

# **The Wood Panel Industry in the UK**

**A report for the  
Wood Panel Industries Federation**

**Europe Economics  
Chancery House  
53-64 Chancery Lane  
London WC2A 1QU  
Tel: (+44) (0) 20 7831 4717  
Fax: (+44) (0) 20 7831 4515  
[www.europe-economics.com](http://www.europe-economics.com)**

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## **1 EXECUTIVE SUMMARY**

- 1 This report is concerned primarily with the economic impacts of the presence of the wood panel manufacturing industry in the UK, and of potential threats to it. It has been commissioned on behalf of the industry by the Wood Panel Industries Federation (WPIF), based in Grantham, Lincolnshire.
- 2 The term “wood panels” covers a wide range of board types, some of which are not manufactured in the UK. For the purposes of this report “wood panels” cover particleboard (also known as chipboard), medium density fibreboard (MDF), and oriented strand board (OSB). Together these are widely employed in construction, commercial and domestic furniture, packaging, shop-fitting and numerous other applications. For most of the purposes they serve they are substitutable only at much higher cost, for instance by solid wood. Demand for wood panels is a derived demand which largely follows the construction cycle.
- 3 Wood panels utilise a range of wood sources, including small roundwood, chips, sawdust, and recovered or recycled wood. Resins and heat are used to bond the wood material into standard-size sheets. In addition to standard boards, value added variants including overlaid boards, machined boards, or boards with enhanced properties, are produced. The manufacturing technology is known world-wide and wood panel manufacture has taken root in most developed nations that have forests.
- 4 In the UK, wood panels are made by four companies – Egger, Kronospan, Norbord and Sonae – all subsidiaries of multi-national corporations domiciled overseas. In the UK the four companies are represented by the WPIF. There has been a wood panel manufacturing industry in the UK since 1898, although current capacity has grown since the 1960s.
- 5 The four UK companies together directly employ just over 2,300 people, mostly in rural areas, although one facility is located in a populous urban area which enables it to take advantage of larger local volumes of reclaimed wood. Upstream sources of supply include forestry, sawmills, waste handling, haulage, resins (and other chemical inputs) and energy. Downstream sectors include haulage, warehousing, and the end-user sectors mentioned above. We estimate that total gross UK employment attributable to wood panel manufacture amounts to just under 8,700 full-time equivalent jobs.
- 6 For several decades the wood panel industry bought supplies of wood in the market, alongside other user industries (for example paper-making), on a competitive basis. The competitive market began to be undermined in 2002 by the government’s introduction of a subsidy to compensate electricity generators for burning “renewable” fuel. Renewable fuel includes wood and wood products, which generators would not otherwise burn because their specific heat content is relatively low. The subsidy is paid by consumers within their electricity bills.

- 7 The regime under which the subsidy operates is termed the “Renewables Obligation”. In return for evidence of burning renewable fuel, generators receive Renewable Obligation Certificates (ROCs) which can be traded. In order to meet their obligations, suppliers must have enough ROCs or make a buy-out payment. Buy-out payments enter a fund which is redistributed to suppliers in proportion to the total number of ROCs that each has presented. The “worth” of an ROC is the sum of the buyout payment that is avoided by presenting the ROC, plus the portion of the buyout fund redistributed to the supplier that presented the ROC.
- 8 The government’s subsidy to generators for burning the kinds of products that the wood panel industry needs is a distortion of the market in wood supplies which clearly puts the wood panel manufacturers at a disadvantage. Wood panel manufacturers estimate that the worth of a ROC is some £54 per megawatt hour, which compares with about £25 for an equivalent volume of wood input that wood panel manufacturers pay.
- 9 Furthermore, the quantities of wood input likely to be required by generators are extremely large. If the UK is to achieve its 2020 greenhouse gas emissions targets in power generation, wood consumption will by then have to rise to about 40 million tonnes per annum. (For comparison, total wood panel industry consumption is steady at between 3 million and 4 million tonnes per annum.)
- 10 However, one cannot look simply at biomass demand in total. Because the majority of new large-scale electricity plants being planned around the UK’s coast will not burn contaminated waste wood or certain other types of recycled wood (while smaller waste-to-energy plants generally will), there will be a disproportionate demand for small roundwood , chips, sawdust and clean reclaimed wood – materials which form essential input to wood panel manufacture.
- 11 Thus far, wood requirements by the generators have run at modest levels because it takes time to adapt or build power stations to burn wood products. All the material we have seen suggests that generators’ requirements will start to rise very sharply from 2012 in all types of wood input – small roundwood, sawmill products and recovered (recycled) wood. Generators will need to import wood on a substantial scale, but the extent to which they will be able to procure under long-term contracts from sustainable overseas sources is not yet clear. Intense pressure on domestic supplies is inevitable.
- 12 The wood panel industry will thus find itself squeezed on price *and* volume, and it rightly fears for its own survival. There is of course exquisite irony in the fact that, as electricity consumers, wood panel manufacturers are obliged to pay a subsidy which generators then use to deny them raw material and thus, over time, put them out of business.
- 13 From the information we have, it is not possible to estimate whether or when the UK wood panel industry might vanish. It would be for the individual companies to decide whether or when to exit; and as all four are subsidiaries of overseas-based multinationals any such decisions might not be taken in the UK, and might not be based on the UK situation alone.

- 14 If the industry vanished today, the loss of employment would be some 8,700 jobs gross and about 4,400 net (taking account of the standard government re-absorption factor, which recognises that, over time, displaced employees find other employment). The effects would fall most heavily on the panel manufacturers themselves, and, to a lesser extent, on the suppliers of specialist resins.
- 15 In principle, employment in forestry, sawmills, and waste processes, and in haulage, would be unaffected, since demands for wood input for power stations would replace demands from current users. However, job losses in the wood panel industry would be concentrated in a small number of rural areas. These are the areas around:
- Chirk and Oswestry, on the Welsh border (Kronospan);
  - Hexham, Northumbria (Egger);
  - Auchinleck, nr. Cumnock, Scotland (Egger);
  - South Molton, nr. Barnstaple, North Devon (Norbord)
  - Cowie, Scotland (Norbord);
  - Inverness, Scotland (Norbord)
- 16 Sonae manufactures in Knowsley on Merseyside: not a rural area, but nevertheless an Assisted Area, where levels of unemployment are relatively high. The Sonae plant is thus unlikely to escape the difficulties that would beset the rural plants.
- 17 The effects in Chirk/Oswestry, Hexham, South Molton and Auchinleck would be especially severe, given the relatively large size of the manufacturing plants and the relatively small size of the local populations. While the standard re-absorption factor used by government is 0.52 (i.e. 52 per cent of displaced employees find alternative employment within three years) it may well be that in sparsely populated areas such as those listed above, it may take much longer than three years to achieve 52 per cent. It is beyond our remit to attempt detailed local assessments of re-absorption.
- 18 It seems likely that if generators' demands for UK-sourced wood products are encouraged to develop unchecked, the sawmilling sector too will fall victim to a structural change in which generators will effectively buy the whole tree, i.e. will integrate vertically into forestry ownership and product preparation. The employment effects will thus not be confined to wood panel manufacturing but will extend to the 12,000 or so employees who are estimated by the Forestry Commission to work in sawmilling and related activities.
- 19 Although we are not asked to deal with environmental impacts, we can at least highlight three facets of wood panel manufacturing that seem to us important in the overall policy context:
- once wood inputs are burned, no further use is possible for the material. Conversely, using wood inputs to produce panels extends the working life of the

material by several years, and at the end of its useful life it is still then available for burning.

- the wood panel industry makes a sizeable contribution to the UK's Renewable Heat Initiative (RHI). From its inception the industry has been using biomass derived from its own process residues to generate process heat, thus contributing to UK CO<sub>2</sub> reduction targets. In 2009 the amount of renewable heat thus generated was 1.6Twh. This contribution stands to be lost or significantly undermined by the RO policy.
- if the power generation sector is allowed or encouraged to become the dominant user of wood inputs, it is likely that the ownership of forests, woodlands and sawmills will become much more concentrated, and that the objectives of the new managements will be different from those that prevail now.

20 The abiding question remains: is it worth, from a policy perspective, sacrificing the wood panel industry for the putative environmental gain from burning in power stations the wood inputs that the industry needs?

21 From an economics point of view, the overarching need is to correct the distortion induced by the payment of so large a subsidy to the generators. Remedies would logically be chosen from among the following :

- no ROC is awarded for any biomass burning; or
- no ROC is awarded for the burning of any biomass material where there are competing uses for it; or
- no ROC is awarded for burning designated biomass (such as those inputs that the wood panel industry needs).

22 We understand from the WPIF that such remedies have already been rejected by government, and we therefore move on to recommendations that are still potentially susceptible to adoption. These are essentially two-fold.

23 The first is to modify the ROC banding in such a way as to favour the burning of imported wood products. This would go some way towards relieving the distortion, induced solely by the subsidy to electricity generators, in the market for domestic supplies.

24 The second is to extend support under the Renewable Heat Initiative (RHI) to cover wood combustion plant installed by wood panel manufacturers before 2009. As the RHI terms stand now, plant already installed would attract no support, while identical equipment installed this year or later would attract full support. We see no justification in principle for the differing treatment.

## 2 BACKGROUND TO THIS REPORT

### The Wood Panel Industries Federation

- 2.1 This study was commissioned by the Wood Panel Industries Federation (WPIF). WPIF (<http://www.wpif.org.uk>) is located in Grantham, Lincolnshire, and exists largely to give voice to its manufacturing members and to provide a clearing house of technical, environmental and regulatory information in support of its members' products and processes.

### Europe Economics

- 2.2 Europe Economics (in this report "we" or "us") is an independent economics consultancy, with substantial experience of economic regulation, competition policy and the application of economics to public policy and business issues. The firm advises a wide range of clients including government departments, regulators, international bodies (such as the European Commission and the European Parliament), leading law firms and major private sector companies and/or (as here) their representative bodies.

### The Europe Economics 2006 Report

- 2.3 In May 2006 we completed for the WPIF a confidential report entitled *The impact of the UK Renewables Obligation régime for electricity generation on the supply of raw material for wood panels*. The use of renewable sources of fuel for power generation is required in order that EU and UK government commitments made to reduce greenhouse gas emissions can be implemented.
- 2.4 Under the Renewables Obligation Régime, initiated in 2002, UK electricity generators receive subsidy for burning biomass fuels, either on their own or mixed with coal in a technique known as co-firing. The subsidy takes the form of a charge levied on electricity consumers which finds its way back to electricity generators via Renewable Obligation Certificates (ROCs) issued by the energy regulator, Ofgem.
- 2.5 Certain types of biomass, particularly sawmill products (such as sawdust and chips), post-consumer recycled wood and small roundwood, have long been used as essential input by wood panel manufacturers. The subsidy paid to generators thus puts generators in contention with wood panel manufacturers (and other processors too) for supplies of wood products. In 2006 the subsidy paid to generators amounted to roughly twice the unsubsidised market price that wood panel manufacturers had previously been paying. The payment of so large a subsidy distorted (and still distorts) what had formerly been a competitive market.
- 2.6 Because of the long timescale involved in building power stations or converting them for biomass burning, little hard evidence was available by the time of our previous report of the scale of purchases of biomass by the generators. This present report is able to draw on the evidence of the period 2006 to 2009.

