Rijkswaterstaat
Ministry of Infrastructure and the Environment

REBus Furniture
Sector report

www.rebus.eu.com

Inhoud

The EU LIFE REBus project[1] aims to reduce product consumption by demonstrating the commercial case for European businesses to change their business models. As a REBus partner, the Dutch Rijkswaterstaat has aligned these business models with public procurement budgets, asset management and legislation across a variety of procurement categories including Furniture, textiles, electricals and construction.

This category report focusses on the opportunities and learnings from the REBus pilots relating to furniture.


Office Copper8

1 Developing Resource Efficient Business Models – REBus. LIFE12 ENV/UK/000608 www.rebus.eu.com

1 Furniture production in EU member states

General market

All sections of the furniture production value chain are present in the EU with high quality raw materials and components suppliers. However, the furniture sector as a whole has lost importance within the EU economy in the last decade. Western Europe provides around 80% of total EU furniture production. In the largest markets of Germany, Italy, the UK and France there is a trend for the share of national production to be contracting by around 10%. Among the leading EU furniture markets, Germany, France and the UK depend on imports for around 50% of total consumption (in value) with the UK relying more than the others on extra-EU suppliers.

The Netherlands, Belgium and Austria are highly dependent on imports (accounting for over 70% of the total market in value). The Netherlands, for example, imports largely from Germany and Belgium and also sources a lot of furniture from extra-EU suppliers (the import penetration from extra-EU countries is the highest among the 28 countries considered)2. The Baltic and eastern European countries tend to have a higher concentration index (relative importance in national GDP) for furniture production.

Office furniture accounts for about 9.3% of overall furniture consumption (by value) in the EU, in 2012. It is also a market where import penetration is lower. This is partly due to the fact that large office furniture purchases are quite often made by contractors, developing or co-developing the project with the manufacturer, thus providing a comparative advantage to national companies.

Production & consumption estimates

Reporting of EU furniture production is by unit, so the overall tonnage of furniture produced and consumed within the EU is difficult to estimate.

Around 68 million office furniture units were produced in the EU28 states in 2015 according to Eurostat. This does not equate to consumption due to import and export factors.

The total value of reported furniture produced across the EU was €6.7 billion in 2015 which is an underestimate compared to the €8.8 billion reported by FEMB (European Federation of Office Furniture Associations) in 2014. Differences in scope of data sources and product ranges will account for some of the difference. The top five producers (Germany, France, United Kingdom, Italy and Spain) accounted for around 72% (€4.6 billion) of this value.

Table 1 based on OJEU tendering estimates that for 2015 around €2.45 billion of public procurement tenders were awarded for furniture products and services, with 14% still based on least cost criterion.

Table 1 TED furniture procurement contract awards, 2015

Service	TED Value (€)	percent
Transport	€ 23,018,241	0.9%
Culture	€ 15,796,525	0.6%
Environment	€ 2,624,353	0.1%
Housing	€ 62,153,894	2.5%
Health	€ 175,054,933	7.1%
Education	€ 293,323,560	12.0%
Security & Defence	€ 420,596,663	17.1%
General services	€ 996,480,079	40.6%
Other	€ 463,550,643	18.9%
Total	**€ 2,452,598,889**	

2 The EU Furniture Market Situation and a Possible Furniture Products Initiative. European Commission DG Enterprise and Industry, 2014

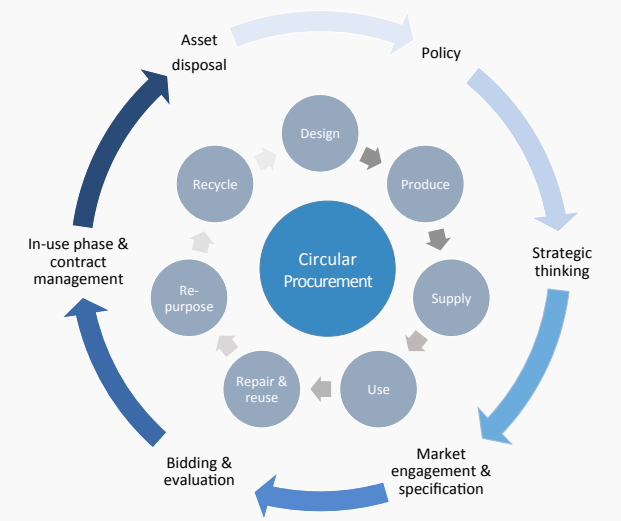
2 Circular procurement and Furniture

Circular procurement provides the opportunity for adapting the business-as-usual (produce-consume-dispose) model to a more resource efficient procurement model that delivers broader policy goals as well as cost savings, reduced environmental impacts and improving social wellbeing. There are many examples and some, such as service-based models are common in many EU member states for certain furniture items. There are broadly three types:

- **take-back** – specifying suppliers and /or manufacturers to take-back furniture at end of use so that they can either be reused, repurposed or recycled more effectively than going into general furniture collection schemes;
- **buy & sell on/back** – these models can create revenue streams by incorporating arrangements for the purchasing body to sell-on furniture at end of use either for reuse or recycling; and,
- **servicisation** - product service system (PSS) models, like leasing, can be relevant to office furniture equipment where in-use impacts and end-of-(first) life pathways can have a big influence of the overall environmental impacts. Product-service systems however are not by definition sustainable. PSS can include incentives for sustainable practices, but this needs to be organised and specified in the right way during procurement. Details on what is needed to ensure sustainability within the services are required to maximise their potential.

When adopting circular thinking, the procurement cycle can be proactively used to influence key areas in product design and manufacture, use and disposal. The inner loop of Figure 1 shows a simplified process cycle applicable to most furniture equipment products. It highlights the key stages for embedding circular thinking and decisions within the product and procurement cycles. Each stage has differing degrees of complexity depending on the furniture item (chair, desk, storage etc.) and materials used (metals, wood, plastics, composites etc.). A key element of circular thinking in procurement is embedding thinking and action by the relevant stakeholders in each stage of the cycle.

Figure 1 Embedding circular thinking within the material and procurement cycles



3 Key themes

Office furniture is typically either wood-based or metal-based in construction. Furniture is made from a large variety of materials often from extended global supply chains. It may therefore be difficult for manufacturers to comply with environmental requirements for all materials used. However, despite this the market for circular furniture products is well developed and it is already possible to buy furniture with high circular impact. Typically the most common materials in office furniture are wood and wood-based panels; metals; plastics; textiles and foam materials. These account for around 55% of all components[3].

The published Dutch circular category plan for furniture identifies 6 key cycles for circular office furniture:

- **maintain** – using preventative maintenance to maximise product lifetime, e.g. a chair remains a chair;
- **repair** – corrective maintenance , e.g. a chair remains a chair;
- **reuse** – redistributing products through a change in ownership, e.g. a chair remains a chair;
- **refurbish** – remanufacturing the product to optimise lifetime, e.g. by resizing a desk or changing the appearance of a chair through re-upholstering to extend 'fashion' service life, or resizing desks;
- **re-purpose** – change functionality of the product, e.g. a desk becomes a table; and,
- **recycle** – recovering the value of components and materials for feedstock as secondary materials in new products.

Various factors make office furniture suitable for circular economy business models:

- The chain can be made transparent - particularly given the level of EU manufacture for office furniture compared with domestic product markets.
- Product designs can be made modular, increasing the potential for lifetime optimisation.
- Material sheets with composition, origin, lifetime help to establish the percentage odreused, recycled material and potential of reuse in following cycles.
- Contributions by developments such as cradle-to-cradle furniture with their pioneering innovation in the furniture category segment.
- Supporting logistics networks - the items are already being maintained and transported can often rely on existing networks.
- The average technical service life (approximately 16 years) broadly fits in with the innovation cycle for furniture taking account of regulatory requirements such as safety, health and market-driven initiatives.

Market readiness is also a challenge that needs to be addressed, e.g. through a demand-led approach from public procurement. The Dutch office furniture market is more or less capable of circular product level (technical) propositions due to its engagement with cradle-to-cradle activity. However, what is currently lacking are the corresponding processes and the routine to facilitate new lifecycles, the business model and the value proposition between the supplier and user. The following sections provide some guidance, based on the specific evidence and lessons from the REBus pilots. These should therefore not be seen as a full and extensive list of the benefits and challenges but as REBus project insights into practical implementation of circular procurement principles.

