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Public procurement of reconditioned furniture and the potential transition to product service systems solutions

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Abstract

The transition to a circular economy requires the development of new business models. However, 'circular' businesses face a number of barriers when competing in the current 'linear' economy, and may require the support of public policies. Public procurement may be applied for this purpose, as it can support emerging markets for reconditioned and remanufactured products. Public procurement can also support durable and upgradable products through functional procurement and leasing solutions, thereby promoting product-service systems (PSSs). One product category of high relevance is office furniture, as the purchasing of reconditioned furniture can implicate both environmental and monetary savings for contracting authorities. This study investigates the potential of public procurement to increase the volumes of reconditioned furniture in Sweden and identifies the main drivers and barriers for increasing such practices. The main data collection strategy was semi-structured interviews with furniture reconditioners and public procurement officers. The potential for supporting PSSs through furniture leasing was also analyzed. The main conclusions are that there is significant potential to support furniture reconditioning and PSS solutions through public procurement, especially through the establishment of larger framework contracts and involving furniture manufacturers, but several barriers need to be overcome. Primarily, training and education of public procurers and updating of procurement criteria can facilitate the introduction of reconditioned furniture in purchasing considerations. Moreover, the sector needs to improve its visibility, marketing, and cooperation with public authorities. Finally, functional procurement through PSSs seems unlikely, as it is still quite unclear how the procuring authorities can process the associated contract requirements.

Keywords: Furniture Reconditioning; Public Procurement; Resource Efficiency; Circular Economy; Product-Service Systems

1. Introduction

There is a growing political consensus in the European Union (EU) pointing at the need to shift the current linear economic system to one that is aiming at closing material loops – the so-called circular economy (CE) [1]. Thus, it is imperative to move up the waste management hierarchy and promote waste prevention through designing more durable products, and stimulating the re-use, repair, remanufacturing and refurbishment of products. According to Planing [2], four building blocks are vital for the transition to a CE: (a) materials and product design; (b) new business models; (c) global reverse networks; and (d) enabling conditions, including public policies. Public policies are necessary for this transition due to existing barriers in the current system – including institutional, organizational, behavioral, technological and market-based barriers [3]. A review of existing and proposed policies for advancing CE identified three policy areas that could potentially have a high impact on CE, namely: 1) reuse, repair and remanufacturing policies; 2) green public procurement and innovation procurement; and 3) policies for improving secondary materials markets [4].

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Several European countries have implemented or are planning to implement procurement strategies for the CE [5]. In Sweden, which is considered one of the most progressive EU countries when it comes to green public procurement (GPP) [6], there are examples of interesting practices in place. These include procuring bio-based healthcare products [7], and the purchasing of larger volumes of remanufactured ICT products by municipalities, for use in primary and secondary-level schools and for administrative staff [8]. There are also examples of municipalities that have started up functional procurement that supports PSS solutions, such as procurement of lighting in schools as a service (procuring 'light' instead of lighting products) [9].

Office furniture constitutes an interesting product group from a CE perspective, as it is expensive, durable, and there is a high potential for reconditioning of used furniture to "as new" quality, through for example, textile washing and changing of frame parts or textiles. Over one million office furniture pieces are discarded each year in Europe [10], and if some of these could be reconditioned and re-used, then this would represent significant environmental gains and monetary savings for the procuring agencies since reconditioned furniture is sold at approximately 50-80% of the price level of new furniture [11]. Furthermore, the public sector purchases large quantities of furniture so the potential impact of public procurement could be substantial. Currently, reconditioned furniture accounts for a small part of the total procurement.

In Sweden, various green criteria have long been applied in public procurement of furniture by regional agencies and municipalities [7]. Sustainability criteria have been developed for a number of issues such as chemicals in the furniture and its production processes, recycling potential, and raw materials, including the promotion of sustainably sourced wood. GPP practices have expanded in conjunction with the emergence of different ecolabels and certification schemes for furniture (e.g., the Nordic Swan and Möbelfakta), and since national guidelines on GPP for furniture have been developed by the National Agency for Public Procurement (Upphandlingsmyndigheten). In the last couple of years, new strategies have been promoted in the public sector to address furniture procurement, aiming to increase furniture life span and intensity of use. Firstly, municipalities and regions have started up re-use/sharing systems, where departments that need new furniture can check if there is surplus furniture in other departments so they can avoid new purchases [12]. Further, in some cases, agencies have procured reconditioned furniture. There is also a growing interest in purchasing reconditioned furniture and in leasing furniture instead of buying. In a recent survey of public procurers conducted by the Legal, Financial and Administrative Services Agency (Kammarkollegiet) – the Swedish agency that arranges large framework contracts for public procurement – about 45% of procurers expressed interest for purchasing second-hand products, and 20% expressed interest for furniture leasing instead of buying [13].