## **The purpose of this report**

- 2.7 The main aims of this report are to describe the activities, scale and economic contribution of the UK wood panel industry, to show the economic and social costs attendant upon the Renewables Obligation policy, and to suggest options that would limit the damage to the UK wood panel industry.
- 2.8 We first set the scene concerning the wood panel industry in the UK – the make-up of the industry, the manufacturing companies and their upstream and downstream relationships, employment, sources of raw material, and, to the extent relevant, comparisons with other panel-producing Member States of the EU.
- 2.9 We then go on to examine the demand for raw material inputs by competing purchasers – principally the wood panel manufacturers and the electricity generators. We also consider alternative types or sources of material available to each.
- 2.10 Next we assess the national and local economic impacts of the wood panel industry with its direct and indirect connections. We assess these impacts mainly in employment terms.
- 2.11 Finally we contemplate a number of policy options that could underwrite the viability both of the wood panel industry and of the government's commitment to reducing greenhouse gas emissions in power generation.

## **Sources of data used**

- 2.12 In the main we have relied on published sources of information about the wood panel industry. A list of documents and websites that we have consulted appears at Appendix 1.
- 2.13 In addition, we have made direct contact with the four UK member companies of the WPIF, namely (in alphabetical order) Egger, Kronospan, Norbord and Sonae. More detail about each company appears in Section 4 of this report. The aim of our speaking directly to the companies was to obtain data not available in the public domain and thereby to improve the authenticity of this report. Some of the information volunteered by the companies was commercially sensitive so we have aggregated and/or anonymised it, and wherever possible have presented relative rather than absolute figures.

### 3 WOOD PANELS – A BASIC DESCRIPTION

#### Types of panel and the manufacturing processes

- 3.1 The principal types of panel dealt with here are particleboard, medium density fibreboard (MDF) and oriented strand board (OSB).
- 3.2 **Particleboard** is most commonly made from softwood chips, though hardwoods are sometimes used. The chips are dried and mixed with an adhesive appropriate to the end-use. The chips are formed into a mat and pressed between heated platens to compress and cure the panel. The finished panels are then sanded and cut to size. Developments in adhesive and manufacturing technology have resulted in a diversity of panel products aimed at a wide variety of end uses including, furniture components, worktops, door cores, domestic, office and mezzanine flooring. There are value-added variants within the product ranges that either have decorative surfaces or enhanced physical attributes.
- 3.3 **MDF** is made by reducing steamed wood to fibres, then the wet fibres are dried and an adhesive added. This mix is then formed into a mat and pressed. Fibreboard has a wide range of properties and end-uses, some of which overlap with those of particleboard and OSB. End-uses include furniture components, architectural mouldings, display components, laminate flooring, shop-fitting interiors, internal wall linings, staircase components, window boards and DIY. Here too there are value-added variants within the product ranges that have decorative surfaces or enhanced physical attributes
- 3.4 **OSB** is made of wood strands, formed in three layers, with the strands in the surface layer orientated roughly in line with the length of the panel, giving the panel greater mechanical strength in that direction. Common applications of OSB include flooring, wall sheathing, sarking<sup>1</sup>, packaging, furniture. and site hoarding. Again there are value added variants that have protective surfaces or enhanced physical attributes
- 3.5 Though its share of output is gradually declining, particleboard remains easily the largest component of total panel output across the whole of Europe (at about 65 per cent), followed by MDF (about 20 per cent) and OSB (about 5 per cent) – with other miscellaneous forms accounting for the remainder. OSB is the fastest-growing segment.
- 3.6 Within the applications identified above, raw board panels have virtually no technical substitutes. In some applications other materials can be used, but generally at a much higher cost to the user. For instance kitchen worktops can be made of granite or solid wood; carpet is an alternative to a laminated wood floor; and furniture too can be made of solid wood – but prices for all these alternative materials are substantially higher than for wood panel-based products.

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<sup>1</sup> Cladding placed over the rafters of a roof before tiles or slates are fixed in place.

## Process inputs

- 3.7 Direct materials used in panel manufacture comprise principally wood inputs and resin, with energy to provide heat for the formation of the panel itself. The average percentages of each (by cost) in the three main products described are shown in Table 3.1 below.

**Table 3.1: Breakdown of direct material cost 2009 (percentages)**

	Average across all types of raw board
<b>Wood</b>	31
<b>Resin</b>	43
<b>Energy</b>	26
<b>Total</b>	<b>100</b>

*Source: Europe Economics from confidential industry data*

## Technical developments

- 3.8 WPIF has advised that there is general market demand for more lightweight panels. In the furniture sector there is increasing demand for cut-to-size panels and for component manufacture, while the construction industry is moving towards more factory-built systems, with the result that timber frame construction, and thus demand for SIPS panels and engineered components, is increasing. The UK wood panel industry can add value by supplying into these growing applications – but this will happen only if the UK panel manufacturing base itself is not undermined.

## **4 THE WOOD PANEL INDUSTRY IN THE UK**

### **Information sources**

- 4.1 In this section we have relied almost entirely on third party published reports. The timetable allowed for our own report would not have permitted us to carry out *de novo* research, and there would have been little point in our doing so, since the published research that we have been able to draw on is both current and of good quality.
- 4.2 Our principal sources of information (see Appendix 1 for more detail) are:
- WRAP, *Wood Waste Market in the UK, 2007*
  - Indufor, *Study on the End-User Markets of Particleboard, MDF and OSB, 2007*
  - The European Panel Federation (EPF), *Annual Report, 2008-2009*
  - UNECE/FAO *Forest Products Annual Market Review, 2008-2009*
  - John Clegg Consulting Ltd, *Wood Fibre Availability & Demand In Britain 2007-2025*

### **UK demand for wood panels**

- 4.3 Demand for wood panels is, in the jargon of economics, a derived demand, i.e. the demand for it arises from demand for other products which incorporate wood panels.
- 4.4 Wood panels are part of a larger market in wood products, and total UK demand for wood products was assessed by WRAP in 2007 at 12.5 million tonnes per annum. Demand for this 12.5 million tonnes was broken down as follows:
- 42 per cent construction
  - 28 per cent furniture
  - 10 per cent packaging
  - 7 per cent joinery
  - 3 per cent mouldings
  - 7 per cent miscellaneous other
- 4.5 These figures are generalised across total wood based panel consumption, including plywood. The actual end use split between board types varies significantly.
- 4.6 WRAP estimated that in 2007 some 44 percent of wood product demand was met by solid wood, and 20 per cent by imported furniture and imported joinery. Thus about 36 per cent of demand was met by wood panels of one kind or another, not necessarily all UK-made.

4.7 Of total UK demand for UK made panels, WPIF estimates the following breakdown:

- particleboard 64 per cent
- MDF 29 percent; and
- OSB 7 per cent.

4.8 As regards end-usage, WPIF estimates the breakdown shown in Table 4.1

**Table 4.1: End-use demand for UK-made wood panels (per cent)**

	Construction	Furniture	Other
<b>Particleboard</b>	55	40	5
<b>MDF</b>	40	50	10
<b>OSB</b>	80	10	10

Source: WPIF estimate

4.9 All three panel types experienced rising demand between 2006 and 2007, then falling demand through to 2009, as Table 4.2 shows. Demand in 2009 was lower for all three product types than in 2006. OSB details are excluded but trends are indicated.<sup>2</sup>

**Table 4.2: Changes in UK demand for wood panels**

	2006	2007	2008	2009
Particleboard	100	104	100	90
MDF	100	108	92	84
OSB	100	up	down	down

Source: WPIF members' responses to requests for data from Europe Economics

## Domestic supply, imports and exports

4.10 The UK is not self-sufficient in the supply of either particleboard or MDF.

4.11 EPF estimates that in 2008 the UK consumed 2.760 million cubic metres of particleboard but produced only 2.115 million cubic metres – roughly 77 per cent of demand, leaving 23 per cent to be met by imports. In MDF the UK production was 950,000 cubic metres compared with consumption of 1.2 million cubic metres – equivalent to 79 per cent domestic supply and 21 per cent import penetration. OSB demand and consumption are more or less in balance, and in fact there is currently a slight excess of UK production capacity over demand.

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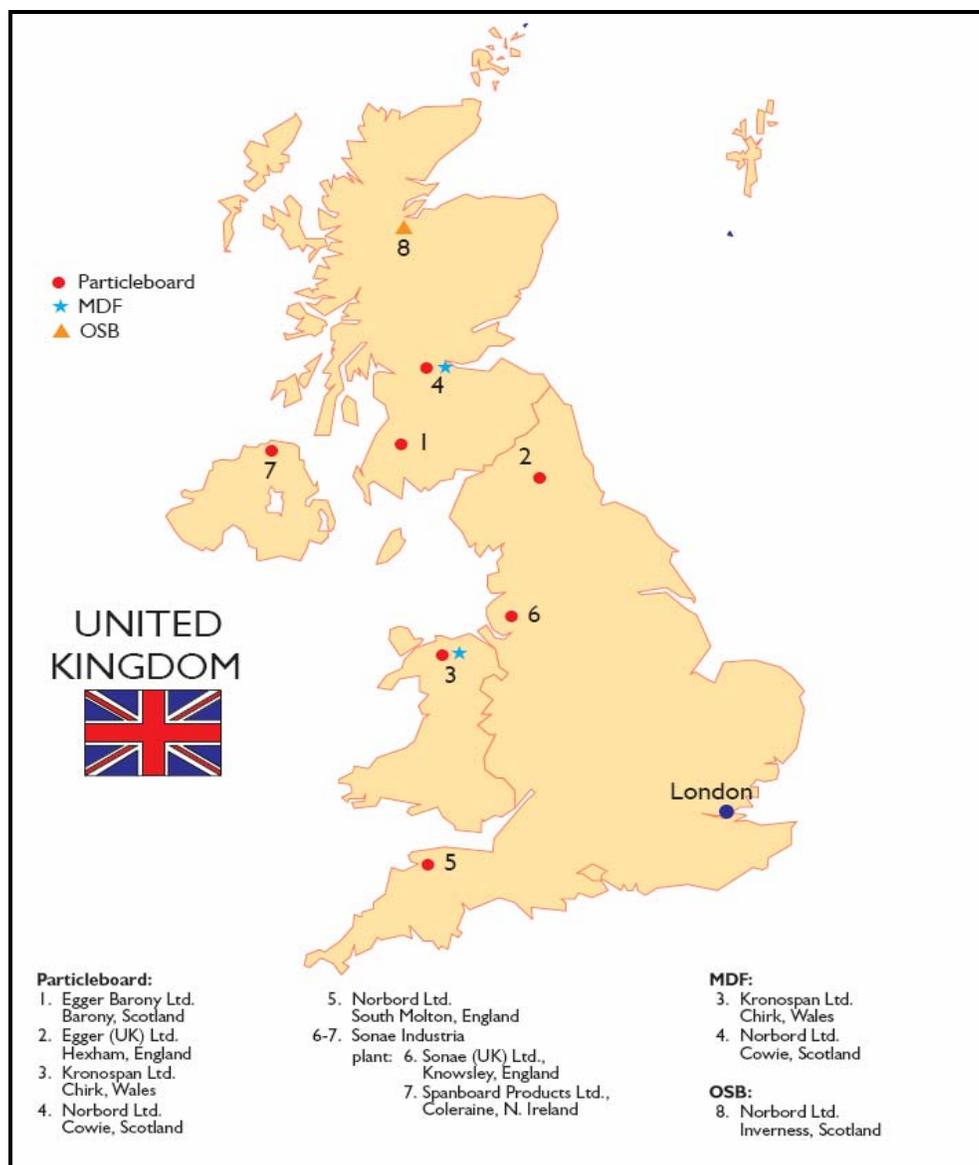
<sup>2</sup> In order not to reveal commercially confidential information relating to Norbord, the only manufacturer of OSB in the UK, we have excised certain statistics for OSB that can be made public for particleboard and MDF.

