Product Group Report: Office furniture

An assessment of the remanufacture of office furniture in the UK.

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1 Overview

The office furniture industry accounts for 8.7% of the larger furniture sector which is considered to be a valuable UK industry worth £10.27 billion in 2004 (Keynote, 2006). Office furniture forms an essential part of a company's fundamental operational requirements and the industry has a broad customer base ranging from micro-sized businesses to multi-national corporations. The market for office furniture is cyclical, with replacement purchases dominating sales, although 70% of replacement purchases occur before the end of the products technical lifetime. Market growth is influenced by a robust economy and a confident business climate. An additional factor is a high level of commercial construction output, of which there has been significant activity over the last five years.

Previously, the industry suffered a considerable decrease in turnover between 2001 and 2004 due to diminished business confidence in the wake of the 2001 terrorist attacks. As office furniture is a durable product, many companies postponed purchasing until the economic situation became stronger. Business confidence slowly returned in 2004, leading to marginal growth in the office furniture sector and in 2005 the sector was valued at £908.3 million at manufacturers selling prices; an increase of 1.3% on 2004 figures (Keynote Report, 2006). With regards to sectoral demand for office furniture, the service industry is by far the fastest growing (around 69% of the entire UK workforce are employed in this area) and therefore is driving the demand for new office furniture products.

The product base is wide and varied, incorporating desks, tables, cupboards, filing cabinets, and seating. Desks and tables dominate sales and hold 45% of the overall market share. Trend analysis predicts that technological changes and changes in the way people work (i.e. hot-desking, home working, etc.) will continue to drive the demand for modular designs. These designs allow for easier reconfiguration for the provision of an adaptable office environment.

Imports and exports are valued at around £243.3 million and £125 million respectively, resulting in net imports of £118.3 million in 2005 (Keynote, 2006). Italy, Germany and Ireland are the UK's major trading partners within the EC and China recently replaced the USA as the largest global supplier to the UK. The influx of cheap products from China has resulted in oversupply and fierce competition which has resulted in UK manufacturers having to drive down their prices more and more. Overall, the value of both imports and exports has steadily risen since 2003.

The UK is second only to Germany as the largest manufacturer of office furniture within the EU. There remains a substantial local manufacturing industry within the UK although some have been adversely affected by fierce market competition leading to closures and acquisitions between 2000 and 2006. Manufacturers generally distribute their products through a network of dealers and wholesalers, with some selling directly to customers. It is unclear how many OEM's reclaim and remanufacture their products although it is estimated that this number is very low.

There is an established market for second hand furniture, mainly of good quality products that are less than five years old. FIRA, the leading industry association, recognises that there is demand for good quality second hand furniture and these products are generally sold through dealers and auctioneers after company rationalisation. The size of the second hand market is valued at around £75 million p.a., pertaining to around 100,000 te of waste.

2 The product

Although, the office furniture market incorporates a wide range of products, they can be described as durable and generally do not lose their functionality over time. The products themselves are manufactured using a variety of materials, and the two most commonly used are wood and steel. Raw materials account for the majority of production costs and this is where significant cost savings can be made by remanufacturing.

The average usage life of office furniture is between 9 and 12 years although the products are capable of lasting much longer, some estimates even go as high as 20-40 years (Besch, 2002). However, products incorporating a number of mechanisms (i.e. chairs) require higher levels of maintenance and may have a shorter life span. These products usually have a higher market value, making them suitable for remanufacturing.

Compared to other products, the environmental impacts of office furniture are spread more evenly along the lifecycle (RMIT, 2001). Materials used in the production of office furniture products include steel, wood, fibreboard, veneers, laminates, plastics, textiles and upholstery fillings. Key areas of concern regarding the environmental impacts of office furniture are the production of solid waste, air emissions and energy consumption during the manufacturing process. Waste arising during production accounts for around 4% of turnover in the British furniture manufacturing industry (Envirowise, 2002) of this around 52% ends up in landfill. During the in use phase there are no issues regarding energy use, but there is a major problem with off gassing of chemicals as this can affect human health.

The overall environmental impacts for office furniture include:

- The use of non-renewable resources.
- High energy use in steel production.
- Chemical use in wood treatment processes.
- Blowing agents (HCFC's) and flame retardants used in plastic production.

