



policies supporting reuse, collective use and prolonged life-time of textiles

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preface

A special thank you to the representatives from the 11 interviewed companies. Your participation is highly appreciated and important for our research results.

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A Mistra Future Fashion Report

Mistra Future Fashion is a cross-disciplinary research program, initiated and primarily funded by Mistra. It holds a total budget of SEK 110 millions and stretches over 8 years, from 2011 to 2019. It is hosted by RISE in collaboration with 15 research partners, and involves more than 50 industry partners.

www.mistrafuturefashion.com



summary

In 2016 138 000 tonnes of new clothes and household textiles were put on the Swedish market (Statistics Sweden, 2017). The production of textile products causes significant environmental impacts. Business models engaged in reuse, collective use and prolonged life-time of textiles therefore have a potential to contribute to reduced total textile consumption and, as a consequence, reduced environmental impacts from textile production.

Preceding work in Mistra Future Fashion (Watson et al, 2017) identified ten different supporting policy instruments for business models that extend active lifetimes of garments. The objective of this report is to select three of the previously identified policy instruments and estimate the economic, environmental, social effects of these. The three policy instruments selected for further assessment were:

- A wage subsidy earmarked for businesses that extend the active lifetime of textiles
- A knowledge hub assisting businesses start up or transition to more circular models
- Start-up/transition fund for business models/initiatives that extend the active lifetime of textiles

Summary of the effects:

	Effects on companies	Cost for the government	Environmental effects, less newly produced textiles put on the market each year.	Social effects/ acceptance	Cost for doubling the lifetime of 1 tonne textiles
Wage subsidy	About 2000 more employees with wage subsidies.	175 million SEK	1 500 tonnes	Can possibly contribute to integration Good	117 000 SEK
Knowledge hub	3 % increased turnover for 100 companies 10 % increased turnover for 25 companies	3 million SEK	75 tonnes	Good	40 000 SEK
Start-up/ transition fund	16 % increased turnover for 10 companies	4 million SEK	23 tonnes	Good	174 000 SEK

The cost effectiveness of the instruments – i.e. the cost of implementing or administering them per unit benefit - are more similar. The knowledge hub is most cost effective due to low costs and a large potential number of participating companies. Seen purely in the context of carbon savings the three instruments would seem to have a very low cost effectiveness compared to a range of carbon offsetting schemes. However, they also lead to green job creation and a range of other environmental benefits. The wage subsidy can also lead to social benefits if the subsidy is linked to employment of disadvantaged groups.

All three instruments have the capacity to contribute to a long-term change in the textile market. Moreover, they are highly compatible with one another and used together could provide relatively strong drivers for a transition to sharing, repair, leasing business models in the Swedish textile market. All three instruments were viewed as being of reasonable or high acceptability to both government and the textile industry and relatively straightforward to implement.

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1. introduction

In 2016 138 000 tonnes of new clothes and household textiles were put on the Swedish market (Statistics Sweden, 2017). The production of textile products causes significant environmental impacts. The precise environmental impact of textiles varies significantly depending on the fibre type, but generally speaking they include:

- energy use, greenhouse gas (GHG) emissions, nutrients releases (leading to eutrophication) and toxic substances from washing (water heating and detergents) and dying of textiles;
- energy use, resource depletion and GHG emissions from processing fossil fuels into synthetic fibers, e.g. polyester or nylon;
- significant water use, toxicity from fertilizer, pesticide and herbicide use, energy use and GHG emissions associated with fertilizer generation and irrigation systems related to production of fiber crops, e.g. cotton;
- water use, toxicity, hazardous waste and effluent associated with the production stage, including pre-treatment chemicals, dyes and finishes. (Retail Forum for sustainability, 2013)

The environmental impacts from textile production can be reduced by a range of cleaner production processes and selection of more sustainable raw materials. These aspects are considered under the Supply Chain theme in the Mistra Future Fashion Program (see e.g. Roos et al, 2017 and Holmquist et al, 2016).

However, the environmental impacts from textile consumption can also be reduced by extending the active lifetime of a garment and thereby offsetting new production. Business models engaged in reuse, shared use and prolonged life-time of textiles therefore have a potential to contribute to reduced total textile consumption and, as a consequence, reduced environmental impacts from textile production (Watson et al, 2015).

There are many opportunities for business models to derive value via extending the active life of garments either via the same user, or shared use (Watson et al, 2015; Elander et al, 2017). However, the tendency in the industry over past decades has been moving in the opposite direction in the form of fast fashion; more collections, shorter lifetimes and swelling volume sales (Fletcher and Grose, 2012). Turning the tide back towards longer lifetimes needs radical changes in consumer patterns and norms and not least in the business approach of the textile industry.

As part of the research programme Mistra Future Fashion, IVL Swedish Environmental Research Institute and PlanMiljø have investigated opportunities for governments to play a role in this transition by supporting alternative business models. This work is briefly summarised below.

1.1 previous work in Mistra Future Fashion

Previous work in Mistra Future Fashion has evaluated business models for increased reuse, collective use and prolonged life time of textiles identifying both obstacles and success factors for such business models (Elander et al., 2017). The identified obstacles could be reduced or overcome by changing existing or introducing new regulatory and economic frameworks, or by providing more direct economic assistance to entrepreneurs engaged in business models prolonging the active life time of garments in the start-up phase.

Watson et al (2017) carried out an initial evaluation of ten potential supporting policy instruments for business models extending active lifetime of garments, selected from a wider pool of 20. Critical features of the ten policy instruments were described as well as their potential complementarity and conflict with existing policy and with one another.

1.2 objectives

The objective of this report is to estimate the economic, environmental and social impacts of three instruments selected from the ten policy instruments analysed by Watson et al (2017) supporting reuse, shared use and prolonged (active) life time of textiles.

1.3 method

Figure 1 gives a schematic overview of the research carried out and described in this report. The research builds upon preceding work in Mistra Future Fashion, the first area in Figure 1. The different research steps include selection of three policy measures for impact assessment and finally the impact assessment that use both quantitative and qualitative data.



Figure 1. Schematic overview over methodology used in this report

In order to select the three most promising instruments PlanMiljø and IVL arranged a stakeholder workshop in Stockholm in October 2016. The results of this workshop were complemented with an expert analysis to make a final selection of the three instruments.