- 4.12 For particleboard Germany is the UK's largest overseas supplier, supplying 38 per cent of UK imports, while Belgium and France respectively supplied 19 per cent and 15 per cent. Less than 2 per cent of UK-made particleboard is exported, and most of this goes to Ireland.
- 4.13 In MDF Germany and Belgium are again the leading suppliers of imported particleboard. UK exports of MDF amount to about 19 per cent of production, with Ireland and Denmark the leading purchasers.

### **The UK panel manufacturing companies**

- 4.14 The map contained in the 2008-2009 Annual Report of the European Panel Federation (EPF), reproduced as Figure 4.1 below, is a convenient way of showing the number and locations of UK plants.

Figure 4.1: UK wood panel manufacturing companies and their plants



Source: EPF Annual Report 2008-2009. But note that Spanboard ceased the production of board in 2009.

### Member companies

4.15 There are four manufacturing companies based in the UK – in alphabetical order Egger, Kronospan, Norbord and Sonae.

4.16 All four are subsidiaries of parent companies domiciled overseas.

- Egger (UK) Limited is owned by Fritz Egger GmbH & Co. of St. Johann in Tirol, Austria.

- Kronospan Limited is a subsidiary of a privately owned group, originally founded in Austria but now headquartered in Menznau, Switzerland.
- Norbord Limited is a subsidiary of Norbord Inc., a publicly quoted Canadian company headquartered in Toronto.
- Sonae in the UK consists of two companies: Sonae (UK) Limited and Spanboard Products Limited.<sup>3</sup> Both are subsidiaries of Sonae Industria SA, a publicly quoted Portuguese company headquartered in Maia.

4.17 All four parent organisations specialise in wood products, all operate world-wide, and all have a larger or smaller presence in Europe.

4.18 All four UK companies produce particleboard and two of these also produce MDF, but, as we reported earlier, only Norbord produces OSB. None of the four companies acts as an importer of wood panels, whether from its parent group or from third party producers. In other words, wood panel imports, which are estimated at about 20 per cent of UK consumption, are handled by independent importers/distributors.

### **UK employment**

4.19 From the four companies' returns to Companies House we can establish that their combined turnover for 2008 was £589 million (although this figure is approximate because not all the companies have the same year end). Given the volume decrease already reported above between 2008 and 2009, we estimate the companies' combined 2009 turnover was £520 million.

4.20 Current employment, expressed in full-time equivalents (FTE) as at March 2010, is as follows:

– Egger	575
– Kronospan	555
– Norbord	988
– Sonae	225

4.21 Total direct employment by the industry is thus 2,343, spread across seven plants.

4.22 All but one of the plants employ in excess of 100 people, and three plants employ more than 400, so each is an important employer in its locality.

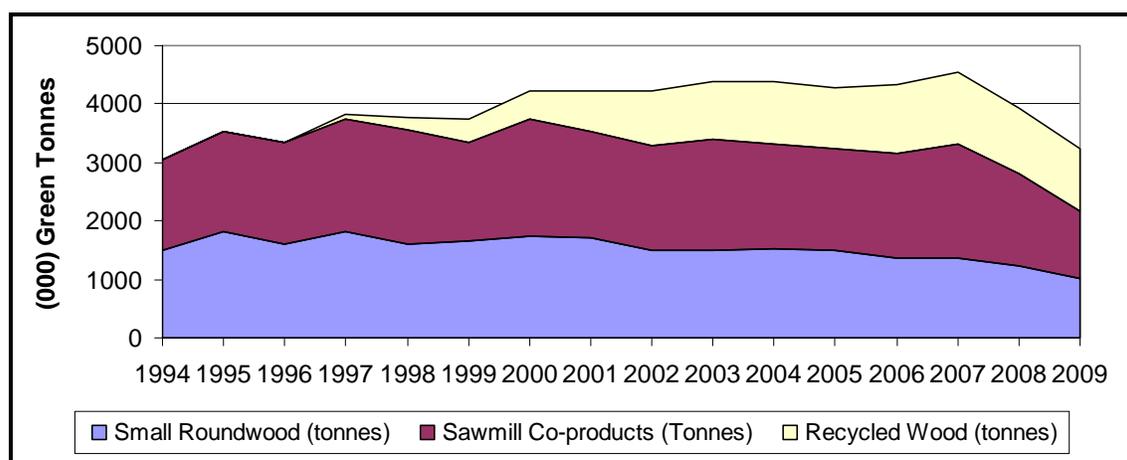
4.23 We now consider in turn the principal inputs to panel manufacturing: wood, resins/adhesives and energy.<sup>4</sup>

## Wood inputs

### Overall wood inputs

4.24 Wood panel manufacture uses wood inputs of three principal types: roundwood, sawmill products and waste wood. The volumes of each used by the UK panel industry over the past fifteen years are shown in Figure 4.2 below, provided and captioned by WPIF.

**Figure 4.2: Wood based Panel Products- Wood Usage**



Source: WPIF from annual company returns

4.25 The peak in overall consumption in 2007 shows up clearly, as does the sharp decline from 2007 to 2009, as the UK and other industrial economies went into recession.

4.26 Also clearly shown is the industry's increasing use of recycled wood, from a standing start in 1997 to consumption approaching one third of the total by 2009.

4.27 These same returns also show that, except in one year (2007), the industry's panel output per unit of wood input has improved steadily over the past ten years, from 0.73 cubic metres of panelling per tonne of wood in 2000 to 0.95 cubic metres in 2009 – an improvement of 30 per cent. Table 4.3 gives the details:

<sup>3</sup> Spanboard Limited, the Sonae subsidiary in Coleraine, Northern Ireland, but still undertakes some value-added activity as well as distribution.

<sup>4</sup> Some panels are supplied with a decorative finish. Although these can add considerable value they are a small proportion of total UK output. For that reason we do not consider finishing materials as principal inputs in this study. The difficulties that the industry faces in the UK are concerned with the manufacture of undecorated ("raw") board, and that is the focus of this report. It would not be economic to import raw board into the UK for decoration, so it is not feasible for the UK industry to retreat solely into board decorating.

**Table 4.3: Panel output per unit of wood input**

Year	Output 000 cu m	Wood used 000 tonnes	Output per unit input
2000	3087	4237	0.73
2001	3139	4217	0.74
2002	3207	4234	0.76
2003	3480	4394	0.79
2004	3596	4392	0.82
2005	3517	4281	0.82
2006	3672	4337	0.85
2007	3599	4539	0.79
2008	3232	3932	0.82
2009	3092	3244	0.95

Source: WPIF from annual company returns

4.28 Not only is recycled wood now an important part of wood input to the panel industry but wood packaging is now a substantial percentage of the recycled wood used: according to WPIF company returns, from 2003 to 2009 it ran at between 53 and 58 per cent.

#### Wood prices

From this point on in our report we need sometimes to refer to WPIF members as Companies 1 to 4 rather than by name, in order to safeguard commercially sensitive information. Company 1 in the first such reference is not necessarily the same company as Company 1 in the second and subsequent references.

4.29 The input prices that the four WPIF companies have paid since 2006 have moved as in Table 4.4 below. These are highly sensitive items of information, and we do not have a uniform presentation from each company.

**Table 4.4: Movements in average wood prices paid by WPIF members**

	2006	2007	2008	2009
<b>Company 1</b>	100	Slightly lower	Rising	Rising
<b>Company 2</b>	100	105	111	113
<b>Company 3</b>	100	105	123	112
<b>Company 4</b>	100	100	100	Rising

Source: Company responses to requests for data from Europe Economics

4.30 In general terms, prices of sawmill products have risen considerably faster than the prices of other wood inputs.

#### Resins/adhesives

4.31 Resins are used to bind wood particles, strands or fibres together to form wood panels. Egger manufactures resins through its subsidiary, Campact, at Hexham; Kronospan makes its own resins on site; and Hexion (see below) makes resins on Norbord's Cowie site in Scotland.

- 4.32 The principal third party suppliers are Dynea, Hexion, and Huntsman, all subsidiaries of overseas-domiciled multi-nationals. Their details are as in Table 4.5.

**Table 4.5: Principal suppliers of resins and adhesives to the UK wood panel industry**

Name	UK locations	UK employment	Parent location
Dynea UK Limited	Mold Newton Aycliffe	77 (average for 2008)	Finland
Hexion Specialty Chemicals UK Limited	South Wales Manchester Stirling	165 (average for 2008)	United States
Huntsman	None (see Note 1)	None	United States

*Note 1: Huntsman has several UK manufacturing locations, but none makes adhesives or resins used by the UK wood panel manufacturers. These products are imported from Belgium.*

*Source: Company websites and returns to Companies House*

- 4.33 The UK wood panel industry as a whole is a substantial customer of the resin suppliers, although, as Table 4.5 shows, the numbers employed are small in absolute terms.
- 4.34 Since resins of the type used by the wood panel industry are oil-based, resin prices follow oil prices. The movements in price experienced by the four WPIF members are as in Table 4.6 below.

**Table 4.6: Movements in average resin prices paid by WPIF members**

	2006	2007	2008	2009
<b>Company 1</b>	100	108	128	160
<b>Company 2</b>	100	104	127	111
<b>Company 3</b>	100	110	149	105
<b>Company 4</b>	100	n/a	n/a	93
<b>Average</b>	<b>100</b>	<b>n/a</b>	<b>n/a</b>	<b>110</b>

*Source: company responses to Europe Economics requests for data*

- 4.35 Price movements in the two main types of resin used – Urea Formaldehyde (UF) and polymeric diphenylmethane diisocyanate (PDMI) – have varied from each other, and the experience of each company has likewise been different as a result of the proportions of resin types that it uses.

### Energy inputs

- 4.36 We have considered energy inputs in two ways:
- first by considering the wood panel industry's performance against its own targets for reductions in energy consumption; and
  - secondly by reporting the recent experiences of the four WPIF members in Great Britain in relation to energy costs.

*Energy performance against target*

- 4.37 WPIF members agreed targets to be achieved in each of several two-year periods, beginning from 1999. The target setting was not entirely straightforward, as each target took account of shifting factors such as industry entry and exit and changing product mix; additionally, the targets themselves were tightened in 2004 and 2008.
- 4.38 The industry's actual specific energy consumption (SEC), measured as primary megawatt hours (MWh<sub>p</sub>) per cubic metre (m<sup>3</sup>) of panel output is as in Table 4.7 below:

**Table 4.7: Industry actual and specific energy consumption**

Period ending	MWh <sub>p</sub> consumed	000 m <sup>3</sup> panel output	SEC (kWh <sub>p</sub> / m <sup>3</sup> )
<b>2002</b>	3,170,074	3,231	981
<b>2004</b>	3,130,272	3,609	867
<b>2006</b>	3,008,661	3,694	815
<b>2008</b>	2,550,761	3,258	783

Source: Climate Change Levy (CCL) report at Milestone 4, 2008

- 4.39 The industry's performance against targets has been as in Table 4.8:

**Table 4.8: Actual and target improvements in energy consumption**

Period ending	Target improvement	Actual improvement
<b>2002</b>	1.3%	-1%
<b>2004</b>	3.5%	11%
<b>2006</b>	7.0%	23%
<b>2008</b>	10%	26%

Source: Climate Change Levy (CCL) report at Milestone 4, 2008

- 4.40 In both absolute and relative terms, the sector's improvement in respect of energy usage has thus improved materially.