2. Objective, methods and outline

Typically, public procurement uses criteria developed for new products on the market. Contracted furniture suppliers deal primarily or exclusively with new products. This poses a challenge for any agency that aims to procure reconditioned furniture. Further, existing furniture reconditioners are small companies, and therefore there is a potential matching problem: public agencies want furniture that is similar in appearance and tend to procure large volumes, but small reconditioners may not be able to keep large stocks of uniform furniture unless they are sure they can sell the furniture. Such matching problems are common in emerging product markets.

There is limited research on drivers and barriers for increasing the markets for reconditioned furniture, and most likely public procurement offers the largest potential to quickly increase the market volumes. Therefore, this research aims at 1) examining the barriers and drivers for the market for reconditioned furniture, and 2) analyzing the potential for public procurement as a driver for this market.

The main method for data collection has been interviews with 1) furniture reconditioners and 2) officers at public procurement agencies as well as procurers in municipalities that are familiar with the procurement of furniture. The term 'reconditioner' refers to a business entity with its primary activity being the sourcing of used furniture, its reconditioning (including repair – minor or extensive – of the furniture, washing, cleaning, and testing) and returning the furniture back to the market for a second life. All reconditioners that could be identified in Sweden were contacted, and five were interviewed. The staff at agencies were identified through internet searches, and a few additional potential interviewees came up through the 'snowballing method'. The interviewees' affiliations and positions are listed in Table 1.

Table 1. List of interviewed stakeholders

Stakeholder groups	Interviewed entities – interviewees
Furniture reconditioning companies	Soeco Kontorsmöbler AB – Co-owner, founder
	Recycling Partner AB – Marketing director
	Rekomo AB – Co-owner
	Vican AB – Managing director
	Silfvenius & Åhström Kontorsutvecklarna – Co-owner, founder
Public authorities' procurement staff	Ystad municipality – Head of procurement
	Lund municipality – Head of procurement
	Flen municipality – Controller, procurement
	City of Malmö – Procurement officer
	Nacka municipality – Head of service unit
	National Agency for Public Procurement – Lawyer
	National Agency for Public Procurement – Head of unit, sustainability support
	SKL Kommentus (procurement support center for the public sector) – Officer responsible for office equipment and furniture

An interview protocol was established and used as a basis for the interviews. The protocol was adjusted depending on the interviewed actors. The questions were clustered into themes, and for procuring agencies, the themes related to drivers and barriers for furniture reconditioning, and the existing and potential future role of public procurement to stimulate the market. The interview themes for furniture reconditioners were related to their business models, their competitors, their customers, the development of the sector, and whether they had noticed an increasing demand from the public sector for reconditioned furniture. The reconditioners were also provided with a number of 'barriers' for their business – these barriers were identified through the literature and initial discussions with stakeholders – and were asked to put a number on their importance (1 being the least important, 5 being of highest importance). Then, they were asked to do the same numbering for a list of possible policy interventions, judging how much these policy interventions would support furniture reconditioning (1 means that the policy would be of little support for their business, 5 that it would be very beneficial for their business). The potential policy interventions were identified through the literature and preliminary discussions with relevant stakeholders.

The following section accounts for the main results of the study. Section 4 advances the discussion by examining if furniture leasing can be used as a complement to purchasing reconditioned furniture. The main reason for this discussion is that while public procurement of reconditioned furniture has environmental benefits, reconditioners are independent of the original equipment manufacturers (OEMs) of furniture, and therefore current procurement practices will probably not provide incentives for OEMs to design more durable or upgradeable furniture. Leasing could stimulate PSS-oriented solutions and lead to design changes, and stimulate take-back schemes. The paper ends with the conclusions.