1.4 method for impact assessment

The method used for the impact assessment of a given new policy includes several steps:

1. Identifying the baseline scenario. The baseline scenario is the situation in Sweden year 2017.

2. Literature study on measured impacts of similar policies carried out elsewhere and/ or with different sectors/product types in focus.

3. Adjusting the magnitude of the impacts of similar policies to give an estimate of the magnitude of impacts of the given policy. This step made use of statistical data and information collected from interviews with government bodies and companies engaged in business models that extend the lifetime of textiles.

4. As an environmental indicator we have used the decrease in new textile put on the Swedish market, since that is an effect that can be compared between the three policy instruments. The actual environmental benefits from offset production will depend upon what types of textiles are offset and where these are produced.

As for most impacts assessment of new policy instruments there is insufficient data available to carry out a fully reliable impact assessment. We have made qualified assumptions erring towards the conservative where we are missing data.

1.5 interview study

An interview study was performed via 11 in-depth semi-structured interviews with Swedish large and small companies engaged in business models that extend the lifetimes of textiles. Five of these companies were also interviewed by Elander et al (2017) concerning these business models. Of the remaining companies, two (Lindex and Klättermusen) have been involved in other Mistra Future Fashion projects and four have not previously been involved in the programme. These latter include new companies that have newly emerged in the sharing platform sector.

The 11 selected companies give a reasonable spread over the four main types of business models that extend the lifetime of textile products; clothing libraries and other sharing platforms, redesign, longer technical life and take-back and resale (see Table 1). The purpose of the interviews was to ask businesses to predict how the various proposed policy measures might affect their activities and thus add qualitative information to the quantitative estimates described under 1.4.

Under a semi-structure approach all interviewees were addressed with the same questions (see appendix 1: interview guide). The interview guide included a short introduction from the interviewer, general introductory questions and specific questions regarding economic, environmental and social aspects.

Based on the interviewees' responses to the questions, more specific and tailor-made follow-up questions were asked.

The interviews were carried out as telephone interviews (ca 60 minutes per interview). The policy instruments were briefly presented and explained to the interviewees before asking the subsequent question.

Table 1. Business model types run by the companies interviewed according to definitions given in Elander et al (2017)

Interviewee	Own product take-back and re-sale	Sharing with other users	Longer technical life	Redesign
1. Lindex				х
2. Stormie poodle				х
3. Rent a Trend		x		
4. Something borrowed		х		
5. Nudie Jeans Co	Х		Х	
6. Lånegarderoben Stockholm		X		
7. Rent-a-plagg		x		
8. Houdini Sportswear	х		х	
9. Klättermusen	x		x	
10. Curatorz		х		
11. Sabina & Friends		x		

0



'there are many opportunities for business models to derive value via extending the active life of garments either via the same user, or shared use'

2. selection of policy measures for impact assessment

Watson et al (2017) selected ten policy measures from a pool of 20 promoting business models extending active lifetime of garments and carried out a first analysis of these. In order to select the three most promising instruments for deeper evaluation PlanMiljø and IVL arranged a stakeholder workshop in Stockholm in October 2016.

In the workshop the participants plotted the magnitude of expected impact, i.e. the level to which the instrument would positively impact on the growth of business models for extending active lifetimes, against 'do-ability', i.e. a combination of the acceptability of the instrument to important stakeholders, and how easily it could be implemented and administered. The selected policy measures represent the three policy measures deemed to have the largest do-ability, as illustrated in Figure 2.



Figure 2. Level of positive impact (on green business models) and do-ability of the ten identified policy measures according to stakeholders at workshop (Source Watson et al, 2017)

The final selection criteria for policy instruments included the expected impact and do-ability, as explained above, complemented by additional selection criteria: development of new knowledge and relevance to the policy agenda. The latter was taken to mean relevance to Swedish policy. Policy measures that would be more meaningful at European or international level were not considered.

The result of this selection process, was the following three policy measures, selected for impact assessment of the following scenarios:

Ρ	olicy scenario 1.	Wage subsidy The Government introduce earmarked for business and other consumer pro- employee with 50 percer percent). The subsidy, we effect for at least five ye
Ρ	olicy scenario 2.	Knowledge hub The Government introdu hub, which free of charg guidance and informati lifetime of garments an exchange experiences a
Ρ	olicy scenario 3.	Start-up/transition fund A start-up or transition business that themselve development program f of garments

uces as of January 1st 2019 a wage subsidy ses that extend the lifetimes of clothing oducts which reduces the wage cost per ent (other scenarios 25 percent or 75 vhich can be applied for online, will be in ears.

uces as of January 1st 2019 a knowledge rge provides businesses with training, ion on business models extending the d networks where entrepreneurs can ınd ideas.

ding

grant corresponding to 250 000 SEK to es match with 50 percent of the cost for a for business models extending the lifetime

3. examples of similar policies instruments

We carried out a literature search of similar policy instruments that have been adopted in Sweden with respect to other sectors, or in other countries for textiles businesses or other sectors. The objective was to gain information on the impact of these similar policies, to assist in estimating the impact of the policies if applied to the textiles sector in Sweden.

3.1 wage subsidies for green jobs

We could find no examples of such policies in Sweden but found a number of policies elsewhere in Europe and further abroad. The first two examples, moreover, concern green jobs in sectors processing and reselling textiles along with other products.

Wage subsidies for people with difficulties finding employment earmarked for the so-called 'kringloop' sector (Netherlands and Flanders)

The kringloop sector comprises social enterprises working within collection, processing and sale for reuse/recycling. Includes clothing, furniture, electronics, books, games etc. This wage subsidy has been running since the mid-1990s in both countries but is under review, and likely to be phased out in Flanders. The subsidy seems to have been successful in terms of increasing reuse and recycling in combination with social support. Flanders has set the target for the sector of achieving 7 kg sales of reusable goods per inhabitant per year by 2022. In 2016 the sector in Flanders employed 4200 people and had processed 73 784 tonnes (11.4 kg/capita) of potentially reusable goods from citizens and businesses. 5.3 kg per capita was sold for reuse in the shops of which 0.5 kg/capita were textiles. 28% of collected textiles were resold in the kringloop shops. The remainder was mostly exported. (Komosie, 2017).