Rethinking the need

» **Key internal stakeholders:** policymakers, project managers, budget holders, finance teams, central and bi-lateral purchasing bodies and teams, category and in-house asset & facilities managers

» **Key external stakeholders:** manufacturers, suppliers, outsourced facilities managers, rental businesses, financers

3 - Furniture: Background Product Report. EC GPP Criteria, 2008

In terms of rethinking the need, a common barrier is the lack of consideration of existing assets for re-assignment. For example, in the relocation to a new building, an architect and/or interior designer maybe engaged for the interior design of the workspace. Although requirements can be set to make use of the existing contracts within the new space design, practice shows that this does not always happen. The ProRail project addressed this by making consideration of existing assets and early priority within the procurement process. The role of internal financing is also important to consider as REBus pilot projects have found that the purchase of furniture is often recorded as a cost against various budgets. This can make it difficult in project planning and budgeting if the benefits of reuse are perceived to be seen as added costs by a given budget holder or project manager.

Netherlands, ProRail

Circular office furniture

The ProRail pilot for new office furniture and carpet flooring at the new control centre in Utrecht (Netherlands) highlighted the importance of initially developing a vision first to embed circular thinking within the organisation and its procurement processes. This enabled consideration of existing assets – desks and chairs – to be considered alongside procuring new circular products.

In considering needs, ProRail has agreed a 10 year supply and maintenance (including cleaning) contract with the supplier as well as ensuring reuse at end of first life. The contract has highlighted the need to include third party finance arrangements as well as structuring payments to maintain and incentivise whole-term performance across the lifetime of the contract.

Lessons learned report ProRail
Summary lessons learned report ProRail
Factsheet

Lessons

Since it adopts a whole life approach to products, circular procurement requires buy-in and commitment from policy through to operations. From a REBus perspective it makes sense to think of circular business instead of circular purchases. Circularity is most likely to succeed when the entire chain is involved from the moment of defining the need all the way through to realisation and evaluation. So not only the procurers and manufacturers of furniture but users facilities managers, restorers and recyclers, as well.

The Dutch ProRail REBus experience highlighted the importance of developing an internal vision and buy-in to increasing circularity of procurement as well as market consultation and dialogue rounds with suppliers. The fit-out of the new control building also highlighted the opportunity for reuse of existing office equipment when specified as part of the fit-out and design requirements for the new building. The pilot also noted the importance of structuring leasing payments for pay-per-use to ensure appropriate performance from the suppliers.

Adopting a sectoral approach to circular procurement provides a strategic framework for improving circularity of products and services over time. In order to facilitate these sectoral developments further, the Dutch Government has initiated a government-wide category office equipment manager who acts as a ‘supply chain director’ and key contact between public sector bodies as customers and the office equipment supply chain.

Sourcing and design

» **Key internal stakeholders:** policymakers, users, central and bi-lateral purchasing bodies and teams

» **Key external stakeholders:** product designers, interior designers, manufacturers & assemblers, trade bodies. Also potentially academia

The environmental and economic benefits within the six cycles for office furniture are both hindered and potentially maximised through the initial design of the furniture products. Targeting design led outcomes, for example, modular design, design for maintenance, better repair and maintenance options, ease of refurbishment and recycling are all valuable steps in determining what the market can currently and potentially offer. Market engagement, collaboration and suitable procurement criteria will have significant impact based on the evidence from the REBus and Dutch Green Deal pilot projects.

Lessons

A sectoral approach to circular procurement enables the supply chain to better understand future market demand and value and as a consequence to innovate with less risk, e.g. developing new designs, more circular products, and more resource efficient business models (REBMs).

In terms of imported office furniture, validation and verification of green and circular claims in tenders can be problematic when dealing with global supply chains. This highlights the need for strong market engagement and emphasises the benefits of collaboration. Understanding what innovations the market can offer to address circularity in sourcing, product design and verification of claims helps reduce the risks of non-compliance and potentially legal challenge further down the procurement cycle.

Netherlands, InkoopUitvoeringsCentrum (IUC) - Rijkswaterstaat

Circular office furniture

The ProRail pilot for new office furniture and The Dutch Government has set a target for 10% of all procurement to be circular and the study by TurnToo on Circular Offices has identified the high potential to achieve circularity within office equipment.

Responsible for government-wide procurement of office furniture, the IUC has identified two areas for potential savings –

Anticipated reduction of workspaces (ca5,000 per year to 2020) saving approximately € 6-7 million per year across the national government estate.

Extending the life of the current furniture (4 to 8 year extension is feasible) potentially saving € 1.2-4 million per year.

The study estimated that between 5,000 and 11,000 workstations could be immediately re-deployed and a further 5,000 – 12,500 could be repaired or re-manufactured.

As well as the associated environmental benefits this has social impacts in the form of jobs within the remanufacturing and repurposing sectors.