*Energy prices paid*

- 4.41 Table 4.9 shows the changes in unit energy prices that the four WPIF companies have paid.

**Table 4.9: Movements in unit energy prices paid by three WPIF members<sup>5</sup>**

	2006	2007	2008	2009
<b>Company 1 Electricity</b>	100	78	153	119
<b>Company 1 Gas</b>	100	55	106	84
<b>Company 2 Electricity</b>	100	103	144	177
<b>Company 2 Gas</b>	100	89	149	141
<b>Company 3 Electricity</b>	100	108	177	141
<b>Company 3 Gas</b>	100	65	107	75
<b>Average Electricity</b>	<b>100</b>	<b>97</b>	<b>150</b>	<b>141</b>
<b>Average Gas</b>	<b>100</b>	<b>70</b>	<b>121</b>	<b>102</b>

Source: company responses to Europe Economics

- 4.42 On average, the companies experienced a sharp energy price rise in electricity between 2007 and 2008, followed by a modest fall between 2008 and 2009. Electricity prices remain a good 40 per cent higher than they were in 2006.
- 4.43 Gas price rises have followed a different pattern: they fell from 2006 to 2007, rose sharply from 2007 to 2008, and then fell back to approximately their 2006 level in 2009.
- 4.44 It is likely that all companies are paying more for their combined energy inputs in 2009 than they were in 2006, though the exact increase will depend on each company's mix of gas and electricity.

### The distribution of raw materials and finished panels

- 4.45 The transport of input supplies to the wood panel manufacturers and of panels shipped out is carried out entirely by road by Norbord and Sonae. Egger uses a combination of coastal shipping (for roundwood inputs) and road; and Kronospan uses a combination of rail (for wood inputs from Scotland) and road.
- 4.46 We estimate from the WPIF companies' responses to our questions that they give rise to 1,000 lorry shipments (i.e. journeys in plus journeys out) per day. The average distance of shipments is estimated to be 110 miles.
- 4.47 Road haulage is handled by a relatively large number of hauliers – we estimate 300 in total (though there may be some overlaps). The average active number of hauliers per company is lower – between 25 and 50.

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<sup>5</sup> One company did not provide annual price movements or the split between electricity and gas.

## 5 WOOD PRODUCTS – SUPPLY AND DEMAND

- 5.1 In this section we use the term “wood products” to refer to material inputs used by wood panel manufacturers, and we focus mainly on the demands for such products by the wood panel industry and by electricity generators.
- 5.2 We begin with an overview of the circumstances which lead generators to buy wood products as fuel in power stations.

### The Renewables Obligation régime

- 5.3 The government is committed to a variety of measures aimed at encouraging electricity generators to reduce their greenhouse gas emissions over years to come. One such measure is the Renewables Obligation Regime, established in 2002, under which electricity consumers pay a levy (as part of their energy bills) to compensate generators for burning certain lower-emission fuels which they would not otherwise burn. Suppliers claim payment against Renewable Obligation Certificates (ROCs), which they earn in proportion to their use of designated fuels and can be traded among suppliers.
- 5.4 From April 2009 onwards the value of the ROC has been “banded” dependent on the technology type. The rate at which generators earn ROCs is shown in Table 5.1, based on Table 12 in WRAP’s publication, which itself used information from BERR (now the Department for Business, Innovation and Skills).

**Table 5.1: Biomass technologies and ROC bands**

ROCs per MWh	Technology
0.5	Co-firing of biomass
1.0	Co-firing of biomass with CHP
1.5	Dedicated biomass
2.0	Dedicated biomass with CHP

*Source: Wood Waste Market in the UK, WRAP*

- 5.5 To explain the terms in Table 5.1:
- “biomass” is a generic (described further below) which includes the kinds of wood products under consideration in this report,
  - “co-firing” means the burning of two fuels simultaneously (in this case usually biomass with coal); and
  - “CHP” stands for Combined Heat and Power, an application of technology which extracts more useful output from a given fuel input than is achievable in non-CHP power stations.
- 5.6 ROCs have a buy-out price. This is the price which suppliers need to pay if they do not have sufficient numbers of Renewables Obligation Certificates (ROCs) to meet their

obligations under the scheme. Such payments are channelled back on a pro-rata basis to those suppliers that have presented ROCs.

- 5.7 The energy regulator Ofgem (the Office of the Gas and Electricity Markets) has responsibility for administering the Renewables Obligation regime and sets the buy-out price per ROC. The buy-out price is adjusted to reflect changes in the Retail Price Index, so it has fallen slightly of late, from £37.19 in 2009-2010 to £36.99 in 2010-2011.
- 5.8 The ROC “worth” (calculated as the buyout payment that is avoided by presenting the ROC, plus the portion of the buyout fund redistributed to the supplier that presented the ROC) has increased to £54 because of an increase in the buy-out price.<sup>6</sup> This compares with an average of £25 per equivalent volume of input that WPIF members pay.
- 5.9 According to Ofgem’s *Renewables Obligation: Annual Report 2008-09*, the total Renewables Obligation across the UK for 2008-09 was fractionally under 29 million MWh, up from 25.5 million MWh in 2007-08 (an increase of 13 per cent).
- 5.10 The percentage of the total UK obligations met by ROCs increased slightly from 64 per cent to 65 per cent.

#### *Biomass fuels for generation*

- 5.11 Biomass fuels include virgin wood and other energy crops grown specifically for use as a fuel; waste and residues from agriculture, forestry and meat processing that can be co-fired; short rotation coppice, from indigenous sources; miscanthus, from indigenous sources; and granulated willow, from indigenous sources
- 5.12 Wastes and residues include:
- Wood (indigenous and imported) including sawdust, chips and pellets
  - Olive residues (imported) including residues, expeller, cake and pellets
  - Palm residues (imported), including kernel, shells, palm kernel expellers (PKE), and PKE pellets
  - Shea residues (imported), including meal and pellets
  - Tall Oil (imported)
  - Sunflower pellets (imported)
  - Cereal pellets (indigenous and imported) principally from wheat and barley straw
  - Tallow (indigenous)

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<sup>6</sup> See: <http://www.ofgem.gov.uk/Sustainability/Environment/RenewablObl/Documents1/Annual%20Report%202008-09.pdf>

5.13 Sewage sludge and waste derived fuels (WDF) can also be used for co-firing.<sup>7</sup>

*Biomass use to date*

5.14 Because it takes time to adapt or build a power station to fire or co-fire biomass, the volumes of biomass that generators have so far burned is small in relation to other uses. Table 5.2 below (derived from Table 10.2 in the Clegg report) suggests the following volumes through to the end of 2007.

**Table 5.2: Waste and residue feedstock for UK co-firing 2005 to 2007 ('000 tonnes)**

<b>Feedstock type</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
Palm residues	447	480	253
Olive residues	283	100	226
Wood & wood residues	286	207	280
Cereal residue/co-prods.	124	152	154
Sewage sludge	21	0	81
All other types	253	104	92
<b>Total</b>	<b>1,414</b>	<b>1,043</b>	<b>1,086</b>

Source: Wood Fibre Availability and Demand in Britain, 2007 - 2025

5.15 By 2007 wood had become not only the largest single product but also the largest *indigenous* product, since the other major contributors, namely palm and olive residues, are imported. Wood and wood residues also happen to be the principal raw material inputs to the wood panel industry.

5.16 We now turn to the generators' future demands for biomass, and especially for the wood products used by panel manufacturers. These look very different from the modest historical volumes shown in Table 5.2.

*Future biomass use*

5.17 The Clegg report pulls no punches in emphasising the sheer volume of wood input that would be required if the plans of generators come to fruition. Clegg's conclusions include the following extracts, all taken from paragraph 11.7:

“...the potential demand for SRW [small roundwood] appears likely to significantly exceed potential availability if all the planned wood energy developments take place.

“...demand for coniferous sawmill products has been, and is expected to continue to exceed their availability if all the planned projects proceed.

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<sup>7</sup> Evaluating the sustainability of co-firing in the UK (Report for DTI), 2006

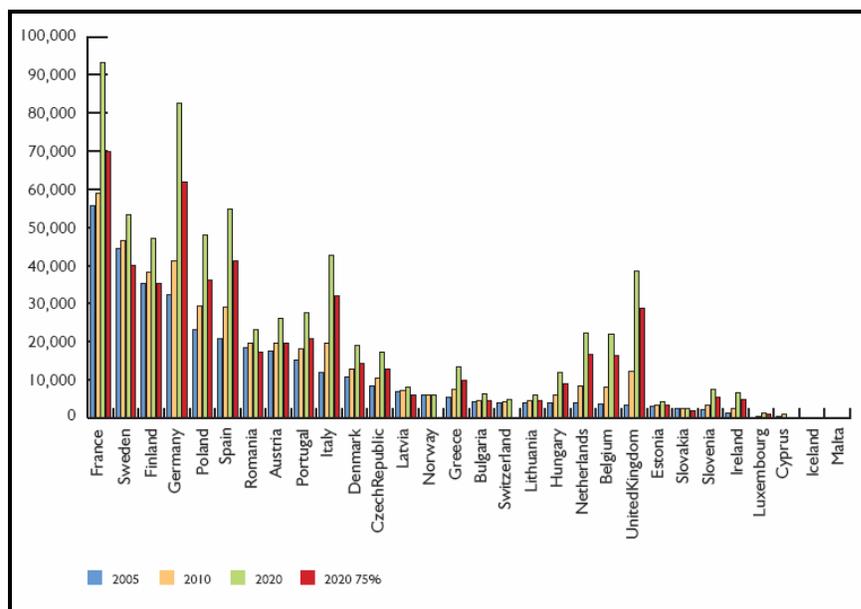
“...demand for recovered wood has been increasing sharply. This trend will continue if all the new wood energy plants being planned become operational, and by 2013 potential demand will exceed potential availability, even assuming that none is used for co-firing.

“Britain could start importing wood chips and pellets for new energy plants in 2012 and the quantity could rapidly rise to about 27 million tonnes per annum if all the planned wood energy plants are built. If this quantity could be secured in the form of long term supply contracts, it would imply an almost doubling of the present world trade in wood chips and pellets.

“The forecast tightness of the markets for different types of wood fibre in Britain, if a significant number of new wood energy plants proceed, imply that supply chains are going to be subject to significant pressure, prices are likely to rise and this in turn will have important consequences for the existing and potential new users of wood fibre and the future shape of the wood processing and wood energy industries in Britain.”