3. Results

In this section, we present the results from the interviews, by stakeholder group. First, we elaborate on the data collected from the furniture reconditioners, and then we follow with the results of the public officers' interviews.

3.1 The reconditioners

The five interviewed reconditioners all sell second-hand and reconditioned furniture, and they also lease out furniture. They only deal with 'design furniture', i.e., high-quality furniture. The reconditioning activities include repairs, washing, applying new textiles, and the montage of parts. One of the companies manufactures new furniture, in addition to its reconditioning activities.

They source the furniture through different strategies, including through direct business contacts, from companies that relocate offices, or through moving companies. The quality of the furniture is decisive for the business transaction: the reconditioners are willing to pay for high-quality furniture, but they charge money for collecting furniture of lower quality. For medium-quality furniture, the reconditioners often pick up the furniture for free but do not pay for it.

The companies' main competitors are other reconditioners and manufacturers of new furniture. Some of the interviewed reconditioners could take on bigger projects than others in their region, and therefore did not experience direct competition. Furniture manufacturers have traditionally seen the reconditioners as competitors, but recently, greater interest for cooperation has started to develop. For instance, the reconditioners can take care of furniture that has been used in exhibitions that cannot be sold as new. Further, when a customer specifically wants to be able to purchase both new and used furniture, the reconditioners can become sub-suppliers to OEMs who can only supply new furniture. There is also competition from relocation assistance companies. Some reconditioners state that such companies would not always be necessary as they could pick up furniture themselves instead.

Regarding *barriers*, all interviewees agreed that the biggest barriers for scaling up the market for reconditioned furniture are the way public procurement is currently applied. A first barrier was the rules and the process of setting up contracts. Often, current public contracts do not allow for reconditioned furniture due to criteria applied, which means that new agreements must be set up, which takes time. A related problem is that procurers in the public sector do not realize that the reconditioners can supply large volumes of furniture that are similar in appearance; thus, they fear that they will receive furniture that does not look similar in appearance. Therefore, the procurers must often go to the reconditioners and see the furniture stock in order to realize the significant volume on offer. Generally, the interest for procuring used furniture is increasing in the public sector, and the interviewees stated that this is usually due to environmental reasons, not to a motive to cut costs in the public sector. The interviewees were also asked to rank a number of other barriers related to their business operations; cf. Figure 1.

Fig. 1. Respondents' ranking of perceived barriers to increasing the volumes of reconditioned office furniture. The y-axis shows the number of respondents, and the x-axis shows the ranking from 1-5.

The perceptions differed concerning the barriers, and the reasons for the different responses seem to be the fact that the reconditioners have different customers. As an example, some of the customers were willing to purchase reconditioned furniture, whereas others may prefer new ones.

Regarding *potential ways to scale up the market*, the interviewees stated that the reconditioners need to cooperate more and to market themselves better. They also need to cooperate more with the public sector and display examples of how money can be saved through purchasing used equipment. Further, some interviewees stated that public procurers need to start thinking about what resources still have value that can be used again, and not to buy new without proper analysis.

The interviewees were also asked to rank potential policy interventions (Fig.2) that would help them lift the identified barriers presented in Figure 1.

Fig. 2. Respondents' ranking of desired policy interventions for increasing the volumes of reconditioned office furniture. The y-axis shows the number of respondents, and the x-axis shows the ranking from 1-5.

Changes in public procurement practices are considered the real game-changer here; all reconditioners ranked this policy intervention as a ‘5’. Just as in the case of barriers, the interviewees had quite different opinions regarding other policy interventions. For instance, while raising raw material prices could make reconditioned furniture more attractive, it could reduce the total amount of new furniture on the market, which may affect reconditioners in the future; new furniture on the market is a precondition for reconditioning at a later stage. One interviewee stated that one important policy could be a ban against throwing away furniture before it had been inspected to see if it could be re-used or reconditioned. There were also claims that furniture manufacturers (OEMs) throw away some used furniture to avoid a situation where reconditioned furniture could take up a larger share of the market, at the expense of new production.