Wage subsidies for textile sorting facilities earmarked for people with difficulties finding employment (France)

France has an extended producer responsibility (EPR) for textiles and shoes. Producers pay a central non-profit organisation EcoTLC a fee according to the quantities of textiles they place on the market. This money is then used in a number of ways to achieve textile collection, reuse and recycling targets. One of these uses is to pay subsidies to sorting facilities where collected textiles are sorted into different grades for reuse and recycling. This subsidy was established by the regulations that set up the EPR system. The sorters are one of the weak links in the used textile value chain. By supporting them, this supports a per kg price for collected used textiles which is high enough to give an incentive to collectors to increase collection rates. Collection rates in France have increased from 18 percent in 2010 (shortly after adoption of regulations) to 36 percent by 2016. In addition, to this national policy, the City of Paris has also established support to so-called Recycleries via a wage subsidy modelled on the kringloop wage support in the Netherlands and Flanders (City of Paris, 2017).

Wage subsidies for new graduates in green jobs in biotechnology, environmental and other sectors (Canada)

BioTalent Canada, a national non-profit HR association for Canada's bio-economy recently announced the extension of its wage-subsidy initiative to help new graduates across Canada land a 'green' job in biotechnology, environmental and other sectors. The federally-funded program will provide \$2.3 million in wage subsidies to facilitate over 200 new jobs over the next two years. Eligible companies will be those with a sustainable development mission, or those with products or services that directly reduce carbon footprint, enhance recycling or reduce waste.

Wage subsidies have a positive historical record of jumpstarting careers especially for new biotech graduates and helping small- and medium-sized enterprises (SMEs) access funding to hire new talent. According to BioTalent Canada's 2017 labour market report on youth employment, Opening the Door II, almost 85% of new graduates retain full-time employment even after their wage subsidy ends (BioTalent Canada, 2017). BioTalent has a long track record of successful implementation of wage-subsidy programs, and will disburse over \$10.3 million in wage subsidies, to create 1,400 job placements over the next four years. The Green Jobs program will form an important component of those new placements (BioTalent Canada, 2018).

3.2 start-ups funds

Grøn omstilling fund (Denmark)

The fund ran from beginning 2013 to end 2015 with the goal of providing assistance to green business models within various sectors. According to assisted companies the fund led to 120 new fulltime jobs and an increased income of 30 million DKK (much less than the value of the fund). The fund had various streams for providing assistance including a knowledge hub activity (Erhvervsstyrelse, 2016):

- Co-financing for product and business development (provided 60 million DKK to assist 33 product development and business model concepts with great potential);

- Task Force for Green Industrial Symbiosis (a free "resource check" for 516 companies telling them about their potential via green industrial symbioses. 172 identified potential and 78 received financing for further development. Of the 172, 11 percent of 172 identified potential symbiosis have been implemented with another 37 percent on their way);

- Accelerator program for new green business models (assistance to 29 companies under Phase 1 and 15 companies under Phase 2 to develop, test and pilot business concepts. Phase 1 support up to 250.000 DKK; Phase II support up to 1 million DKK per project. 14 out of final 15 launched their concept);

- Partnerships (assisted 8 partnerships for a total of 20 million DKK in dissemination and sharing of knowledge between companies);

- Analysis of resource efficiency and circular economy (development of analysis and reports to assist businesses

Vinnova Re:Source program(Sweden)

This program launched in 2016 and run by Vinnova, the Swedish Energy Agency and Formas is a national industry-wide innovation arena for actors within Swedish industry, waste management and research. The aim is to make Sweden a world leader in the circular economy. The first stage will run from 2016-2018, but the plan is to extend the program over a total of twelve years. The strategic program sets out Strategic innovation agendas and then establishes economic and other support for projects and other activities that contribute to the agenda's vision and goals.

Financial support can be gained for three distinct types of projects depending on the maturity of the concept: research/idea development projects, innovation projects and demonstration projects. Research/idea development projects can receive 70% funding, innovation projects 50% funding and demonstration projects maximum 35% funding.

Research/idea development projects can gain 250 000 to 500 000 SEK; innovation projects maximum 3 million SEK and demonstration projects maximum 5 million SEK.

So far three calls for projects have been issued, one in 2016, a second in 2017 and the third with an application deadline of 6th February 2018. Funding issued under the first call totalled 45 million SEK; the second call a further 45 million and; 40 million is earmarked under the final call. The funding program is expected to support over 80 projects during the first four years. It is too early to make an evaluation so far of the effects of the environmental, social and business effects of the program.

3.3 knowledge hubs

The Swedish Agency for Economic and Regional Growth has run a large range of knowledge hubs in recent years. Table 2 gives an overview of these for a range of business types. These have reached out to between 5 and 88 companies a year. (Swedish Agency for Economic and Regional Growth, 2017).

In general the programmes have been established to maintain Sweden as a competitive economy with a viable business sector, and are principally aimed at assisting companies to get more engaged in the global economy. The knowledge programs aim to improve the current position of Swedish businesses via increased knowledge and facilitation through networks and financing.

Not all the programmes have sustainability as a central goal, but the projects funded under the Innovation Express programme 2016 for example, all concern sustainable solutions and circular economy. The activities offered by the programs range from coaching and advice regarding EUregulation, innovation, matchmaking, networking and financial support. The results and impacts from the programs that can be evaluated at this stage have been very positive for the participating businesses. For example, results from Innovation Express 2016 show:

- 70% of the Swedish participating businesses claims to have identified new market opportunities;

- 80% that they have gained access to new business partners;

- 50% that they now have partners from other business sectors;

- 10% claim to have initiated research and development projects

Table 2. Number of companies attending different knowledge programs organized by Swedish Agency for Economic and Regional Growth year 2016

Name of program:	Description	Number of Swedish participating companies
Enterprise Europe Network. Coaching on innovations.	Innovation coaching. All types of mall and middle sized companies.	88
Innovation Express 2016	Developing of sustainable solutions and cooperation with companies from other countries. One project on circular use of textiles.	5
Innovation Express 2016, Paper Province	Paper Province, with focus on bioenergy and cooperation with companies in Denmark and Norway.	8
Innovation Express 2016, Water innovation Accelerator	Commercialization of innovative water solutions outside the Nordic countries.	19
Startup-Sweden	Coaching of digital companies in how to grow and develop by an one week "boot camp" about how to develop and finance a digital company.	40
Digilyft	Coaching small and middle sized industrial companies to increase the use of digital technology.	31

business partners; her business sectors; development project;

3.4 design of the wage subsidy

How the wage subsidy is implemented is of key importance in estimating impacts. Employers from all sectors in Sweden can already apply for generous subsidies from Arbetsförmedlingen (Arbetsförmedlingen, 2018) for hiring a person that has difficulties in accessing the labour market and many companies and NGOs in the recycling sector already use those subsidies.