5.18 EPF has estimated in its 2007-2008 Annual Report how much wood each EU Member State will require to burn in 2005, 2010 and 2020 in order to meet national government policy commitments. EPF’s estimates are reproduced in Figure 5.1 below:

**Figure 5.1: Wood required for energy consumption to meet national targets (000 tonnes)**



Source: EPF Report 2007-2008<sup>8</sup>

5.19 EPF’s chart indicates that UK wood requirements will increase from about 15 million tonnes in 2010 to 40 million tonnes by 2020. For comparison, total wood panel industry consumption is currently running at between 3 million and 3.5 million tonnes.

<sup>8</sup> Assuming the relative share of wood energy to other renewables remains as in 2005. In the “75% scenario” the relative share of wood energy to other renewables decreases to 75% of the level in 2005

5.20 A further guide to future demand resides in the published plans of the generators to increase their electricity output from biomass, and we now turn to these.

*Dedicated biomass firing*

5.21 For dedicated biomass, *The Wood Waste Market in the UK* summarises generators' expected demands in a table which we reproduce as Table 5.3 below.

**Table 5.3: Dedicated biomass electricity generation capacity (MW) as at November 2008**

<b>Feedstock</b>	<b>Current Capacity</b>	<b>Under Construction</b>	<b>Awaiting construction</b>	<b>Awaiting planning consent</b>
Virgin wood only	5	4	357	410
Wood waste plus	112	14	100	70
Other biomass only	119	0	43	106
Unknown	82	0	5	0
<b>Total</b>	<b>318</b>	<b>19</b>	<b>505</b>	<b>586</b>

Source: *Wood Waste Market in the UK*, WRAP

5.22 If all the projects go ahead, output from dedicated biomass plants will rise by a factor of five, from just over 300 MWh in 2008 to just over 1600 MWh over roughly the next five years.

5.23 The Clegg report goes on to emphasise that, although a very large part of wood supply is expected to be met from imports, the generators will want to source a substantial amount in the UK :

“Although most of the companies planning to develop much larger wood energy plants expect to import most of their fibre needs on long term contracts, they still expect, or would like, to use up to about 10% of UK sourced wood fibre if possible for various understandable reasons. Assuming this wood fibre sourced from Britain only accounted for about 10% of each of the very large planned energy plants' wood fibre needs, this could still account for up to 3 million tonnes per annum which is a large quantity of wood fibre relative to the quantity of UK sourced wood fibre that is available.”<sup>9</sup>

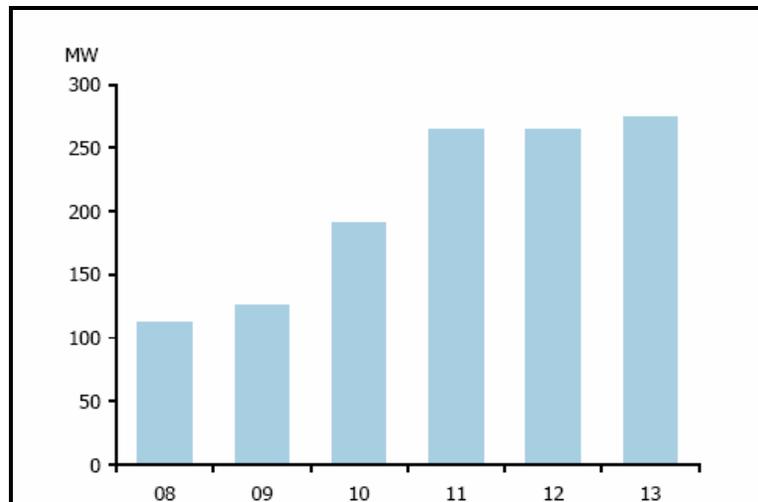
*Co-firing*

5.24 As regards co-firing, WRAP (using material from Oxford Economics) has estimated the increase in output from power stations co-firing wood waste. Figure 5.2 shows the estimates.

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<sup>9</sup> *Wood Fibre Availability and Demand in Britain, 2007 – 2025*, page 15, point 2.15.

**Figure 5.2: Capacity of electricity generating plants using wood waste**



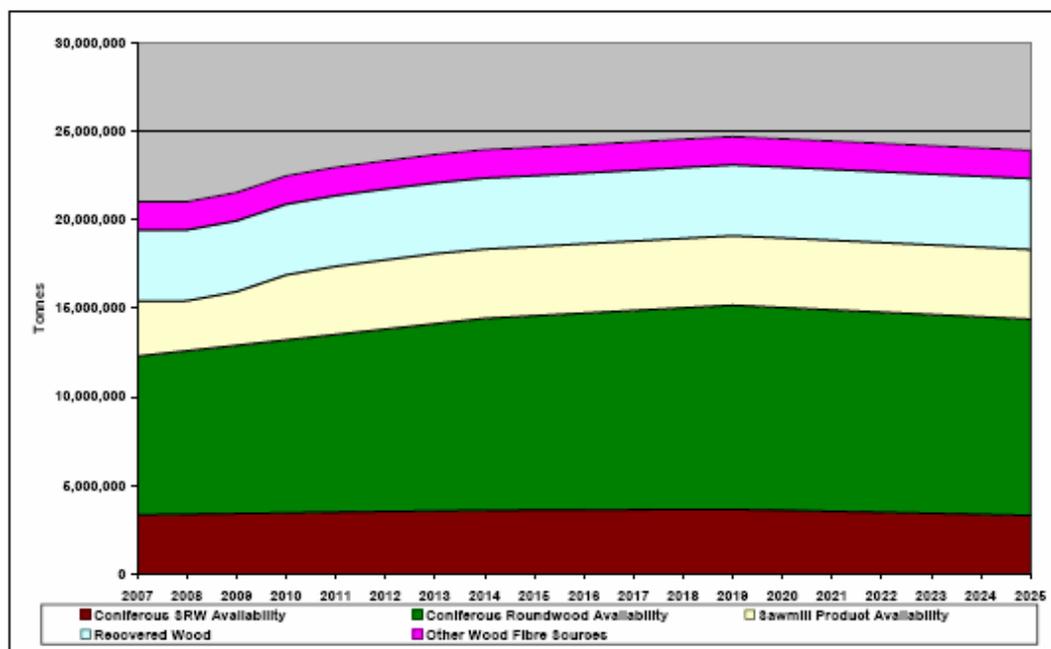
Source: *Wood Waste Market in the UK, WRAP*

- 5.25 Capacity is expected to rise from just over 100 MWh in 2008 to about 275 MWh by 2013. Again, therefore, one can expect that electricity generators will make substantial inroads into supply markets that the wood panel industry has traditionally drawn on.
- 5.26 We now turn to evidence about the UK's capacity to satisfy demand for wood products as defined.

### **Domestic supply and demand**

- 5.27 The Clegg report already referred to (*Wood Fibre Availability and Demand in Britain 2007 to 2025*) paints the following general picture in relation to supply.

**Figure 5.3: Forecast Potential Availability of British Sourced Wood Fibre 2007-2025**

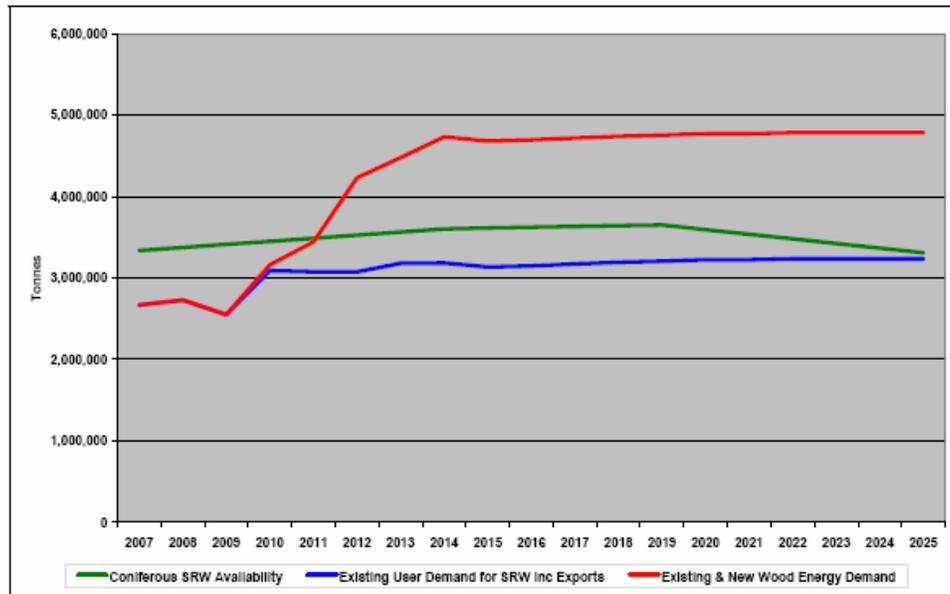


Source: Wood Fibre Availability and Demand in Britain, 2007 - 2025

- 5.28 Visual inspection of Figure 5.3 shows that availability of the materials used by the wood panel industry – small coniferous roundwood, sawmill products and recovered (recycled) wood – all remain more or less static throughout the period. There is a slight increase foreseen in sawmill product availability up to 2011, but thereafter it remains flat.<sup>10</sup>
- 5.29 The report makes clear that estimates of potential availability in Figure 5.3 are theoretical (i.e. biological) possibilities only, and that they take no account of cost, technical or planning constraints, or of the objectives of private woodland owners. Actual commercial production may therefore be significantly less than the maximum biological availability of small roundwood and sawmill shown.
- 5.30 Clegg then looks more closely at small roundwood (SRW) supply and demand. We reproduce Clegg’s Chart 3.5 as Figure 5.4 below.

<sup>10</sup> Note that sawmill products are derived from roundwood during the conversion to sawn timber. Clegg’s chart does not make this entirely clear.

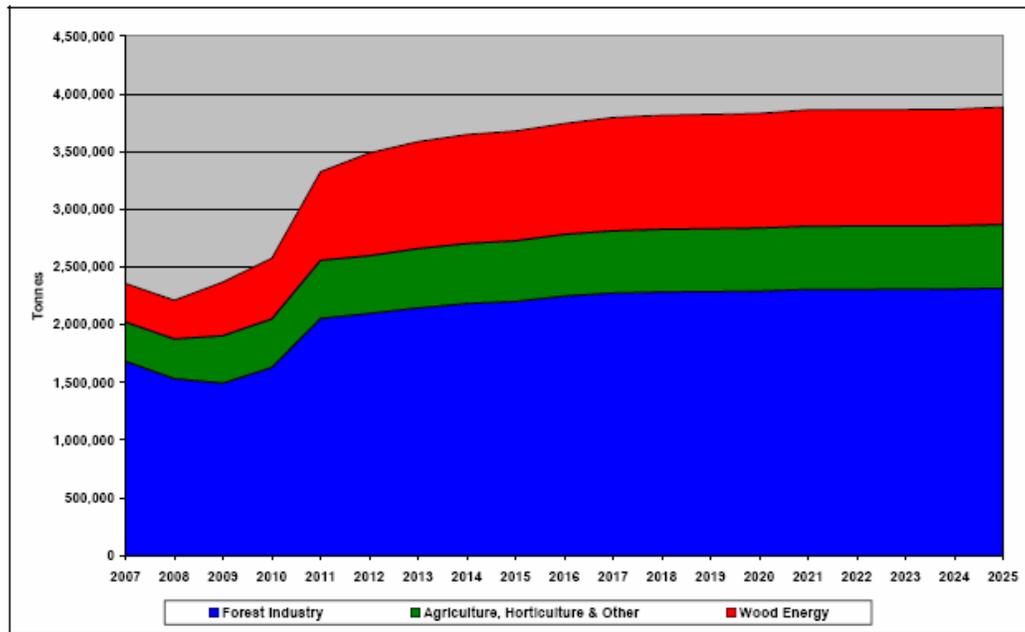
**Figure 5.4: Potential Availability & Demand for Coniferous SRW in Britain to 2025**



Source: Wood Fibre Availability and Demand in Britain, 2007 - 2025

- 5.31 As can be seen, current user demand is slightly below availability, but at about the end of 2011, as demand for small roundwood for power generation rises, the combined demand of existing and new users substantially exceeds availability, even with a slight rise (and it is only slight) on the supply side.
- 5.32 A broadly similar picture of rising demand emerges in relation to sawmill products. Figure 5.5 below (Chart 4.1 of the Clegg report) indicates that the use of sawmill products for power generation increase sharply after 2011.