- Discharges to air, land and water during furniture manufacturing process.
- The use of pesticides, brominated flame retardants during textile production.
- VOC emissions and water emissions arising from the dyeing process.
- Emissions to air and water from solvents and chromium during the leather lacquering process.
- Emissions and non-renewable fuel use during transportation of goods to retailers and end users.
- Disposal at end of life - waste volumes and transportation of second hand goods to overseas markets. Around 70% of replaced furniture is sold as second hand products either in the EU or in Eastern Europe and Africa. (UEA, 2004)

The industry is led by a number of large manufacturers and, collectively, they have the branding and marketing strength to take forward the agenda for remanufactured furniture. One of these leaders is Wilkhahn, one of Europe's premier furniture manufacturers. The company has a deep rooted commitment to the responsible production and consumption of office furniture. As well as working to company established ecodesign guidelines they also offer after sales service and support, including end of life take back. The reclaimed products are then disassembled; parts sorted into pure material categories and sent for recycling. The company actively encourages refurbishment rather than recycling and this is also carried out by the company, usually at the Bad Münder plant in Germany. No charge is made to the client for the collection of old furniture when new orders are placed with the company, helping to retain customers and encourage participation in the take back programme.

3 Reman potential

One of the key issues for the office furniture sector is increasingly shorter product life cycles. For example, the volume of furniture disposed of each year in the EU has recently been estimated at approximately 2.6 million units, a number which has increased substantially over the last decade.

There is great potential to reduce the environmental impacts of the office furniture industry through product lifetime extension strategies (i.e. re-use, refurbishment, remanufacturing, recycling). Product lifetime extension strategies for used office furniture have been identified as key in closing material loops in the office furniture industry. However, given the high costs of recycling, the remaining options are more economically feasible solutions although a detailed cost-benefit analysis is needed. One barrier to the successful implementation of these product lifetime extension strategies is that the level of awareness of the benefits amongst UK manufacturers is low. The benefits that can be brought to businesses include increased profit, maintained competitiveness and improved environmental performance.

Another barrier to product lifetime extension strategies is that they can diminish opportunities to increase new product sales. One way to overcome this barrier is to provide a whole life service agreement incorporating maintenance, refurbishment and take back services. These supplementary services, as exemplified by Wilkhahn, can provide opportunities to gain competitive advantage, additional revenue and are a channel through which products can be reclaimed at the end of life for use in remanufacturing and refurbishment programmes.

The cost of manufacturing furniture in the UK is rising, affected by higher material prices and the influx of low cost imports. Significant cost savings can be made through the reuse of office furniture and its components, for example it has been estimated that the utilisation of old parts in new office furniture could lead to cost reductions of up to 35% and the cost of remanufacturing office furniture products is estimated at around 30% of new product costs.

Design for disassembly strategies exist but have not been universally adopted. These strategies are important for the remanufacturing process in order to keep labour costs to a minimum. The use of standardised parts across product lines would also allow for reuse in all new or remanufactured products. Furthermore, classic and multi-functional designs reduce product obsolescence, and should be encouraged. These design strategies should provide designers with an opportunity to innovate, rather than be viewed as restricting factors.

Sales of office furniture are linked to trends in fashion and organisational prosperity. As aesthetic appeal is a major factor influencing the decision of many to purchase remanufactured goods, remanufacturers need to keep up to date with design trends. There is also scope to introduce low cost, sustainable techniques that re-laminate or redecorate furniture surfaces so that remanufactured products are sold at a quality that equals that of new products, thereby improving perception of remanufactured goods.

Social enterprises play an important role in diverting used office furniture from landfill and there are around 400 furniture re-use organisations currently working to social and environmental objectives across the UK. This industry employs around 3,000 staff, provides training for 5,000 people, helps around 500,000 low income households, reuses 2 million items and diverts 85,000 tonnes of waste from landfill each year. Therefore, these organisations are key to the further expansion of remanufacturing and recycling activities in the office furniture sector.

Finally, the development of an efficient take back system is needed as this is a key enabler for effective remanufacturing within the sector. A central organisation, collecting used office furniture should be established and work alongside the manufacturers and FIRA to ensure the effective uptake of remanufacturing. In order to obtain the optimal economic remanufacturing results and ensure a steady flow of goods to be remanufactured, products should be taken out of the use phase at certain fixed dates. This could be implemented successfully by incorporating this criterion into a whole life service agreement, mentioned earlier in this section.

4 Value

It is difficult to accurately value the exact amount of remanufacturing that is carried out on office furniture each year in the UK. Currently most of this work is undertaken by third parties, such as social enterprises, where the products are then either resold or donated to charitable organisations. Remanufactured or repurposed office furniture is resold at a fraction of the original price, although this figure depends upon the condition of the furniture.

5 Evolution rate

With the growing requirement for flexible office spaces and the growth of the service industry sector in the UK, it is predicted that there will be increased demand for office furniture products, particularly those incorporating a modular design.

6 Policy options & recommendations

- **Accreditation** – Office furniture manufacturers should be encouraged to offer a full lifetime service including maintenance and end of life take back schemes. The re-use of reclaimed parts in new designs would then be made easier.

- **Awareness** – Work alongside FIRA, the industry organisation possibly with their Furniture Industry Sustainability Programme, which is a government backed project. This could help to encourage remanufacturing by OEM's in the UK.