All interviewees except one had seen a clear increase in the demand for reconditioned furniture in the last couple of years, and several interviewees thought the business could grow quickly, both in Sweden and in neighboring countries. Some interviewees also thought that reconditioning would become an established practice within the furniture sector and that OEMs would increasingly design furniture that is easier to repair. However, other interviewees claimed that the furniture business was quite traditional in its approach and that the developments could be quite slow.

3.2 The public sector

Interviews were conducted with staff at five municipalities and two other public organizations. The five municipalities interviewed had all purchased reconditioned furniture through public procurement processes, but the value of these contracts varied significantly. The main reasons for procurement of reconditioned furniture were reduced costs and environmental reasons. One municipality stated that they expected to purchase higher volumes of reconditioned furniture in the near future.

Regarding *benefits of reconditioned furniture*, all interviewees agreed that there were significant cost savings, and also stressed the environmental benefits. Further, the fact that the products are cheap, and often delivered quickly, can also contribute to having more flexible offices; flexibility costs less than if new furniture must be purchased when changes are made in the office environment. One interviewee also stressed that local/regional jobs and skills are supported when purchasing reconditioned goods.

Regarding *disadvantages with reconditioned furniture*, the most important issue is that there is limited knowledge about the materials and chemical content in older furniture, and no established methods to examine this exist. In some cases, it is uncertain if the furniture is fireproof. It was stated that there are certain departments and functions where these issues are very important, whereas they are less relevant in other departments. Other disadvantages included the problem in finding enough homogenous furniture – as the reconditioners may not be able to supply enough volume of pieces with similar aesthetics – which affects the potential to plan office space well in advance. Finally, uncertainty regarding lifetime and guarantees is greater for reconditioned furniture than new.

Among the *experienced barriers* that reduce the possibility to procure reconditioned furniture, the interviewees referred to the following issues:

- The existing contracts for furniture, which relate to new furniture.
- Uncertainties if it is legally allowed to purchase reconditioned furniture.
- The sustainability criteria currently applied when purchasing furniture – e.g., chemical content – are easier to comply with for new furniture.
- Uncertainties regarding the product quality when purchasing reconditioned goods.
- It is more difficult to evaluate offers related to reconditioned furniture than new furniture, especially if a large number of furniture with similar appearance is hard to guarantee in the contract.
- There are too few furniture reconditioners, and they have not been good at marketing their sector and their products.
- In many big procurement contracts, an OEM has to be involved (some of the furniture must be new) but there is space for reconditioned furniture as well; this requires more advanced contracts.
- The standards applied in procurement are designed for new furniture.

Regarding *potential measures* that could support public procurement of larger volumes of reconditioned furniture in the future, several issues were proposed by the interviewees:

- There must be more cooperation among public authorities to spread best practice. Resources must be invested in education and development of new practices.
- The sector of reconditioned furniture needs to market itself better.
- The supply of reconditioned furniture needs to grow so larger volumes of uniform furniture can be guaranteed. The public sector cannot procure larger volumes unless there is a certainty that these can be delivered.
- The advantages of reconditioned furniture must be better communicated to public procurers.
- Methods to trace chemicals in reconditioned furniture need to be developed.
- The OEMs should engage more with the reconditioning of furniture.
- When the public sector purchases new furniture, it must be of the highest quality, because only high-quality furniture is suitable for reconditioning.
- It is important that new public contracts include both new and reconditioned furniture. This is especially the case for larger contracts, e.g., governmental framework contracts that all governmental agencies can use, or in cases where several cities make a joint procurement.

The interviewees were optimistic concerning the potential to purchase larger volumes of reconditioned furniture in the future, and one of them even thought that reconditioned furniture could be up to 50% of the future procurement volumes. Some interviewees stressed that the municipalities could influence the market conditions through 1) identifying opportunities to sell used furniture to reconditioners, 2) better control of the furniture they handle in waste collection systems, and 3) requiring high quality and durability when purchasing new furniture.

4. Analysis

Clearly, both the reconditioners and the public actors consider public procurement to be a potential game-changer, which could support a rapid scaling up of the volumes of reconditioned furniture. When it comes to other barriers and drivers for the sector, the reconditioners had quite diverging views on their importance, and there were also different opinions concerning how quickly the market will grow in the coming years. This is probably because they have different customers and, therefore, different experiences, and because the market is quite immature. Among the public actors, there was agreement on the main benefits and disadvantages of reconditioned furniture, and general agreement that 1) the reconditioning sector needs to market itself better and 2) the public sector needs to invest in education and improved practices in order to scale up procurement.

