textile designs* should be made available to all Nordic design schools. New research is also needed.
- A resource bank could be developed at a European or even global level. The *resource banks need to keep up with new concepts and technology.*
- Resources and education on sustainable design *should be made available to active designers and purchasers* to avoid a delay of several years to before sustainable design is implemented in brands.
- There is still *a lack of knowledge into what sustainable design comprises* – for example cotton is less easily recyclable than nylon but may be more attractive for extended use due to perceptions of quality. Therefore new research is also needed on which types of quality measures contribute to extended life time *and* increased recyclability.
- *Durability labelling* – the critical factor here is likely to be the market share of the labelled product. Neither the Nordic Swan nor the EU Flower enjoys a notable market share with respect to textile products

and especially clothing. *Requiring durability labelling on all textiles would have far greater impacts* on the average quality of textiles placed on the market.
- Durability testing would need to be carried out, or *verified by third party testing laboratories*. It will need to be cheap to make the test affordable.
- Durability labelling will only have an effect if it is *clearly visible and well-communicated to the public.*
- *Review of warranty regulations* for textiles – The most critical element would concern how well "normal" expectations for different kinds of textile products are defined. The more vague the definition, the harder to prove that a product has failed in meeting these expectations.
- The *onus of proof must lie on the producer* to prove that quality expectations have been met.

9.1.2 Risk factors

- Requirement for sustainable design courses: there is a risk that design students could be *given incorrect or out of date knowledge on sustainable design*. This could potentially do more harm than good.
- Review of warranty regulations: warranty regulations extending beyond six months may not be possible due to the nature of textiles and their use. It could be *difficult to prove in court that the producer is to blame for an article wearing out* before time. Durability labelling can be a supporting factor here.
- Durability labelling: the cost of durability testing for each product type might be too high for smaller companies and limited production batches if it was mandatory for all producers. This could risk *pushing the smaller companies out of business*. A solution could be a production batch limit under which durability labelling is not required.

9.2 Raising awareness and capacity building

9.2.1 Critical factors

- Paving the way for new business models needs to cover several steps from idea to implementation and requires multiple instruments.
- *Knowledge hub and advice bureau for start-up of new business models* – Such a knowledge hub/advice bureau can spread knowledge on

available business models and help with overcoming the major pitfalls that new businesses risk.

- Information both on *available funding schemes and available schemes for subsidised employees* (i.e activation of long term unemployed) should be connected to the knowledge hubs/advice bureaus to make it a one-stop shop.
- A likely model is a *central internet based knowledge hub* to which all relevant regional advice bureaus/business incubators have access.
- The advice/business incubation *bureaus will provide advice on sustainable business models within all product types*: there are pitfalls and best practices which will be common to new business models working within many different types of products. Several such incubation bureaus already exist in Nordic countries. Focus on textiles based models should be increased, however.
- A critical factor is that *sufficient knowledge has been gathered and is accessible to the bureaus*. Similarly to the resource bank for sustainable design (see under 5.1.1 above) the business model knowledge hub should include experiences from across the Nordic region and perhaps also from other countries.
- The broader the geographic base for the knowledge hub the less directly applicable the knowledge they contain will be. Business law, tax law etc. funding opportunities etc. differ from country to country. *Country differences need to be highlighted within the business hub.*
- The need to gather this kind of up-to-date and country specific information requires that sufficient resources are set aside to build up and maintain the knowledge hub. There must be a relatively *free flow of information on experiences from existing alternative businesses* to the hub. One way of ensuring this is to require that new businesses that gain funding from incubation funds must report back on experiences to the funding body. Information on good and bad practice in the hub may need to be anonymous.
- *A Nordic award for companies adopting Green Business Models* as part of the green growth strategy could aid in raising awareness of innovative green business initiatives and models. A critical element of the success of this will be the level of *media attention given to the award nominations* and ceremony. Information should also be available on the type of model and the economic and environmental successes they have achieved. Media dissemination will need to be focussed towards established businesses and entrepreneurs.

9.2.2 Risk factors

- *Increased awareness and information alone will not lead to implemented green business models* and it is important that knowledge is also supported by financial incentives (see under 3.3).
- There is a risk that good practice information gathered by a knowledge hub may be insufficient for start-up businesses. A *large number of start-up failures* during the first years of operation could have a strong negative effect on the willingness of entrepreneurs to engage in these new business models.