Wage subsidy programs are frequently criticized for potential shortcomings, which can lead to negative effects that outweigh the positive aspects. One concern is that the subsidy may support a high share of eligible workers who would have been hired in any case. In this case, taking the potentially high deadweight costs into account, other active labour market measures can be more cost effective. Another concern is the so-called substitution effect, which means that firms increase their number of staff in response to the subsidy. Hiring workers eligible for wage subsidies can also lead to the firing of ineligible workers who have similar characteristics and can be easily substituted (ILO, 2015).

Since the sector already has the possibility to hire an employee with wage subsidies, this new subsidy must be more generous than the existing systems since there is no specific limitations for the textile sector to apply for subsidies today. There are several ways to accomplish a more generous subsidy, for example; lower requirements on the employee's difficulties to reach the labour market, longer periods with subsidies or a higher subsidy rate. We have decided to calculate a wage subsidy with the same subsidy rates as today but with 5000 SEK extra a month for each employee within the circular fashion sector. In that way we can use systems already in place. We have also set a maximum level of 2500 employees that can receive the subsidy.

Critical factors in the design

According to Watson et al (2017) care needs to be taken in the design of wage subsidies to ensure that companies do not misuse them. Eligible business operations need to be carefully listed and justified using green economy arguments. Vetting of businesses against these criteria will need to be carried out in a way that guards against cheating but avoids excessive bureaucracy.

Subsidies should only be available for long-term unemployed or disadvantaged groups. For long-term unemployed subsidies should be dependent on staff being trained to increase their fitness for the labour market. Governments should also consider carefully the time-length and review period of subsidies to ensure that they are not abused by companies to avoid collective wage agreements with trade unions.

3.5 design of the start-up/transition funding

In order to get a realistic idea of how to design this policy instrument we met with Johanna Giorgi at the Swedish Agency for Economic and Regional Growth. After discussions with her and her colleagues we decided to suggest a policy instrument design as follows:

- The Swedish Agency for Economic and Regional Growth propose applying tight criteria to the evaluation of applications and also during the administering of funds and management of projects. The companies develop a detailed project plan with objectives, milestones and key results. Final funding should be dependent on achieving these results. They suggest matched funding of 50 percent for the companies.

- The cost must cover cost for development of the companies' business models, including advice from external consultants.

- The funding will be about 250 000 SEK for each company in total.

The application process for funding from the start-up/transition funds needs to be transparent and straightforward. If the application process is too bureaucratic and complex, entrepreneurs will not find it worthwhile and resource efficient to apply for funding.

3.6 design of the knowledge hub

A knowledge hub must be easily accessible, in order to be able to support existing and potential entrepreneurs. The information and knowledge provided by the hub must be easy to understand and communicated through different communication channels. The hub needs to provide on-line information and expertise via a website, but could also be complemented with physical meeting locations. Much information and tools can be provided via a website, but face-to-face meetings assist in idea generating, sharing of experiences and inspirational seminars etc. (Watson et al, 2017)

The hub should, via professional and unbiased staff or consultants, provide information and expertise on how to run a business, e.g. business planning, rules and regulations, and provide access to a network of entrepreneurs in the same business area. The hub should provide updated knowledge on successful business models for second-hand businesses, leasing schemes, repair services and other business models that extend active lifetimes of textiles (and other products). Good cases, dos and don'ts, and interactive tools for assisting in choosing between model types, setting prices etc. would be useful. Furthermore the hub could provide information on available funding schemes (such as the one proposed above), assistance on how to apply, and relevant policies and measures. The hub should function as a one-stop shop and provide the necessary information and support in order to start-up or transform to a greener business model (Watson et al, 2017).

The Agency for Economic and Regional Growth suggests both a broad approach as described above that will reach a wide range of companies (100+) and more concentrated training for about 10 companies.

'the wage subsidy might be seen as a "label" on whether or not a company is sustainable, which, in turn, could create tensions between sectors within the industry'

4 impact assessments 4.1 wage subsidy

Affected actors

A wage subsidy on reuse, shared use and prolonged life time of textiles would affect the companies receiving the subsidies, the new subsidised employees; existing employees; and the quantity of textiles whose lifetimes are extended thus reducing the production of new textiles. The wage subsidy will also have impacts on the job market's function. Government budgets will be affected by both the cost of the subsidy itself and associated administrative costs.

Effects on companies

According to data from Statistics Sweden (2018) there are nearly 16 000 textiles and clothing companies in Sweden. See table 3.

Table 3. Number of companies in the clothing and textile sector (from Statistics Sweden 2018)

	Number of employees					
Sub-sector	0 1	1-9	10-49	50-199	200-	Total
Clothing industry	1552	185	14	2	0	1753
Wholesale and trade of clothing ²	1105	569	83	14	2	1773
Clothing shops	2134	1935	181	37	24	4311
Market trade, clothing and textiles ²	173	8	0	0	0	180
Clothing rental ³	84	31	5	0	0	121
Repair of clothing and textiles ³	139	24	1	0	0	164
Second hand, clothing and textiles ²	298	86	20	2	1	406
E-trade, clothing	2008	264	27	6	0	2305
Textile industry	1580	392	62	17	1	2052
Textile shops	927	439	29	1	2	1398
Wholesale of textiles	517	268	43	1	0	829
Clothing and textile design ⁴	400	19	2	0	0	421
Total	10916	4219	466	80	30	15711

1. Companies with no paid employees e.g. a single self-employed person or a partnership of owners 2.50 percent of a bigger group of companies that focus on both textiles and related goods. 3.20 percent of a bigger group of companies that focus on all sorts of consumer products.

4.10 percent of a bigger group of companies that focus on all sorts of consumer and industrial products.

The figure is calculated from data where companies focusing on other products are also included. See footnotes. Most of the companies report having no employee i.e. only self-employed owners or partners. Companies with at least 1 employee total about 5000. Companies in Sweden can already apply for generous subsidies for hiring a person that have difficulties to get into the labour market. We have therefore calculated the effects of a subsidy as of today plus 5000 SEK a month for each employee. We don't have any figures on how many of the 160 000 (Arbetsförmedlingen, 2018) people in Sweden that already have a wage subsidy, work with reuse, shared use and prolonged life time of textiles.