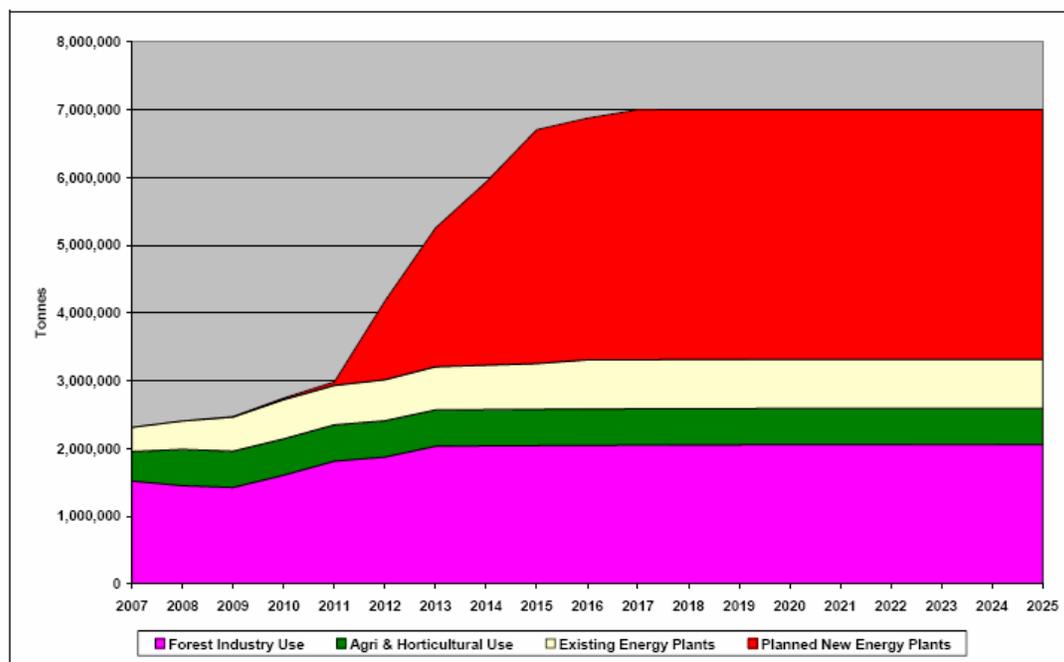
**Figure 5.5: Present and expected use of sawmill products to 2025**



Source: *Wood Fibre Availability and Demand in Britain, 2007 - 2025*

- 5.33 Finally, and consistently with rising demand for SRW and sawmill products, there is a significant increase in the demand for recovered wood after 2011 from planned new energy plants.
- 5.34 Figure 5.2 on page 25 reproduced Oxford Economics' estimates of increasing generating capacity that would use wood wastes.
- 5.35 Albeit on a different basis of presentation, and looking further ahead, the Clegg report forecasts a similar situation, which we show in Figure 5.6. Note that Clegg excludes co-firing from the forecast.

**Figure 5.6: Estimated end-usage of recovered wood to 2025 excluding co-firing**



Source: Wood Fibre Availability and Demand in Britain, 2007 - 2025

- 5.36 In summary, the indications are that demand for wood products from electricity generators will increase rapidly from about the end of next year, resulting in a very substantial excess of demand over domestic supply. Inevitably, this will have an effect on the availability and price of essential inputs to the wood panel manufacturing industry.
- 5.37 It also raises the question of how generators will secure supplies on the large scale that they require. Clegg has some interesting comments to make on this point.
- 5.38 He forecasts generators' needs for imported wood chips and pellets as rising from virtually nil in 2012 to 27 million tonnes per annum by 2017. However, he goes on to say:

“If the imported wood fibre needs to be sourced from woods that are registered as being sustainably managed under one of the certification schemes then this is likely to reduce the potentially available supplies quite significantly.

“One practical issue that will have to be addressed if a virgin biomass import trade starts is bio-security. This might restrict the ability of companies to source virgin biomass from certain regions of the world.”<sup>11</sup>

<sup>11</sup> Wood Fibre Availability and Demand in Britain, 2007 - 2025, page43, points 10.9 and 10.10.

- 5.39 We are in no position to comment on Clegg's caveats. But if he is right, then (a) some of the planned wood-based generating capacity may be in jeopardy and (b) there will be additional pressure on domestic supply – a situation which can only make inputs scarcer for the wood panel manufacturers.
- 5.40 In fact, following discussions with WPIF, we estimate that it is likely to be tighter than the Clegg report suggests. We say this for two reasons: firstly the presence of smaller-scale wood-burning generating plants which Clegg does not deal with, and secondly the potential loss of the RHI contribution already referred to. Clegg assumes (reasonably) that 10 per cent of demand from large scale electricity generation will be met from domestic supply, and he then equates this to 3 million tonnes. But if one factors in RHI and wood use by smaller generators, this could realistically be 3.5 to 4 million tonnes. This higher demand cannot be satisfied from domestic sources without displacement of other demands.
- 5.41 Clegg notes (at paragraph 10.8) that:
- “No assessment of the feasibility of securing these imported supplies at an appropriate price is made in this study as the impact on wood fibre sourced in Britain should be very small, at least in the short term, provided all the supplies are sourced overseas.....”
- 5.42 This is not the case. The experiences of the four WPIF members, as reported to us, are that they are already feeling the squeeze and expect it to get worse.

### **The Government perspective**

- 5.43 On 25 November 2009 Mr. Alastair Kerr, the Director General of the WPIF, had written to the Secretary of State, Ed Miliband MP, asking for a moratorium on granting planning consents for new large-scale biomass power stations. In reply (a letter dated 26 February 2010), the Minister of State, Lord Hunt, assured Mr. Kerr that “our intention is not to affect industries such as the wood panel industry through the RO, but rather to help foster additional, new jobs and wealth-creation opportunities in the UK”.
- 5.44 Lord Hunt does not directly address the question of whether the wood panel industry is being harmed. He goes on to say that
- “...the planning applications so far received for the new large-scale electricity plants indicate their intention to import 90+% of their woodfuel. It is likely that in the short term this will be 100% and until such time as indigenous supply chains for waste wood, virgin material and energy crops are sufficient to meet their needs.”
- 5.45 The evidence we have received from wood panel manufacturers themselves is rather the opposite: that generators will absorb as much as they can of domestic supply, regardless of the effect on wood panel manufacturing, and that they can afford to outbid the wood panel sector on the back of the subsidy they receive.

- 5.46 Lord Hunt points out that the government had recently reduced the ROC award (from 1.0 to 0.5 per MWh) for non-energy crop co-firing, but he does not go so far as to say that this should restore some sort of competitive balance in the market for inputs which the wood panel makers and the electricity generators both want. Even at 0.5 ROC per MWh, the effective subsidy that generators enjoy is still slightly higher than the price that wood panel manufacturers pay. In any event, future purpose-built wood-fired generating plant will receive 1 ROC per MWh, which is equivalent to more than twice the price paid by wood panel manufacturers.
- 5.47 Whatever its magnitude, it is, from an economics perspective, the subsidy that represents the real iniquity and it is, ineluctably, the subsidy which any attempt at restoring a competitive market will have to tackle.

## **6 THE ECONOMIC IMPACT OF THE WOOD PANEL INDUSTRY**

- 6.1 We use the official Input-Output Tables (“the I-O Tables”) to assess the overall revenue and/or employment impacts of the wood panel industry on the national economy as a whole. The principal drawback to using the I-O Tables is that the estimated impacts are averages across each sector: it is necessary, therefore, to assume that the wood panel industry has the same cost structure as that of its parent I-O industry, manufacturing.<sup>12</sup> That said, government itself frequently uses the I-O Tables as a basis for policy-making, and to that extent it is likely to regard impacts based upon them as sound.
- 6.2 The way in which the I-O Tables are used (in the present context) is that one starts from the annual sales revenue of the wood panel manufacturing sector. The I-O tables then indicate the industry’s impact on the industries that supply it, and on the industries that supply them, and so on, adding them up to give a national effect. Revenue effects are converted to employment effects using industries’ revenue/employment ratios.
- 6.3 It is usual to adjust gross employment effects thus calculated by a “re-absorption” factor. This factor recognises that when (for example) a plant closes and people lose their jobs, a proportion of them sooner or later find other jobs, so that the net loss of employment is generally less than the gross loss. The same principle works the other way round: when a plant opens, the gross number of new jobs that it creates is reduced because some employees are sucked in out of other jobs, which may or may not be replaced.
- 6.4 Again, empirical studies over many years have been used to determine what a normal re-absorption factor is. The standard factor that government now recognises is 0.52 over three years, i.e. that over three years only 52 per cent – roughly half – of gross jobs created or lost will be net jobs.<sup>13</sup>
- 6.5 Once the re-absorption effect has been taken into account, it is normal to add on “induced” or “multiplier” effects. These result from the additional expenditures by those whose incomes have increased. They may be thought of as ripple effects in businesses not directly or even indirectly connected with wood panel manufacturing – expenditure in supermarkets, cinemas, pubs, sandwich bars, dog-grooming parlours, video rental shops and so on, as people with income spend it. These effects are (again according to government norms) approximately 10 per cent of calculated net employment effects.<sup>14</sup>
- 6.6 For this study we have used current annual revenue of £520 million in the wood panel industry itself – a figure we have calculated from Companies House returns by WPIF

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<sup>12</sup> We gave consideration to using “wood and wood products” as the parent category, but concluded that the nature of wood panel manufacture is such that it more correctly belongs to the manufacturing sector.

<sup>13</sup> Department for Education and Employment, 1996, Research Study 23, “*The Impact of Redundancies on Local Labour Markets and the Post Redundancy Experience*”.

<sup>14</sup> English Partnerships *Additionality Guide* (<http://www.englishpartnerships.co.uk/communitiespublications.htm>)

members, less an adjustment discussed with WPIF itself. The total turnover of the four companies amounts to almost exactly £590 million for 2008 and we deducted £70 million from that to give an estimated total turnover for 2009.