Factsheet & report TurnToo

Purchasing and supply

» **Key internal stakeholders:** budget holders, central and bi-lateral purchasing bodies and purchasing teams, users

» **Key external stakeholders:** distributors, suppliers, service and rental businesses, financers

Circular procurement can help drive vertical integration within the supply chain. The Belgian company PMC Holding is an example of how supply can be driven by demand. Originally starting as an office furniture remover, it began to develop an increasingly wider range of services in response to market demand. This led to facilitating the logistics of large interior design projects. Subsequently, storage and internal logistics have been further expanded at the request of clients along with the formation of NNOF (Nearly New Office Furniture), which responds to the need to repurpose (to give a new purpose or use to) written-off furniture as new office furniture[4].

Where imports are concerned, validation and verification of green and circular claims in tenders can be problematic with global supply chains. This highlights the need for strong market engagement and emphasises the benefits of collaboration.

Lessons

The University Medical Centre (UMC) procurement pilot in Utrecht set an ambition to implement circular procurement principles for the new facility. On this basis, it adopted competitive dialogue to get the needs, capabilities, award criteria etc clarified, not just internally, but also with suppliers. This exercise then determined its award criteria on technical content, financial and process levels.

A key factor for both suppliers and clients is to understand the risk, as Desko (Netherlands) noted in their Green Deal Circular Procurement pilot.

Whilst pay-per-use models might be seen as the purest form, they can also be potentially more risky for less mature and smaller suppliers (without a track record) and for investors. Using circular procurement to encourage collaboration, e.g. through market engagement exercises prior to tendering, can help address this risk. Decorum have also shown that REBMs can create more flexibility. They have adapted their business models to fit size and ambition so customers can buy, rent, lease, lease, pay for use, or purchase and sellback.

The two most commonly used circular economic contract forms at this point are the buy/buy-back model and pay per-use model. An analysis carried out for UMC Utrecht in the Netherlands shows that both models are more economical than a standard linear contract, in which pay-per-use appears to be more economical for a 5-year contract period and a buy/sell-back contract offers the best results for a 10-year contract period.

Budgeting can nevertheless act as a constraint in some cases, especially if the total cost of ownership (TCO) or total cost of usership (TCU) is not costed out initially. This can lead to hidden costs further down the product lifecycle. Even where TCO is costed out, the finance and procurement systems can act as a barrier to realising the benefits, hence the need to link policy and operational processes and delivery more closely. The ProRail and Alliander pilot noted this. Whilst the evidence for greater circularity suggested leasing as a better alternative, the final decision was based on an ownership model with service elements.

4 REBus Pilot Interviews. Rijkswaterstaat (internal communication), 2017

Use and asset management

» **Key internal stakeholders:** asset & facilities managers (internal), users, budget holders

» **Key external stakeholders**: facilities managers (outsourced), suppliers, storage, service & rental businesses, repair, remanufacturers

One of the biggest challenges and potential opportunities is for REBMs for furniture to align the technical, psychological ('fashion') and economic service lives of assets. The role of facilities and asset managers here is important. WRAP has shown that mobile asset planning is an effective tool that can reduce lifetime costs through planned maintenance.

Lessons

The Dutch ProRail furniture procurement pilot also highlighted the potential to reuse existing furniture within new procurements as well as planning for servicing and maintenance as part of the initial procurement. These approaches can lead to increased product usage rates and therefore maximise functional lifetimes and reduce the consequent lifetime product impacts.

Asset disposal and waste management

» **Key internal stakeholders:** asset managers (internal and/or outsourced), users, budget holders, health & safety

» **Key external stakeholders:** collection services, storage services, service and rental businesses, reuse organisations, remanufacturing businesses, recyclers, third sector / civil society organisations, regulators

The bulky nature of furniture brings significant challenges in terms of removal and storage. Lack of on-site storage space can act as a barrier to internal reassignment of furniture items so planning and collaboration are essential to address this across internals departments. Large quantities of packaging are required in the provision of new furniture to protect products. However at end of first life removal often leads to damage if not adequately specified.

Lessons

Take-back models provide one of the most practical circular procurement models to consider with office furniture for maximum impact reduction. However, as with ICT, there is currently limited options for this within the market. Simply taking back the furniture says nothing about the actual re-use. Separate arrangements should be made about to ensure re-use happens as a consequence of take-back. Currently, there are few examples, because the pilots have just installed their furniture and it has not been reversed yet. Circular procurement can encourage the supply of more take-back options and also encourage third party arrangements, e.g. between manufacturers and remanufacturer and/or recycling businesses, e.g. SUSTAIN remanufacturing[5].