Table 4. Estimated number of subsided employees per company after policy measure

Scenario	Number of textile companies with at least 1 employee	Number of employees with a wage subsidy after the reform	Number of employees with a wage subsidy per company before the reform	Number of employees with a wage subsidy per company after the reform
250 people with subsidies work in the sector today	5 000	2 500	0.05	0.50
500 people with subsidies work in the sector today	5 000	2 500	0.10	0.50
1 000 people with subsidies work in the sector today	5 000	2 500	0.20	0.50

The result for the sector will be a rise in the number and the share of employees with wage subsidies. This will make it cheaper for the company to employ but will also affect the companies in other ways. It will be comparatively more expensive to employ people with the right skills. Lower skilled workers may make up a greater share of the companies' workforce.

Costs to government

Wage subsidies are expensive. Here we will only count the extra cost (5 000 SEK a month) for each employee since the other part of the wage subsidy is on the same level as today. As Table 5 shows, the extra cost for the government will be 150 million SEK a year. There will be increased administrative cost as well. We have no data for this cost but estimate it to be 25 million SEK which correspond to 10 000 SEK per employee with subsidies. The relatively low cost is due to the fact that ordinary routines will be followed. The total extra cost for the government will be around 175 million SEK a year.

Table 5. Governmental cost for the wage subsidy

Number of peop with the extra w subsidy	le The cost for the age extra subsidy a year per person	Extra wage subsi- dy payment a year totally	Extra administrati- ve cost
2 500	60 000 SEK	150 000 000 SEK	25 000 000 SEK

Environmental effects

Here we take the wage subsidies in Flanders as a potential model for potential effects in terms of volumes of textiles. In Flanders 4 200 employees with wage subsidies in the "Kringloop" processed 73 784 tonnes of potentially reusable goods from citizens and businesses (Komisie, 2017). Of the 73 784 tonnes 13 193 tonnes were textiles, and of these approximately 3 200 tonnes were sold on the domestic market. This is equivalent to 0.76 tonnes textiles per employee per year. 2 000 new people with a wage subsidy⁵ could, theoretically if working in the same sector, collect, process and sell 1 500 extra tonnes textiles on the second hand market each year. If we assume a 1:1 replacement rate of new clothing with used clothing this would result in a decrease of 1 500 tonnes of new textiles put on the market.

This is roughly 1.1 percent of the total volume of new textiles placed on the market each year in Sweden and assumes that there is a sufficient market for these services and business models which does not seem unreasonable. It should be noted that the workers in the Flanders example, don't only work with textiles but also with other used goods. If they solely work in collecting, processing, repairing and resell of textiles they could perhaps process higher volumes.

The model and estimates for volumes of new textiles avoided is only applicable for organisations working in the second-hand and the repair sector. Wage subsidies for workers working in leasing, clothing libraries, and other sharing models may have a very different effect since the volumes processed per worker may be very different for these businesses. Here we have only some qualitative assessments from the various types of businesses.

The interviewees' general perception is that this policy instrument will enable companies engaged in business models promoting reuse, collective use and prolonged life time of textiles to start employing staff or to increase the current staffing levels. In this regard the wage subsidy is seen to free economic and human resources to develop the business model. The interviewees believe that this, in time, would lead to growth in both size and numbers of businesses working with sustainable business models.

^{5.2500 - 500 = 2000} according to the middle scenario.

It is argued that more employees or paid man-hours in the interviewed companies would allow for e.g. extended opening-hours, which would increase customer access to sharing/ renting services and reduce waiting hours. Furthermore this would allow companies to expand their repair service, which would result in more repairs and higher turnover. More time could be spent on developing producer contacts and cutting costs, developing new products and services as well as knowledge sharing.

Social effects

The measure will not increase the number of people with wage subsidies in Sweden, but instead reallocate them to the textile sector from other sectors by the extra 5 000 SEK subsidy a month for each employee. We believe that this reform might be a possible way for in particular immigrant workers with skills in the textile industry, e.g. tailors and seamsters, to reach the labour market.

The majority of the respondents in the interview study estimate that none of the policies would affect their working conditions in any important way. Most of the interviewees' state that the policy measures would mostly make new hiring possible but would not affect working conditions. One interviewee commented that they already have good working conditions today, and are not planning on changing them. A few did state, however, that the policy would improve working conditions e.g. increase the hours of employment (from part-time to full-time).

Acceptance

Most interviewees think that the wage subsidy would have a high level of acceptance in the textile sector at large. However, questions were raised regarding what companies would be eligible for the subsidy and what criteria would be used to determine this. Moreover questions were raised regarding the risk of "envy" (i.e. non-acceptance) from established conventional textile companies. It was put forward that the wage subsidy might be seen as a "label" on whether or not a company is sustainable, which, in turn, could create tensions between sectors within the industry.

When it comes to acceptance from decision makers, the interviewees expressed different views. Some thought that policies targeting creation of green jobs would be widely accepted by politicians. Others argued that (wage) subsidies could be a sensitive issue as strong lobbyists in the traditional fashion industry might be negative. Finally, some of the company representatives thought that the cost of the wage subsidy could make it (politically) hard to implement.

4.2 knowledge hub

Affected actors

A knowledge hub will mainly affect the companies that make use of it and the agency that hosts it. If the knowledge hub succeeds in helping the participating companies to grow and develop, the knowledge hub will also contribute to more circular solutions on the market for consumers.

Effects on companies

The Swedish Agency for Economic and Regional Growth suggested, based on experiences from other knowledge hubs, that one can expect that approximately 100 (+) companies would be reached by some information activity organized by the knowledge hub and that somewhere in the region of 25 companies would take a more active part in the knowledge hub's program.

According to data drawn from SCB's register of companies, there are about 15 000 companies that produce, sell, design, rent or repair clothes or textiles in Sweden year 2017. See Table 3. About 5 000 of those have at least one employee. That means that the hub would reach about 2.5 percent of the clothing and textile companies with at least 1 employee.