9.3 Improving economic and financial conditions

9.3.1 Critical factors

- Improving economic and financial conditions for new business models needs to be addressed via several routes.
- *Financial support for second hand in city centres* A clear support of reuse and repair is to provide rent subsidies to allow for second hand and repair shops to establish themselves in the mainstream shopping centres and other well trafficked shopping areas. This can be *important to mainstream second hand textiles.*
- Critical elements of the design of such a "square metre scheme" for second-hand will be 1) *assigning the funding to the most intensive shopping areas of cities* 2) ensuring that the available money is used in the most effective way possible by *issuing it via competition*: funding is awarded to those that apply for the least funding per square metre of floor space for second-hand retail 3) *awarding the funding via municipalities* rather than state government: these will be best placed to administer the scheme 4) to *allow high street retailers to also apply for the funding*: this could encourage a mainstreaming of second hand 5) having *a verification and penalty system in place* to ensure that that the businesses are selling second-hand within the floor areas for which they are receiving financial support 6) setting a minimum period over which they have to use these spaces for second hand sales.
- *VAT reductions/removal for second-hand, leasing and repair* Providing the lowest possible VAT for businesses primarily not using new materials increases their competitiveness. However, the effect is relatively small and *needs to be supplemented by other measures* to have a significant effect, especially for labour intensive businesses, e.g. clothing libraries, leasing, repair services etc.

- There must be *a clear definition of which activities qualify* and don't qualify for reduced/removed VAT. The definition should *avoid loopholes* but also avoid excessive bureaucracy. The system should be at least as cost-effective as more direct subsidies otherwise there is little point in adopting it.
- Ideally the design should also *allow for companies with mixed activities to apply for VAT reductions/removal* for those parts which involve repair, reuse and/or leasing. This could encourage high street fashion retailers to also engage in second-hand and repair services and mainstream these models. On the other hand allowing VAT-removal for individual operations can potentially open up for loopholes and increased bureaucracy. A fine balance needs to be made here between the opportunities and risks presented by this option.
- Any VAT changes must be *compatible with EU rulings* on minimum VAT rates.
- *Government funding pool for start-up investments in new business models.* These already exist in most if not all Nordic countries, like e.g. Innovasjon Norge (Norway) and Grøn Omstillingsfond (Denmark). The critical issues with respect to textiles is ensuring that 1) *textiles are identified as a priority area* for funding 2) funds are available for the types of activities typical of start-ups in new business models in textiles i.e. marketing, development of internet sites for exchanging etc., and potentially also staff costs 3) information on funding and the fund itself *are linked to knowledge hubs and advice bureaus* to ensure optimal and most targeted application of these funds by the start-up businesses (see under 3.2).
- *Government funding pool for start-up investments in new business models.* These already exist in most if not all Nordic countries. The critical issues with respect to textiles is ensuring that 1) *textiles are identified as a priority area* for funding 2) funds are available for the types of activities typical of start-ups in new business models in textiles i.e. marketing, development of internet sites for exchanging etc., and potentially also staff costs 3) information on funding and the fund itself *are linked to knowledge hubs and advice bureaus* to ensure optimal and most targeted application of these funds by the start-up businesses (see under 3.2).
- *Long-term unemployed wage subsidies earmarked for sustainable business models.* An already commonly used tool for increasing reuse and repair are work programmes for people having difficulties getting employed. Creating an earmarked subsidised environment for

them to collect, repair and sell textiles often provides societally beneficial reuse.
- It is critical that *knowledge on these subsidies is provided to the knowledge hub and advice bureau* discussed under 5.2 above. Furthermore that these are designed with safeguards to ensure subsidised employees are not just used as a source of cheap labour for new businesses. They *must also benefit the employee* via training and opportunities for regular employment once the subsidised period is over. Finally, careful vetting of the types of business which can apply for such funding is necessary. Potential criteria are that the applying organisation is non-profit and provides sustainability benefits.
- *Raw material fee on new textiles* For an overview of critical issues see under Policy Package benefits.

9.3.2 Risk factors

- New businesses adopting the models *may fail as soon as support periods end*. Support frameworks should therefore be long term but also aim at eventual self-sufficiency of models.
- Models that involve leasing or borrowing/sharing likely requires a changed mind-set to expand outside their current domain. *Even substantial subsidies may not be enough to make them competitive.*
- There is always a *risk of misuse of benefits* such as reduced VAT and there needs to be sufficient control so that the implemented measures have the intended effect. The same is true for support to second-hand in city centres. This can potentially be misused unless it is intelligently designed and well controlled by municipalities.
- Rent subsidizes and decreased VAT *are not revenue neutral for* national/municipal treasury and thus it is possible that taxes need to be added on other categories.
- For risks concerning raw material fees see under Policy Package 2.