5 See REBus website for further details. http://www.rebus.eu.com/resources/case-studies-existing-examples-of-rebms/#furniture accessed March 2017

Netherlands, University Medical Centre Utrecht (UMCU), Utrecht

Furniture procurement and end-of-life

For the new UMC medical facility, the procurement exercise is procuring a ten-year contract for 90% of office furniture, waiting room furniture and living room furnishings, among other equipment. The scope for the contract stipulates that there must be a more circular solution for the existing furniture.
Medical suppliers such as Siemens and Philipps already offer pay-per-use models for some medical services and the UMC have been exploring the potential to extend these to items like furniture. The current market is however limited and needs encouraging. Many of the SME businesses that are flexible in both thinking and product supply solutions are not currently able to support large organisations. Sharing medium and long term procurement needs will help de-risk innovation and encourage more suppliers to participate.

Factsheet, Case study & lessons learned report

Alliander Duiven

4 Replication scale-up potential

The REBus and Green Deal furniture pilots in the Netherlands have demonstrated that circular procurement of furniture is not only possible but that it is practical and delivers on national circular economy goals as well as reducing environmental impacts. Through the more circular procurement of office equipment and redeployment of existing assets, there is an estimated savings €6-7 million per year across the Dutch government estate (see case study box above). If the same potential was available across the EU this would be equivalent to €1.6-2.2 billion per year.

The EU market capacity for a circular furniture category is still currently low even where pilots have shown that it can partly be delivered and potential is high. The take-up of new business models needs to be encouraged and supported systematically through demand-pull in order to motivate suppliers to take responsibility for several lifecycles of a product. This will result in more products that are designed for several cycles and the circular processes that support this.

If the REBus pilot benefits were extrapolated at a national level in the Netherlands this is deliver impact savings[6] of around:

- 41,000 tonnes of CO2 equivalent.
- 13,000 tonnes of material savings.

If these savings were extrapolated across the whole of the EU 28 member states this would create savings of around:

- 984,000 tonnes of CO2 equivalent.
- 315,000 tonnes of material savings.

Scaling up the benefits from the whole REBus project[7], would result in the following annual benefits at the EU level:

- 184 million tonnes direct material savings plus 172 million tonnes material diverted (e.g. reuse);
- 154 million tonnes of GHG emissions savings; and,
- €324 billion net financial benefit (GVA).

The environmental benefit of office furniture was extrapolated on the basis of the number of people employed in occupations which most likely require an office workstation with a desk, chair and cabinet. In Eurostat employment statistics these are: managers, professionals, technicians and clerical support workers. In this way we estimate the consumption of office furniture by the number of workers. This is a very rough estimate. Potential environmental benefit does not only depend on the quantity of office furniture in use, but also on average economic life, and the type of furniture. A more informed estimate requires data over a wider range of projects and countries.

Factsheets Dutch pilots Circular Furniture

- ProRail (Railway infrastructure)
- Alliander (energy network company)
- University Medical Center Utrecht
- Central government of the Netherlands
- Municipality of The Hague
- Municipality of Wageningen
- Municipality of Amersfoort
- Municipality of Venlo
- Rabobank (bank)
- Copper8 (consultancy agency)
- Logge (supplier interior)
- Municipality of Amsterdam

6 Based on assumptions and impacts from Monitoring resource efficient business models: REBUS cases. Rijkswaterstaat Bedrijfsinformatie, 2016

7 Categories covered include construction, textiles, food, ICT and furniture.

Colophon

September 8th 2017, Version 1.0

Created for: Rijkswaterstaat
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Photo credits: Alliander, ProRail, Copper8

REBus

REBus (Resource Efficient Business Models) is a project financed by EU Life+ with the goal of gaining knowledge about the potential of circular business models and investigating whether they can deliver the target of 15% savings in resources and costs. The project is partially being implemented in Great Britain and partially in the Netherlands.
In the Netherlands, REBus is working with other governments and progressive companies to explore models that make circular procurement possible within five industries: IT, office furniture, construction, textiles and catering. By conducting pilot projects, REBus is learning more and more about what is needed for circular procurement.

REBus also applies the knowledge gained in new pilot projects and stimulates participants to share their knowledge. With the intended ripple effect, a project such as REBus will not longer be necessary over time.
More information:
www.rebus.eu.com

ProRail, Christian Richters