Companies taking part in a program organized by Swedish Agency for Economic and Regional Growth generally agree with the statement that they have gained in competitiveness due to the programs (Swedish Agency for Economic and Regional Growth, 2017). However, the effects will be different for different companies; some will gain a lot while others will be unaffected. Generally, since this types of program can only increase the knowledge of the participants, but not change the market their companies meet, the effect may be limited.

Companies that took part in an intensive learning program increased their turnover with 16 percent compared to a control group (Swedish Agency for Economic and Regional Growth, 2018a). Since our proposed knowledge hub is a less intensive program we suggest a conservative increase of 3 percent of the turnover for companies (100 +) that take part in one information activity organized by the hub and an increase of 10 percent for the 25 companies that take part of a longer knowledge hub program (see Table 6).

Those conservative assumptions are in line with the interview study where only two companies out of eleven expected the proposed knowledge hub to increase the turnover of their companies (see Figure 3).

How the impacts of a Knowledge Hub scenario were evaluated by the interviewed companies is highly dependent on how they imagine the hub to function and what it would offer. Interviewees differed widely in their perceptions.

Table 6. Estimated number of companies participating in proposed knowledge hub activities, the assumed effect on turnover and their share of the total number of companies in the sector

	Number of companies	Assumed effect on turnover	Total share of the 5000 companies in the sector with at least 1 employee
Take part in at least 1 knowledge hub activity	100	3 %	2 %
Take part in a longer knowledge hub program	25	10 %	0.5%
Total	125		2.5%

At one end of the scale it was perceived as a hub that would be highly dependent on intensive participation and knowledge sharing by companies that may not have the time nor get enough in return. At the other end of the scale, it was seen as a hub with expert staff and PR-resources that could help new start-ups into the market, raise attention amongst consumers and expand customer knowledge and interest.

Costs to government

The Swedish Agency for Economic and Regional Growth or similar would likely host the knowledge hub. Experts there estimate a cost of approximately 3 million SEK a year (Swedish Agency for Economic and Regional Growth, 2018b). This budget includes costs for external consultants, project leaders and overhead costs.

Environmental impact

It is difficult to calculate the environmental impact of a knowledge hub for many reasons. The following calculation is done using available data and as reasonable assumptions as possible. Companies with a turnover that equal to 0.2 to 0.5 percent (See table 6) of the sector's turnover participate in the knowledge hubs activities and as a result increase their turnover with 3 percent and 10 percent respectively, and as a result reduce traditional clothing and textiles companies turn over with the same amount.

We also assume that the knowledge hub's companies' business models double the lifetimes of textiles compared to traditional clothing companies. This will result in a decrease of the textile consumption with 0.006 and 0.005 percent respectively a year. In 2016 138 000 tonnes of new clothes and household textiles were put on the Swedish market (Statistics Sweden, 2017). As a result the knowledge hub would reduce the textile consumption by about 75 tonnes a year (see Table 7).

Table 7. The knowledge hub's estimated effects on new textile put on the Swedish market

	Total share of the 5000 companies in the sector with at least 1 employee	Assumed effect on turnover	Effect on the consumption in percent:	Assumed effect on new textile put on the market
Take part in at least one activity	2 %	3 %	-0.006 %	-40 tonnes
Take part in a longer knowledge hub program	0.5%	10%	-0.005 %	-35 tonnes
Total	2.5%		-0.011 %	-75 tonnes

Social effects

The approximately 35 companies who would participate in the knowledge hub program would increase their turnover. Companies with more traditional business models may decrease their turnover accordingly. Most of the business models that extend textile product lifetimes are service heavy, with the service employees being located close to the consumer. This includes repair, leasing, clothing libraries and other sharing, collection, processing and resale. Traditional linear textile business models, on the other hand, lead to a heavy share of employment in textile production countries in Asia. Therefore, the overall effect is likely to be an increase in jobs in Sweden potentially at the expense of jobs in Asia.

Acceptance

Most of the interviewed businesses regarded the proposed Knowledge Hub positively, although many see it more as "a bonus" and not the most important policy of those suggested. Only two saw it as a very important policy measure.



Figure 3. Number of interviewees that expect different policy instrument to affect their turnover positively the suggested policies to impact their company's turnover.

The Knowledge Hub was generally seen as easily accepted within the textile industry. It was also regarded as more accepted by decision-makers and less controversial among these than the proposed wage subsidy.

Conclusions

One important weakness to this policy instrument is few participants compared to the total number of companies in the sector. This instrument will be better as a compliment to another policy instrument instead of standing alone.

4.3 start-up/transition funding

Affected actors

Affected parts of this policy instrument will be the companies that get funding, and national administrations that will be subject to increased costs.

Effects on companies

Companies in all sizes participate in this type of program. However, according to experiences from similar programs with a relatively narrow scope in terms of types of businesses that can apply (here textile companies working in extending lifetimes of textiles) the Swedish Agency for Economic and Regional Growth estimate that only about 10 companies would adequately apply for and receive start-up/transition funding. The relatively low number is a result of the high resources required in the companies to apply for and administer the funding and the requirement for matching funding (50%) from participating companies. Since there are about 5 000 companies in the sector with at least 1 employee (see Table 3) this measure might therefore reach about 0.2 percent of the sector.

According to data from the agency (Swedish Agency for Economic and Regional Growth, 2018a) this type of measure leads to an increase in turnover for the participating companies of about 17 percent compared to 1 percent for a control group. These companies received from 50 to 250 000 SEK.

Effects on the environment

It is difficult to calculate the environmental impact of the start-up/transition fund of many reasons. However, if textiles companies that equal 0.2 percent of the sector's turnover participate in the program and the as a result increase their turnover with 17 percent, and as a result reducing traditional textile companies turnover accordingly, and we assume that the business models double the lifetime of textiles, the result would be that the consumption of clothing will decrease with 0.017 percent a year.

In 2016, 138 000 tonnes of new clothes and household textiles were put on the Swedish market (Statistics Sweden, 2017). As a result the start-up/transition fund with a budget of 3 million SEK could reduce the textile consumption by about 23 tonnes a year.

Social effects

The approximately 10 companies who participate in the start-up/transition funding program will increase their turnover. Companies with more traditional business models may decrease their turnover accordingly. Similarly to knowledge hubs, the overall effect is likely to be an increase in service-related jobs in Sweden at the expense of textile production jobs in Asia.

Costs to government

The Swedish Agency for economic and regional growth has estimated the cost for the start-up/transition fund to 4 million SEK where about 3 million are for the companies and 1 million for administration costs.