9.4 Synergies and conflicts

A key factor for all alternative business models is the issue of quality. Reuse, second-hand, leasing and repair services are all dependent on a sufficient quality and durability of new textile products to allow a long active lifetime by many users. Moreover, the higher the quality of textiles, the higher the per article price. This makes repair, second-hand

leasing etc. increasingly economically attractive to consumers in comparison to current buy and dispose models.

In the long, textile quality will be promoted via capacity building and education of designers and purchasers. In the short term to provide the incentives to produce textile products with a higher technical and aesthetic quality. A raw material fee can be a game-changer for the textile industry if set high enough, and strongly promote sales of fewer high quality items rather than large amounts of fast fashion.

If higher quality clothing is more costly per item, this will have the knock-on effect of reducing volume (i.e. weight) of sales but not their value (in Euro). This should lead to a reduction in environmental impacts caused by the consumption of textiles, without leading to reduced income for businesses, nor reduced utility for consumers.

None of the instruments on their own is likely to be able to bring about a paradigm shift in the way we provide access to textile products. However, if all or many of the identified instruments are adopted in parallel the potential for a paradigm shift is much stronger. Complementarity between the various instruments is considered to be strong i.e. durability labelling/testing and extended warranty periods seem to be directly compatible. Knowledge hubs and various economic support measures can be strongly linked.

Only one potential conflict has been identified between the various instruments. This is the extent to which they promote reuse OR recycling of used textiles. Instruments aimed at improved quality of textiles will tend to support reuse/extended life models. A raw material fee, on the other hand, is primarily intended to increase the demand for recycled fibres in the production of new textiles i.e. would support a recycling model. This is potentially problematic: as discussed elsewhere (Watson *et al.*, 2014) reuse should always give greater environmental benefits than recycling.

However, it is hard to imagine that a raw material fee could have such a strong effect that the market price per kg for recycled fibres would exceed the market price for second hand. Thus a raw material fee is expected to have the effect of diverting textile waste from landfill/incineration to recycling, rather than diverting used textiles from resell/reuse to recycling.

10. Synthesis and further studies

10.1 Combinations of policy packages

When considering where the proposed policy packages have their impacts it is clear that both mandatory and voluntary collective EPR systems would have a significant impact on collection of used textiles but a more limited effect on the pre-consumer (upstream) stages of the textile life cycle. On the other hand, a widespread use of some alternative business models supported by Policy Package 3, such as leasing and resell of own brand, have a clear upstream effect, but perhaps more minor impacts on overall collection, reuse and recycling.

The EPR systems have potential for creating green jobs in collection, reuse and recycling but might to a large extent create jobs in other regions rather than in the Nordic countries where markets for sorting and low grade recycling already exists. With limited development in sorting and recycling technology, the short term effect will likely be export of mixed used textile fractions for sorting outside the Nordic countries.

The alternative business models supported by Policy Package 3, on the other hand, are often more labour intensive and tend to create more local green jobs involved in take-back, repair, laundering and resell of textiles. Such jobs need to be close to the consumer and thus would be placed in Nordic countries.

A further difference is that the EPR systems, in particularly a mandatory system, would create large flows of used textiles. This is a prerequisite for investment in sorting and recycling technology. With proper supplementary measures, this can create an opportunity for increased investment in this area within and outside of the Nordic countries. This is not the case for most of the alternative business models which are primarily focused on prolonging the lifetime of textiles rather than recycling.

There is therefore potential for many synergies between the different systems to strengthen each other's weaknesses, The voluntary or mandatory EPR systems are of course by definition mutually exclusive but either one of them can, and perhaps should, be accompanied by additional measures to promote alternative businesses such as leasing, clothing libraries, resell of own brand etc.. Thus a substantial collection of

used textiles can also be supplemented by upstream effects such as design for longer active lifetimes of products

The supplementary policies – chemical taxes, recycling certificates and raw material fees – needs to be further investigated in their application to textiles before an implementation is made and currently do not have the industry's support.