As with all new markets, there is a potential problem to match supply and demand: procurers must be assured that reconditioners can supply larger volumes of uniform furniture for larger contracts, whereas reconditioners may not be able to make significant investments unless contracts are secure. One way forward is to always establish framework contracts that include both new and reconditioned furniture so that a public body can choose which type of furniture they want to obtain. Establishing new types of contracts might become a challenge for the contracting authorities, as specialized needs arise and the procuring officers cannot verify quality issues over cost claims. Therefore, additional mechanisms ensuring the procuring side might be required. On the other hand, the reconditioners could provide quality assurances in the form of extended guarantees and other informative channels.

5. The potential for PSS solutions

A major drawback with the current public procurement of reconditioned furniture is that it does not necessarily drive design changes among OEMs. Such positive design changes could, for instance, make furniture more durable, use a modular design that makes upgradability and reparability easier, and so on. The interviewees pointed to examples of OEMs that would rather throw away used furniture than allow it to be reconditioned, as reconditioned furniture would cannibalize their new sales.

The environmental benefits, and potentially also the cost savings for procuring agencies, could be even greater if they lease furniture and focus on the functions they provide, compared to purchasing reconditioned furniture. This could also be a way to provide OEMs with incentives to change furniture design and to keep used furniture in use rather than discard it. If OEMs lease the furniture, then it becomes a source of prolonged revenue, which could then incentivize appropriate changes in design for, higher quality, durability and reconditioning. Function-oriented procurement is a way to stimulate innovation [14], and public procurement can also stimulate PSS-oriented business models [15].

However, in a recent survey of Swedish procurers, about 45% expressed interest in purchasing second-hand products, while only 20% expressed interest in furniture leasing instead of buying (though 30% stated that they “did not know” if they were interested in leasing furniture) [13]. Why this limited interest? Probably, leasing would create uncertainty. Most procurers are used to purchasing products, not the function of products. Examination of the potential procurement of lighting as a service has revealed that a web of technical, institutional and regulatory barriers can impede such solutions and that extensive work in change management is required in order for such procurement to progress [16]. Furthermore, the contractual complexities of developing PSS relations are considerably higher compared to the traditional settings of ownership contracts. Thus, moving towards PSS solutions may be cumbersome, and public authorities might face additional financial and human resources constraints by engaging in more complex procedures of procurement. In the case that public procurement leads to larger volumes of reconditioned furniture purchased, this may trigger OEM interest in providing PSS-oriented solutions.

6. Conclusions

As CE is gradually becoming more prominent in EU and national priorities, public procurement has been championed as one of the most promising policy interventions to improve resource efficiency throughout the economy, by enabling the market formation for innovative, resource-efficient solutions.

Office furniture can be seen as one of the most attractive and interesting product groups from a CE perspective, as it is durable, technologically stable, and there is a high potential for reuse and reconditioning of used furniture.

Through expert interviews within the reconditioning sector and with public procurement officers, we outline the potential of furniture reconditioning. The main conclusions point out that there is indeed a significant potential to support furniture reconditioning and PSS solutions through public procurement.

It is important that procurement criteria are designed in a way that does not exclude reconditioned furniture from public tenders. Thus, equally important is to revise the rules and framework conditions of procurement, especially through the establishment of large framework contracts allowing furniture reconditioners to participate together with the OEMs. Furthermore, the reconditioning sector needs to improve its visibility and marketing activities and to foster closer cooperation with public authorities. On the other hand, public procurers need to be equipped with the appropriate set of skills and competences to allow the identification and handling of such opportunities (i.e., reconditioned offerings). Therefore, training and education of public procurers are considered critical for the future development of procurement criteria and contracting conditions.

Regarding PSS and functional procurement, it is still uncertain how the procuring authorities can handle the associated contract requirements.

Finally, a grand challenge when stimulating CE through GPP concerns the need to balance requirements that open up for new solutions with other important issues. These include good competition in the market, and a need to ensure that the purchase of vital goods and services is not distorted.

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