Acceptance

Almost all interviewees consider start-up funding as having the effect of increasing the number of companies involved in increased reuse, collective use and prolonged life-time of textiles. Start-up funding is generally seen as easily accepted to both textile industry in general and decision makers.

Conclusions

One important weakness to this policy instrument is the relatively few participants compared to the total number of companies in the sector. This instrument will be better as a compliment to another policy instrument instead of standing alone.

4.4 effects on consumer access and consumer behaviour for the policy instruments as a whole

More or less all respondents in the interview study evaluated that the proposed policies would increase consumer accessibility to business models focusing on reuse, collective use and prolonged life-time of textiles. A common theme in the answers of why this would be the case is the domino effect that it could start: more actors on the market would per se increase consumer accessibility to these kinds of products and services.

The interviewees estimate that especially the wage subsidy, but also the start-up funding and the knowledge hub to a lesser degree, would increase the number of actors providing these kinds of business models. An increase in the number of actors would lead to both geographical spread (e.g. making them available also in smaller cities and towns) and increase in opening hours.

Several respondents also mention that increased competition would lead to increased diversity in the services provided. An increase in actors and competition would open up for market positioning more "niches". The possibility of opening a branch focused on providing clothes for rent for men was mentioned by one respondent. This could also increase customer satisfaction, e.g. the chance that customer find products or service which suits them, which in turn would increase customer demand.

Several respondents argue that an increased number of actors and increased consumer awareness would lead to a higher level of "social acceptance" for using these kinds of services and products. Social acceptance, i.e. that it is seen as normal and hopefully "smart" and "modern" to use these kind of services and produces, is needed in order for increased geographical accessibility to have any effect.

'the knowledge hub is most cost effective due to low costs and a large potential number of participating companies'

5 discussion and conclusion

In this report we have assessed the environmental, social and economic impacts of implementing three policy measures in Sweden, for extending the active lifetime of clothing. The policy measures would act by assisting in the growth and spread of business models such as leasing, sharing, take-back and resell and repair that give clothing a second life or ensure that they are used by several consecutive users and thus offset new purchases. The assessed policy instruments are:

- A wage subsidy earmarked for businesses that extend the active lifetime of textiles
- A knowledge hub assisting businesses start up or transition to more circular models
- Start-up/transition fund for business models/initiatives that extend the active lifetime of textiles

These business models were selected from a pool of 10 assessed by Watson et al (2017). They were considered to be those that are best suited for implementation at national (Swedish) level and would have reasonably significant impacts while being relatively easily implemented and acceptable to both the textile sector and government.

The estimated impacts of the three selected policy measures are summarised in Table 8. The assessment found that all three measures would be relatively easily implemented and politically acceptable since they have similarities to measures that already exist in Swedish policy though without specific emphasis on the textile sector or on encouraging green business models.

Table 8: Summary of the impacts and cost effectiveness of 3 policy measures

	Effects on companies	Cost for the government	Environmental effects, less newly produced textiles put on the market each year.	Social effects/ acceptance	Cost for doubling the lifetime of 1 tonne textiles
Wage subsidy	About 2000 more employees with wage subsidies.	175 million SEK	1 500 tonnes	Can possibly contribute to integration Good	117 000 SEK
Knowledge hub	3 % increased turnover for 100 companies 10 % increased turnover for 25 companies	3 million SEK	75 tonnes	Good	40 000 SEK
Start-up/ transition fund	16 % increased turnover for 10 companies	4 million SEK	23 tonnes	Good	174 000 SEK

However, the wage subsidy was considered to have a lower acceptability in the textile sector itself, than the other two measures, due to more traditional companies feeling that they were disadvantaged by the scheme. The other measures do not carry such a risk since a company must actively engage with, and dedicate resources to them.

The need for dedicating resources and active engagement also leads to much lower penetration of the knowledge hub and start-up/transition funding in the sector with fewer companies making use of them than the wage subsidy. This gives a much lower environmental benefit at 75 tonnes and 23 tonnes of new textile purchases that would be offset, compared to 1 500 tonnes for the wage subsidy.

However, the cost effectiveness of the instruments - i.e. the cost of implementing or administering them per unit benefit - are more similar, ranging from 40 000 SEK to 174 000 SEK per tonne of offset new textile purchases and associated environmental benefits. The knowledge hub is most cost effective due to low costs and a large potential number of participating companies.

Offsetting the production of one tonne of new textiles comprising a typical mix of fibre types consumed in the Nordic countries, would lead to approximately 10 tonnes CO2equiv savings in greenhouse gas emissions⁶ . Thus, the three measures would have a CO2 offsetting cost of between 4000 and 17 400 SEK per tonne CO2equiv or, under current exchange rates, between 390 and 1700 Euro per tonne CO2equiv. This compares to around 10-30 Euros per tonne CO2 for a range of carbon offsetting funds⁷.

Seen purely in the context of carbon savings the three instruments would seem to have a very low cost effectiveness. However, they also lead to green job creation and a range of other environmental benefits. The wage subsidy can also lead to social, benefits if the subsidy is linked to employment of disadvantaged groups. This is the case for wage subsidies given to textile sorting facilities under the French extended producer responsibility scheme for textiles and shoes, and the wage subsidies for sorting, processing and sale of used product under the Flemish Kringloop scheme (Watson et al, 2018).

All three instruments have the capacity to contribute to a long-term change in the textile market. Moreover, they are highly compatible with one another and used together could provide relatively strong drivers for a transition to sharing, repair, leasing business models in the Swedish textile market. No negative effects are identified apart from the relatively low cost efficiency for government when purely seen as a carbon reduction instrument. All three instruments were viewed as being of reasonable or high acceptability to both government and the textile industry and relatively straightforward to implement.

One key obstacle to the business model transition is the low price of new garments imported from Asia and elsewhere, in part due to low wages in production countries and to low quality of clothing under fast fashion trends.

Options such as a resource tax and minimum durability standards were considered by Watson et al (2017) for tackling this obstacle. These options were not considered for further assessment in this report since they were viewed as being more suited to implementation at EU or global level. The Nordic Council of Ministers has, however, recently produced first draft EcoDesign Criteria for textile products that could be used to set thresholds for durability and product quality at EU level.