10.2 Focus for further studies

The work with policies investigated in this report provides a basis for what policy instruments and measures to investigate further. There are a number of areas where additional studies are clearly needed and further studies are proposed in the list below:

- Further *studies on numbers and placement of green jobs* that would result from mandatory and voluntary EPR's and new business models such as leasing, resell of own brand etc.
- Study on the *costs and benefits of recycling certificates and recycled content quotas*. How they would affect the textile market and if there are any unforeseen effects. A comprehensive comparison to the green electricity certificates and identification where the market differs and what experiences learned from the electricity certificates can be used when implementing recycling certificates for textiles. It is especially important to focus on lessons to be learned from the implementation process.
- To what extend *could a mandatory EPR be based on existing models for packaging waste/electronic waste* etc.? How do the products and markets differ and what lessons can be taken from the already implemented mandatory EPR systems. What more lessons can be learnt from the French EPR regulations for textiles?
- Further *studies on the pros and cons of monopolised Product Responsible Organisations (PROs)* as opposed to having two or more competing PROs.
- An analysis of the *effects of raw material fees on the full supply chain*. Who would bear the cost of the fees and who would gain from it? Would raw material fees within the Nordic countries be allowed according to trade agreements? How can a learning system be designed? At what point in the value chain should the fee be applied i.e. at point of import/production or at the point of retail?

- A survey of available funding for green businesses in the Nordic countries and the EU.
- A calculation of the *impact of reduced taxes and VAT for leasing, reuse and repair services on the municipal and national accounts.*
- Further investigations on *what instruments would incentivise designers and procurers to produce higher quality, more durable products.*
- Definition of *how quality/durability and product price are related to one another.* Standards and procedures for how to differentiate on quality across different textile materials including development of measurement technology must be developed.
- *Life cycle assessments on different textile production chains and textile fibres* are needed since there are large differences in the environmental impact of different products and producers. This could for example feed into fee levels for different materials under a raw material fee regulation. The knowledge of actual environmental impacts from different products and materials are still low.

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12. Sammenfatning

Denne rapport er det primære resultat af Del II af projektet "An extended producer responsibility (EPR) system and new business models to increase reuse and recycling of textiles in the Nordic region" (*Et producentansvarssystem og nye forretningsmodeller til øget genbrug og genanvendelse af tekstiler i Norden*), som er iværksat af den Nordiske Affaldsgruppe (NAG). Denne rapport er samtidig den anden og sidste rapport i en række af to rapporter om projektet. Den første rapport, som præsenterede resultaterne fra Del I af projektet, blev publiceret i juni 2014. Rapporten kan downloades på Nordisk Ministerråds hjemmeside.

Målet med denne anden rapport er at præsentere tre pakker af politiske instrumenter, som skal støtte op producentansvarssystemer og/eller forretningsmodeller, baseret på erfaringerne fra Del I af projektet. Målet er ydermere at vurdere potentialet af de forskellige producentansvarsordninger og forretningsmodeller i forhold til kritiske faktorer, risici og synergier.

Del I og Del II er som samlet projekt en del af de Nordiske statsministres grønne vækst initiativ *The Nordic region – leading in green growth*. Projektet er et af tre tekstilrelaterede projekter og er udarbejdet i samarbejde mellem Copenhagen Resource Institute (Danmark), IVL (Sverige), Østfoldforskning (Norge), SYKE (Finland), IIIEE ved Lund Universitet (Sverige) og Environice (Island). Projektet startede i juni 2013 og blev afsluttet med udgangen af 2014.

Arbejdet er udført som en kombination af litteraturstudier og konsultation med nøgleaktører fra tekstilbranchen. Man har sikret sig aktørernes involvering ved at oprette en referencegruppe, som bestod af en bred skare af eksperter og repræsentanter fra tekstilbranchen. Ydermere er der blevet afholdt to workshops. En i november 2013 i Stokholm samt en i oktober 2014 i København. Begge workshops blev koordineret af Sustainable Fashion Academy i samarbejde med Nordisk Ministerråd.

Læs mere om de nordiske statsministres Grøn Vækst initiativ i webmagasinet "Green Growth the Nordic Way" på www.nordicway.org eller på www.norden.org/greengrowth

Struktur

Denne Del II af projektet præsenterer forslag til tre pakker af instrumenter baseret på erfaringerne fra Del I. Rapporten er opdelt i to underrapporter, svarende til de to hovedopgaver i Del II af projektet. Disse opgaver følger opgaverne, som er beskrevet i rapporten for Del I.

De politiske instrumentpakker går ikke i detaljen med specifikke elementer, men er mere tænkt som inspiration og baggrundsdokumentation for de nordiske regeringer.

De tre forslag til pakker af politiske instrumenter er:

- *Politisk instrumentpakke 1*: *Lovpligtigt producentansvar* med en skat på farlige stoffer i tekstiler som et muligt ekstra instrument.
- *Politisk instrumentpakke 2*: *Frivilligt producentansvar* med genanvendelsescertifikater og en råmateriale afgift som mulige ekstra instrumenter, for at styrke markedet for genbrugte og genanvendte tekstiler.
- *Politisk instrumentpakke 3*: En *samling af politiske instrumenter* som skal støtte og udbrede en række lovende alternative forretningsmodeller, som øger produkternes faktiske levetid, genbruger eller eventuelt genanvender tekstilprodukter.