- **Purchasing** – Public purchasing policies and procurement should include purchasing guidelines for office furniture. Look to stories of best practice, for example Kolding in Sweden.

- **Market development** – Funding of local social enterprises to provide employment and training opportunities to socially excluded communities through reclaiming and/or remanufacturing office furniture.

- **Product design** – Promote design for disassembly strategies to furniture designers and manufacturers. In particular, modular designs are seen as an enabler to remanufacturing as highlighted in the FIRA Sustainability Strategy. This could be achieved through a design awareness campaign.

- **Logistics** – Establish a central waste management organisation to reclaim and sort office furniture for distribution to manufacturers for reuse, this could be undertaken by social enterprises.

- **Logistics** – Develop take-back schemes, voluntary versus enforced, already being undertaken to an extent. Minimise downtime of businesses and promote the benefits of product remanufacturing to companies as part of their environmental commitments.

7 Model

Assumptions

- Office furniture sector is valued at £908.3 million.

- Second hand furniture market is valued at £75 million.

- 9-12 year furniture replacement cycle.

- 69% of UK workforce employed in service industry, a growing industry.

- 4% of British furniture manufacturers' turnover attributed to waste

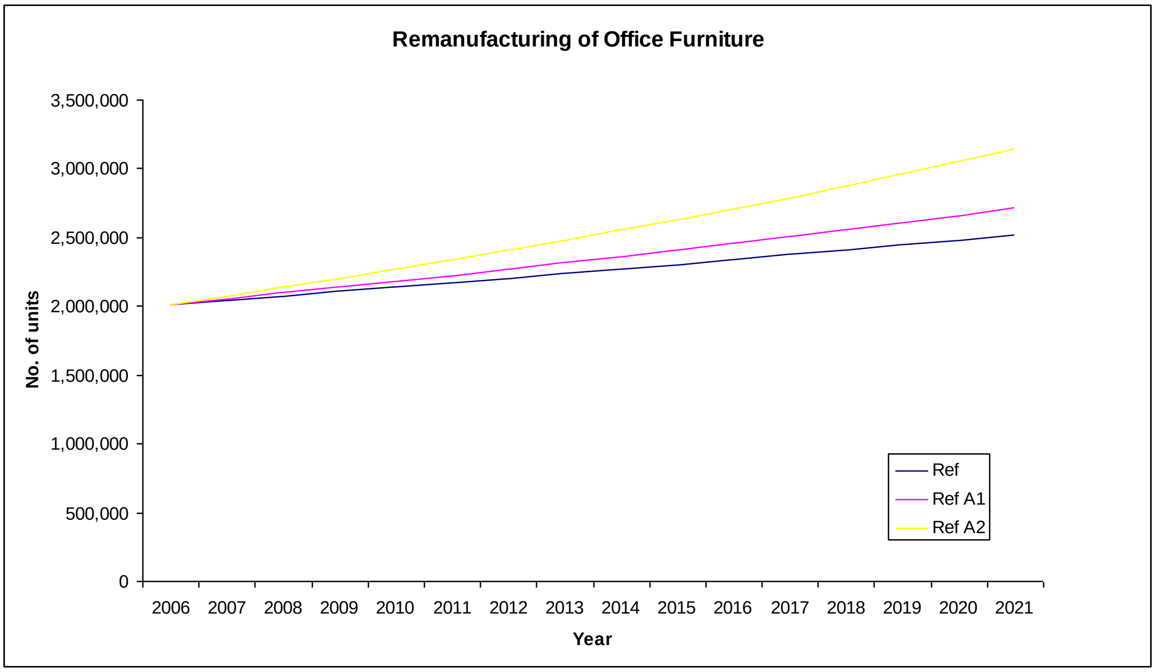
- 52% of this is sent to landfill

- 400 furniture reuse organisations, Greenworks in London is the largest diverting 12,000 tonnes of office furniture from landfill each year.

Table 1: Scenario assumptions

Scenario	Overall output and assumptions	Possible policy Interventions	Units Saved From Waste Stream ('000)	Tonnes diverted From Waste Stream (t)	CO_{2E} Saved (t)	£mil Spent On Reman Products
Ref	Levels of remanufacturing stay the same growing at a minimal rate of 1.5% p.a.	None	34,136	983	1695	1,345
A1	Remanufacturing activities grow slightly by 2% p.a.	National awareness raising campaign aimed at businesses to encourage purchasing of remanufactured products	37,577	1021	1760	1,400
A2	Growth of remanufacturing by 3%, driven by introduction of green purchasing policies for businesses	Introduction of widespread green purchasing policy	40,637	1105	1905	1,512

Figure 1: Scenario impacts on units of office furniture remanufactured



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