'all three instruments have the capacity to contribute to a long-term change in the textile market'

^{6.} Derived from Table 18 in Schmidt et al (2016), scenario for reuse of 1 tonne of Nordic mixed fibre clothing/textiles, with PE impact converted to CO2equiv savings

^{7.} See e.g. http://www.ecobusinesslinks.com/surveys/carbon-offsetting-price-survey/

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7. appendix 1 interview guide

The interview guide includes a short introduction from the interviewer, general introductory questions and specific questions regarding economic, environmental and social aspects. Introduction from interviewer:

- Explaining the reason behind the interview (input to qualitative assessment of • policy measures for increased reuse, sharing and prolonged lifetime of textiles as part of Mistra Future Fashion)
- Presentation of the three policy instruments. •
- Explaining that we start in general terms and then move on to more detailed ۲ questions

interview questions General [open introductory] questions

- 1. Do you think that this policy [specify which policy] will have an impact on increased reuse, sharing and prolonged lifetime of textiles ["gut feeling"]?
 - If yes: In what way? Positive/negative? •
- 2. Do you think that this policy [specify which policy] will impact your business ["gut feeling"]?
 - If yes: In what way? Positive/negative? •
- 3. How would you estimate/assess the acceptance for this policy [specify which policy]
 - In your company? •
 - Among other companies/organizations in the textile sector?
 - Among other companies/organizations in the second-hand/repair sector?
 - Among policy makers?

Economic aspects

- 4. How would your company benefit from this policy [specify which policy] - and to what extent [open introductory question]?
- Do you think this policy [specify which policy] will affect your turnover? 5.
- Yes/no? Please elaborate •
- If yes: Try to estimate how much (% change) in 1 and 5 years? •
- Do you think this policy [specify which policy] will affect your profit? 6.
 - Yes/no? Please elaborate •
 - If yes: Try to estimate how much (% change) in 1 and 5 years?
- 7. Do you think this policy [specify which policy] will affect your business model (e.g. higher acceptance, tipping point, snowball effect, increased competition, changed consumption patterns etc.)?
 - Yes/no? Please elaborate
 - If yes: Try to estimate to what extent (small, medium, large effect?

- Do you think this policy [specify which policy] will affect the number of 8. companies/actors in this sector (i.e. competition)?
 - Yes/no? Please elaborate
 - •
- 9. on the market?
 - Yes/no? Please elaborate •
 - If yes: Try to estimate to what extent (small, medium, large effect)?
 - If no: What would be necessary instead?
- 10. consumers using this type of business model (change consumer patterns)? Yes/No Please elaborate •
 - •
- 11.
 - Yes/no? Please elaborate •
 - If yes: To what extent (small, medium, large effect)?

Environmental aspects

- Do you think this policy [specify which policy] will affect the active lifetime of 12. user)?
 - Yes/No? Please elaborate
 - If yes: How?
 - 25% etc.)?
- 13. textiles, i.e. by subsequent user/reuse rate? Yes/No? Please elaborate .
 - If yes: How? Will it increase reuse in Sweden?

 - secondhand of total textile consumption in 2013 app. 19%)?
 - If yes: How will it affect the quality of the second hand clothing?
- 14. Do you think this policy [specify which policy] will affect the collective use of textiles?
 - Yes/No? Please elaborate •
 - If yes: How?
 - 25% etc.)?
- Do you think this policy [specify which policy] will affect transports regarding 15. both a) transport of consumers for consumption and b) transports of the consumed products?
 - Yes/No? Please elaborate
 - If yes: How (e.g. type of transports, frequency, distance etc.)?
 - If yes: To what extent (small, medium, large effect)?

If yes: Try to estimate to what extent (small, medium, large effect)?

Do you think this policy [specify which policy] will affect the possibility of (new) companies/actors engaged in these kind of business models to enter and/or stay

Do you think this policy [specify which policy] will affect the number of users/

If yes: Try to estimate to what extent (% change) in 1 and 5 years.

Do you think this policy [specify which policy] will affect your exports/imports?

textiles, i.e. usage of the textile in course of its total lifetime (by firs or subsequent

If yes: Try to estimate how much compared to the current situation (e.g. double,

Do you think this policy [specify which policy] will affect the (actual) reuse of

If yes: Try to estimate how much compared to the current situation (e.g. %

If yes: Try to estimate how much compared to the current situation (e.g. double,

- 16. Do you think this policy [specify which policy] will affect your internal environmental work (e.g. product, performance, processes)?
 - Yes/No? Please elaborate
 - If yes: To what extent (small, medium, large effect)?

Social aspects

- 17. Do you think this policy [specify which policy] will affect your number of employees?
 - Yes/No? Please elaborate
 - If yes: How?
 - If yes: Try to assess to what extent this will affect you
 - i. one more employee
 - ii. 2-5 more employees
 - iii. 5-10 more employees
 - iv. more than 10 more employees
- 18. Do you think this policy [specify which policy] will affect your working conditions?
 - Yes/No? Please elaborate
 - If yes: In what way (e.g. it will enable us offer higher wages)?
 - If yes: Try to assess to the effect (small, medium or large effect)
- 19. Do you think this policy [specify which policy] will affect your employees competence/level of education (e.g. your opportunities to provide on-the-job-training)?
 - Yes/No? Please elaborate
 - If yes: In what way (e.g. it will enable us offer more training)?
 - If yes: Try to assess to the effect (small, medium or large effect)
- 20. Do you think this policy [specify which policy] will affect the accessibility for consumers of these types of business models?
 - Yes/No? Please elaborate
 - If yes: how?
 - If yes: Try to assess to the effect (small, medium or large effect)
- 21. Do you think this policy [specify which policy] will affect employee and/or consumer health and safety?
- Yes/No? Please elaborate
- If yes: Try to assess to the effect (small, medium or large effect)
- 22. Do you think this policy [specify which policy] will affect income distribution and social inclusion?
 - Yes/No? Please elaborate
 - If yes: Try to assess to the effect (small, medium or large effect)



Mistra Future Fashion is a research program that focuses on how to turn today's fashion industry and consumer habits toward sustainable fashion and behavior. Guided by the principles of the circular economy model, the program operates cross disciplinary and involves 60+ partners from the fashion ecosystem. Its unique system perspective combines new methods for design, production, use and recycling with relevant aspects such as new business models, policies, consumer science, lifecycle-assessments, system analysis, chemistry, engineering etc.

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