6.7 Appendix 2 to this report sets out the detail calculations that arise, and Table 4.10 below summarises them.

**Table 6.1: The employment impacts of the UK wood panel industry**

<b>Direct Employment</b>		
1	Output (£m)	520
2	Direct employment at WPIF members	2,343
3	Direct employment after reabsorption (2343 less 52%)	<b>1,125</b>
<b>Indirect Employment</b>		
4	Total gross employment effect from I-O tables	8,090
5	Less employment by WPIF members	2,343
6	Indirect employment	5,747
7	Indirect employment after reabsorption (5747 less 52%)	<b>2,758</b>
<b>Induced Employment</b>		
8	National Income Multiplier (10%)	1.1
9	Induced Employment (10% of 5747 above)	<b>575</b>
10	<u>Grand Total</u>	<u>8,664</u>
11	<b>Grand Total (after re-absorption)</b>	<b>4,458</b>

Source: Europe Economics calculations from I-O Tables

6.8 Table 6.1 indicates that for wood panel industry revenue of £520 million (row 1), the gross employment effect is equivalent to 8,664 jobs (row 10). This is made up of gross direct and indirect employment, namely 8,090 (row 4) plus induced employment of 575 (row 9).

6.9 The figure of 8,090 includes the 2,343 employees reported by WPIF members (row 2), so that figure and the resulting indirect employment (row 6) then need to be adjusted down for re-absorption. Doing this reduces direct employment to 1,125 (row 3) and indirect employment to 2,758 (row 7).

6.10 The induced employment effect is calculated as a percentage (in this case ten per cent) of the gross indirect employment – in other words ten per cent of 5,747 (row 6), giving 575 jobs (row 9).

6.11 Adding 1,125 direct jobs plus 2,758 indirect jobs plus 575 induced jobs gives a total employment effect of 4,458 jobs (row 11).

6.12 At least two thirds of the direct employment is located in predominantly rural areas. An undefined number of additional jobs in forestry and sawmills are likewise located in predominantly rural areas.

6.13 We now consider the effects of a hypothetical closure of the UK wood panel industry

### **Industry closure effects**

- 6.14 We must first emphasise that “the industry” is in fact four independent member companies operating seven sites. All four companies are owned by large overseas multinationals, each of which supplies wood panels from and to other countries. It is at least conceivable, and in our view likely, that:
- decisions about the UK industry would be taken site by site;
  - the decisions would be taken outside the UK;
  - some plant amalgamation might be feasible;
  - as each successive plant closed, or as each successive company retrenched, the remainder might experience improved viability.
- 6.15 Without access to sensitive financial data about each company and site, it would be impossible for us to assess the point at which any site would be ripe for closure and how the consequences would be dealt with. The only reasonable approach we can suggest to assessing whole-industry viability would be a cost of capital assessment. Cost of capital is a term of economics which defines what rate of return a firm must earn in order to remunerate shareholders and lenders. Cost of capital thus includes a profit margin as well as taking into account operating, capital and financing costs, and. Assessing cost of capital requires an assessment of risk, since shareholders and lenders take risk into account before investing or lending.
- 6.16 To carry out such an exercise, it would be necessary to assess what the required costs of capital would be in the UK for wood panel manufacturers as a whole – not an easy thing to do in the case of unquoted subsidiaries of overseas holding companies, but, subject to certain estimates and approximations, not impossible either. If the actual returns being earned were prospectively and consistently below the industry’s cost of capital, we would take that as a sign that the industry as a whole was unlikely to survive. But such an assessment would still say little or nothing about how the retrenchment would be done.
- 6.17 The gross employment generated by wood panel manufacture in the UK is approximately 8,700 FTE jobs, and the net employment just under 4,500. Closure of the whole industry would result in those levels of gross and net job losses.
- 6.18 The difference between gross and net, as we explained earlier, arises from the application of the government’s standard re-absorption factor of 0.52 – which assumes that on average 52 per cent of displaced employees find alternative employment within three years. However, this is a national average, and there may be significant local variations. We think that such variations might apply in this industry since some of the wood panel manufacturing plants are relatively large employers in relatively sparsely populated rural areas.
- 6.19 Specifically:

- Egger employs 500 people at a plant outside Hexham, Northumbria. Hexham has 11,000 inhabitants.
- Norbord employs nearly 600 people at South Molton, North Devon. The nearest town, about 20 miles away, is Barnstaple, population 25,000.
- Kronospan employs between 500 and 600 people close to Chirk and Oswestry, on the Welsh border. These two towns have a combined population of 39,000.
- Norbord employs 300 people at Cowie, near Stirling, Scotland. Stirling has a population of about 80,000.
- Sonae employs over 200 people in the Knowsley area on Merseyside. Knowsley has a population of 150,000, but the highest local unemployment rate of any of the areas where wood panel manufacturing takes place.

6.20 The Parliamentary constituencies involved are as in Table 6.2 below.

**Table 6.2: wood panel industry employment locations**

Company	Location	Parliamentary constituency (party)	Local unemployment rate (GB = 6.9%)
<b>Egger</b>	Hexham	Hexham (C)	8.8 (Note 1)
	Auchinleck, Strathclyde	Kilmarnock & Loudoun (L)	7.4
<b>Kronospan</b>	Chirk, Clwyd	Clwyd South (L)	7.3
<b>Norbord</b>	Cowie, Stirlingshire	Stirling (L)	4.8
	Morayhill, Invernesshire	Inverness, Nairn, Badenoch & Strathspey (LD)	5.9 (Note 2)
	South Molton, Devon	North Devon (LD)	5.4 (Note 3)
<b>Sonae</b>	Knowsley, Merseyside	Knowsley North & Sefton East (L)	7.6

*Note 1: Hexham is too small for a local unemployment rate to appear, so we have used the North-East rate.*

*Note 2: For the same reason we have had to use the average rate for Scotland*

*Note 3: For the same reason we have had to use the average rate for the South-West.*

*Source ONS/Nomis*

6.21 Table 6.2 shows that four of the plants are located in areas where the unemployment rate is above the average rate for Great Britain, which itself is 6.9 per cent. We think the unemployment effects in these four areas would be particularly severe because it would be particularly difficult to replace the lost jobs.

6.22 The suppliers of specialist resins would clearly be affected by the demise of the wood panel industry. The number of jobs involved is not great: Dynea and Hexion together employ 240 people, and Huntsman is an importer, not a UK manufacturer.

- 6.23 Upstream firms include, most significantly, forest and woodland owners and sawmills. Under one scenario, it is hard to see that there would be severe employment impacts here since the loss of consumption by the wood panel manufacturers would be, in principle at least, replaced by demands from electricity generators. Indeed, given the very large quantities of wood input required by generators, it is foreseeable that employment in forestry and sawmilling might increase. However, where the effects are beneficial they are unlikely to be uniform, since the locations of some sawmills will make it uneconomical for generators to source from them.
- 6.24 Possible moves towards oligopoly ownership might well have employment effects but it would be futile to speculate on these at this point. More concerning would be the possible “Tesco-isation” of material inputs – a degree of control over suppliers which has resulted over many years in such pernicious abuse as to require a Competition Commission inquiry, a new and more rigorous Supply Code of Practice, and the prospect of an Ombudsman to enforce it.
- 6.25 But even this assumes that the structure and ownership of sawmilling remains much as it is now, and that seems to us questionable. The second – and more plausible – scenario we consider is one in which the large generators effectively buy the whole tree.
- 6.26 The Clegg report shows that there will be significant shortages of UK supplied product. The price paid could thus increase to about the level paid for imported chips and pellets (currently between £75 and £90 per tonne). If it did, buying the whole tree would be the cheaper option, and against that background the sawmilling sector shares the WPIF’s concerns as regards future availability of product to process. Forestry buy-up by the large vertically integrated generators (which we understand has already started) will effectively lock out other users. If wood inputs cease to be available to sawmills, they will close as surely as will wood panel plants.<sup>15</sup>
- 6.27 Even under the first scenario there would predictably be some structural changes in forestry and sawmilling as the large generators sought closer control of essential inputs through possible vertical integration. Indeed, it is striking that since break-up and privatisation in the 1990s the electricity supply industry has gravitated back strongly towards vertical integration.
- 6.28 There might well be environmental impacts too, as management objectives change, but these lie entirely outside our remit.

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<sup>15</sup> *The Times* of November 18 2009 reported that “Britain’s second-biggest energy company [SSE] plans to buy a Scottish forest to help to feed its growing network of biomass-fired power stations, *The Times* has learnt...The move reflects a scramble by British utilities to secure timber supplies to burn in biomass electricity plants, which are rewarded by lucrative subsidies. An SSE spokesman said that the company was studying opportunities to invest directly in Scottish forestry, but declined to offer further details.” (See [http://business.timesonline.co.uk/tol/business/industry\\_sectors/utilities/article6920848.ece](http://business.timesonline.co.uk/tol/business/industry_sectors/utilities/article6920848.ece)). SSE is believed to have purchased Acharossan Forest - approx 1,000ha in Argyll.

- 6.29 It seems inevitable that the supply chain for wood panels would lengthen if UK panel manufacture ceased. There would thus be an additional carrying cost involved, irrespective of the price impacts that might arise. Base prices, however, seem to us likely to be determined on world markets, as they are now, since wood panels are freely tradable (and are traded) across borders.
- 6.30 Downstream, and in the absence of UK manufacturing, the effects on hauliers, warehouse operators and distributors would depend on how wood panels found their way to UK users. We have recorded that about one third of wood panel consumption in the UK is met by imports, from which it must follow that some sort of warehousing and distributing infrastructure is already in place. If so, we would expect an increase in employment in these services.
- 6.31 There would inevitably be some increase in the costs of those sectors which use wood panels, principally (though not only) construction. It must follow that such increases would ultimately be borne by consumers, although the extent of any such increase seems to us likely to be small.
- 6.32 In principle hauliers might expect to gain from the widespread use of wood inputs by generators, though for the very large quantities involved it is possible that rail freight might to some extent – possibly to a considerable extent – supplant road haulage. Kronospan already uses rail freight to deliver wood input from Carlisle to Chirk. Power stations already use merry-go-round trains to deliver coal, and there is no obvious reason why trains should not deliver bulk wood input.
- 6.33 At this stage the likely impacts on road haulage of the demise of the wood panel industry are unclear. It seems plausible that the impacts will be felt mainly at a local level, in that the energy companies may prefer to contract with larger hauliers.<sup>16</sup>
- 6.34 As we have already said, to the extent that the generators' demands for wood inputs are met from UK sources, there could be employment increases in the upstream industries. It would be very hard for us to forecast these from existing knowledge.<sup>17</sup> Any such forecasts would depend critically on what percentage of wood input would be imported and on how the generators would organise a supply chain for UK-originated material.

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<sup>16</sup> We understand from WPIF that Eddie Stobart has just signed a substantial deal with A.W. Jenkinson (wood chip suppliers) to supply wood to seven generating sites.

<sup>17</sup> The Forestry Commission provides a summary in *Forestry Facts and Figures 2009* of employment in forestry and related industries. Table 12 of that publication records that as at 2007 there were 13,000 employed in forestry itself, 12,000 in sawmilling, 12,000 in pulp and paper making, and 5,000 in wood panels – a total of 42,000. The total of 5,000 employed in wood panels is not a figure that we recognise so we place no reliance on it in this study.