Hver pakke indeholder en række forskellige instrumenter, der indbyrdes komplimenterer hinanden, men enkelte elementer fra hver af pakkerne kan også enten implementeres selvstændigt eller kombineres med elementer fra en af de øvrige pakker. Det frivillige producentansvar kan eksempelvis introduceres uden genanvendelsescertifikaterne og råmateriale afgiften. Og genanvendelsescertifikaterne og råmateriale afgiften kan også kombineres med et lovpligtigt producentansvar.

Den tredje pakke, som er en samling af mange forskellige politiske instrumenter, skal støtte op om forskellige forretningsmodeller som eksempelvis leasing, reparation, salg af genbrug mm. Men flere af elementerne inden for denne pakke kan også have en positiv effekt på det kollektive lovpligtige eller frivillige producentansvar. Pakke 3, eller de enkelte elementer inden for pakken, kan således implementeres parallelt med enten Pakke 1 eller Pakke 2.

Resultater

I projektet er det blevet klart, at både det lovpligtige og det frivillige producentansvar vil medføre en markant øget indsamling af brugte tekstiler, men også en mere begrænset effekt i de stadier af værdikæden, som ligger forud for forbrugeren (dvs. især design og produktion). I modsætning hertil vil et øget brug af de alternative forretningsmodeller som eksempelvis leasing eller gensalg af egne brugte produkter formentlig have en effekt på de tidlige led i værdikæden, men til gengæld en mindre effekt på indsamling og genanvendelse.

I forhold til jobskabelse, kan producentansvaret potentielt skabe grønne jobs inden for både indsamling, genbrug og genanvendelse af brugte tekstiler. Disse jobs vil imidlertid sandsynligvis blive skabt i regioner hvor der allerede eksisterer et marked for sortering og lavkvalitets genanvendelse, frem for i Norden. Med en begrænset udvikling inden for sorterings- og genanvendelsesteknologier vil effekten på kort sigt således formentlig blive, at de brugte tekstiler vil blive eksporteret til sortering uden for de nordiske lande.

Forretningsmodellerne som støttes op af Pakke 3 er hovedsageligt mere arbejdskraftintensive end producentansvarsordningerne og vil således skabe flere lokale grønne jobs i forbindelse med eksempelvis tilbagetagningsordninger, reparation, vask og rens samt videresalg af brugte tekstilprodukter. Denne slags jobs vil være lokaliseret tættere på kunderne – altså i de nordiske lande.

En yderligere forskel er, at producentansvarssystemerne, særligt det lovpligtige, kan skabe øgede flows af brugte tekstiler. Dette vil være en forudsætning for investering i sorterings- og genanvendelsesteknologier. Med passende supplerende instrumenter kan der skabes øgede investeringer både inden- og uden for Norden. Dette vil ikke være tilfældet for forretningsmodellerne idet de primært fokuserer på at forlænge tekstilernes levetid frem for genanvendelse.

Der er således potentiale for mange synergier mellem de forskellige systemer, som kan styrke deres individuelle svagheder. Det lovpligtige og det frivillige producentansvar udelukker hinanden, men hvert af dem kan, og bør, ledsages af yderligere instrumenter, som kan fremme forretningsmodeller som leasing, tøjbiblioteker, gensalg af egne brugte produkter mm. En betydelig indsamling af brugte tekstiler kan således suppleres med eksempelvis design for en længere levetid samt andre effekter der ligger længere tilbage i værdikæden.

De supplerende instrumenter (skat på farlige stoffer, genanvendelses-certifikater og råmaterialeafgiften) skal undersøges yderligere i forhold til deres anvendelse på tekstiler, førend de indføres. I deres nuværende form, har instrumenterne ingen opbakning fra aktørerne branchen.

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EPR-systems and new business models

This report is the primary outcome from Part II of the project "An extended producer responsibility (EPR) system and new business models to increase reuse and recycling of textiles in the Nordic region." This report is the second and final report from this project.

The report proposes three packages of policy instruments:

- Mandatory extended producer responsibility with a supplementary tax on hazardous chemicals in textiles.
- Voluntary collective EPR with supplementary recycling certificates and raw material fees.
- Pool of policy instruments for new business models that in-crease the active lifetime, reuse and eventual recycling of textiles.

The report is part of the Nordic Prime Ministers' overall green growth initiative: "The Nordic Region – leading in green growth" - read more in the web magazine "Green Growth the Nordic Way" at www.nordicway.org

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