## 7 OPTIONS

- 7.1 As we have shown, the source of problems for the wood panel industry is the effective subsidy paid to generators which enables them to outbid wood panel manufacturers for the essential inputs that they need. Furthermore, the very large volumes of wood inputs that the generators need to satisfy their current plans, let alone service further biomass burning, dwarf the volumes needed for wood panels. Wood inputs are a matter of survival for the wood panel industry but make only a marginal difference to the contribution that generators make to the UK's emissions of greenhouse gases.
- 7.2 In our view curtailing the subsidy to a level where generators and wood panel manufacturers would at least compete on level terms for available UK and imported inputs would be the right economic solution.
- 7.3 The government believes that there will be sufficient biomass in aggregate, from UK and imported sources, to satisfy the demands of all competing users. That may well be the case (although it is not proven) but within the overall picture are micro-situations in which supply of specific products to specific users is highly problematic. The supply of wood inputs to the panel industry is one such, and it needs to be dealt with.
- 7.4 From an economics point of view, the overarching need is to correct the distortion induced by the payment of so large a subsidy to the generators. Remedies would logically be chosen from among the following :
- no ROC to be awarded for any biomass burning; or
  - no ROC to be awarded for the burning of any biomass material where there are competing uses for it; or
  - no ROC to be awarded for burning designated biomass (such as those inputs that the wood panel industry needs).
- 7.5 We understand from the WPIF that such remedies have already been rejected by government, though we believe firmly that they are the right way to end the distortion. Nevertheless we move on to recommendations that are still potentially susceptible to adoption. These are essentially two-fold.
- 7.6 The first is to modify the ROC banding in such a way as to favour the burning of imported wood products. This would go some way towards relieving the distortion, induced solely by the subsidy to electricity generators, in the market for domestic supplies.
- 7.7 The second is to extend support under the Renewable Heat Initiative (RHI) to cover wood combustion plant installed by wood panel manufacturers before 2009. The wood panel industry makes a sizeable contribution to UK CO<sub>2</sub> reduction targets through the RHI, since, from its inception, the industry has been using biomass derived from its own process residues to generate process heat. In 2009 the amount of renewable heat thus

## *Options*

generated was 1.6Twh – a contribution that stands to be lost or significantly undermined by the RO policy.

- 7.8 As the RHI terms stand now, plant already installed would attract no support, while identical equipment installed this year or later would attract full support. We see no justification in principle for the differing treatment.

## APPENDIX 1: PRINCIPAL DATA SOURCES USED

- A1.1 **Wood Fibre Availability and Demand in Britain, 2007-2025, John Clegg Consulting Ltd, February 2010.** The purpose of this study is to provide an up-to-date assessment of the types and quantities of wood fibre that are potentially available and the scale of the potential demand from both the forest and wood energy industries over the next 15 years. Where information was not supplied by the companies directly, estimates of wood fibre requirements were made by industry sources, or by using publicly announced information.
- A1.2 **Wood Waste Market in the UK, WRAP, August 2009.** WRAP (Waste & Resource Action Programme) is a not-for-profit company backed by government funding from England, Scotland, Wales and Northern Ireland. The Wood Waste report looks at wood waste arising in the UK by volumes of wood consumed by various industries. Two approaches were employed: firstly a bottom up approach by carrying out an interview programme with industry players within wood consuming and wood waste generating sectors; and secondly a top-down approach which analysed wood waste arising by applying waste factors to volumes of wood consumed by various industries.
- A1.3 **UNECE/FAO Forest Products Annual Market Review, 2008-2009.** This review provides general and statistical information on forest products markets in 2008 and early 2009 in the UN Economic Commission for Europe region (Europe, North America and Eastern Europe, Caucasus and Central Asia).
- A1.4 **European Panel Federation Annual Report 2008-2009.** EPF's annual report provides information and statistics on the particleboard, MDF and OSB industries in the EPF member countries and in other parts of the world.
- A1.5 **Ofgem, Renewables Obligation: Annual Report 2008-09.** This report provides information on the on how licensed electricity suppliers complied with their obligations in this period, the number of ROCs issued and detail on generators accredited for the schemes.
- A1.6 **Study on the End-User Markets of Particleboard, MDF and OSB, European Panel Federation, September 2007.** This study is the result of a survey aimed at finding end-users' preferences.

## APPENDIX 2: INPUT-OUTPUT TABLES AND CALCULATIONS

A2.1 We set out first the basic input to the I-O Tables, which consists solely of £520 million of revenue – the estimated value of output of the UK panel manufacturers. This is known as the Direct Impact.

A2.2 The sectors shown below are those which central government uses in impact assessments.

**Table A2.1 Direct Impact**

	Output (mils. £)
Agriculture	0.00
Mining and quarrying	0.00
Manufacturing	520.00
Electricity, gas and water supply	0.00
Construction	0.00
Wholesale & retail trade	0.00
Transport and communication	0.00
Financial intermediation	0.00
Public administration	0.00
Education, health and social work	0.00
Other services	0.00

A2.3 On the next page we set out in Table A2.2<sup>18</sup> what is known as the Leontief Inverse Table (named after Vassily Leontief, the Russian/American Nobel Prize-winning economist who developed Input-Output analysis). This table tells us how a change of £1 in the output of each sector could be expected to affect the output of all the sectors in the economy.

A2.4 Thus, for example, looking at the third column of the table, if the manufacturing sector increased its output by £1, the outputs of the agriculture, mining and quarrying, and manufacturing sectors would increase, respectively, by £0.0051, £0.028 and £1.355 (the first three coefficients in the manufacturing column). The output of the economy as a whole would increase by £1.849 (the coefficient at the bottom of the column).

A2.5 Then in Table A2.3 we show how the outputs of broadly-defined sectors would respond to a loss of manufacturing output of £520 million. The total impact is calculated as just over £961 million (bottom right of the table).

<sup>18</sup> United Kingdom Input-Output Analytical Tables, 1995, Table 8, National Statistics, 2002 Edition.

Appendix 2: Input-Output Tables and calculations

Product	Product group										
	1 Agriculture [1-3]	2 Mining and quarrying [4-7]	3 Manufacturing [8-84]	4 Electricity, Gas and water supply [85-87]	5 Construc- tion [88]	6 Wholesale and retail trade [89-92]	7 Transport and com- munication [93-99]	8 Financial intermed- iation [100-114]	9 Public adminis- tration [115]	10 Education, health and social work [116-118]	11 Other services [119-123]
Agriculture	1.138	0.005	0.051	0.004	0.011	0.016	0.006	0.004	0.005	0.007	0.007
Mining and quarrying	0.009	1.061	0.028	0.211	0.018	0.008	0.008	0.005	0.006	0.005	0.005
Manufacturing	0.302	0.125	1.355	0.110	0.280	0.173	0.125	0.087	0.120	0.103	0.120
Electricity, gas and water supply	0.026	0.024	0.037	1.462	0.020	0.020	0.018	0.012	0.019	0.017	0.014
Construction	0.021	0.068	0.014	0.028	1.341	0.019	0.018	0.046	0.072	0.010	0.017
Wholesale & retail trade	0.091	0.030	0.085	0.031	0.055	1.052	0.046	0.029	0.030	0.027	0.033
Transport and communication	0.053	0.063	0.073	0.039	0.059	0.163	1.244	0.102	0.061	0.049	0.079
Financial intermediation	0.161	0.195	0.185	0.160	0.275	0.251	0.237	1.304	0.153	0.112	0.245
Public administration	0.002	0.002	0.001	0.001	0.002	0.002	0.003	0.007	1.001	0.001	0.002
Education, health and social work	0.013	0.003	0.007	0.006	0.007	0.008	0.011	0.013	0.025	1.055	0.021
Other services	0.019	0.007	0.013	0.007	0.008	0.011	0.013	0.015	0.019	0.015	1.139
<b>Total</b>	<b>1.836</b>	<b>1.584</b>	<b>1.849</b>	<b>2.060</b>	<b>2.075</b>	<b>1.724</b>	<b>1.729</b>	<b>1.624</b>	<b>1.511</b>	<b>1.400</b>	<b>1.681</b>

Product	Product group											Total
	1 Agriculture [1-3]	2 Mining and quarrying [4-7]	3 Manufacturing [8-84]	4 Electricity, Gas and water supply [85-87]	5 Construc- tion [88]	6 Wholesale and retail trade [89-92]	7 Transport and com- munication [93-99]	8 Financial intermed- iation [100-114]	9 Public adminis- tration [115]	10 Education, health and social work [116-118]	11 Other services [119-123]	
Agriculture	0.000	0.000	26.738	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	26.738
Mining and quarrying	0.000	0.000	14.342	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.342
Manufacturing	0.000	0.000	704.481	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	704.481
Electricity, gas and water supply	0.000	0.000	19.203	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	19.203
Construction	0.000	0.000	7.253	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.253
Wholesale & retail trade	0.000	0.000	44.345	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	44.345
Transport and communication	0.000	0.000	37.749	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	37.749
Financial intermediation	0.000	0.000	95.977	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	95.977
Public administration	0.000	0.000	0.732	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.732
Education, health and social work	0.000	0.000	3.684	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.684
Other services	0.000	0.000	6.940	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.940
<b>Total</b>	<b>0.000</b>	<b>0.000</b>	<b>961.445</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>961.445</b>

A2.6 Next we set out in Table A2.4 the standard coefficients of employment, i.e. the average ratio of employees per £ million of sector revenue.

**Table A2.4 Employment coefficients**

Sector	Turnover (£mil)	Employment ('000)	Empl. Per £mil turnover
Agriculture, hunting and forestry	3,054	73	23.90
Fishing	976	12	12.30
Mining and quarrying	30,902	70	2.27
Manufacturing	447,178	3,534	7.90
Electricity, gas and water supply	47,651	122	2.56
Construction	152,403	1,323	8.68
Distribution industries	822,221	4,941	6.01
Hotels and restaurants	54,469	1,881	34.53
Transport, storage and communication	189,722	1,600	8.43
Real estate, renting and business activities	293,824	4,371	14.88
Education	17,116	3,163	184.80
Health and social work	18,533	998	53.85
Other community, social and personal service industries	102,131	1,347	13.19
	2,180,180	23,435	10.75

A2.7 And finally we set out in Table A2.5 our estimates of the job losses that would result if the industry ceased to exist: 8,664 gross and 4,458 net. (This is Table 6.1 as already shown in Section 6.) We make the assumption that sectors would respond in the same way to changes in the output of the wood panel industry as it would to changes in the manufacturing sector as a whole. The output multiplier for the wood and wood products industry (I-O industry 31) is very similar (1.93, "United Kingdom Input-Output Analytical Tables, 1995, Multipliers Table, National Statistics, 2002 Edition) to that of manufacturing (1.85, see Table A2.2).

**Table A2.5: Estimated job losses (net of re-absorption if the industry ceased to exist)**

<b>Direct Employment</b>	
Output (£m)	520
Direct employment at WPIF members	2,343
Direct employment after reabsorption (2343 less 52%)	<b>1,125</b>
<b>Indirect Employment</b>	
Total gross employment effect from I-O tables	8,090
Less employment by WPIF members	2,343
Indirect employment	5,747
Indirect employment after reabsorption (5747 less 52%)	<b>2,758</b>
<b>Induced Employment</b>	
National Income Multiplier (10%)	1.1
Induced Employment (10% of 5747 above)	<b>575</b>
<b>Grand Total</b>	<b>8,664</b>
<b>Grand Total (after re-absorption)</b>	<b>4,458</b>