WOOD FUEL TASK FORCE 2

THE SUPPLY OF WOOD FOR RENEWABLE ENERGY PRODUCTION IN SCOTLAND

AN UPDATE REPORT BY
THE WOOD FUEL TASK FORCE
TO SCOTTISH MINISTERS

March 2011

1. Introduction

This is the report of the reconvened Wood Fuel Task Force to Scottish Ministers. The report is set out as follows:

- Background, progress, and terms of reference
- Updated estimates of available volume
- Discussion
- Conclusions and recommendations

2. Background

Wood Fuel Task Force

The role of the original Wood Fuel Task Force (WFTF1), which reported to the Scottish Government in January 2008, was:

- To identify and quantify currently under-exploited sources of woody material suitable for wood fuel.
- To identify barriers to accessing the sources of woody material and propose actions to overcome these barriers, in the short and long-term, in relation to woody material from: established forests (such as thinnings, brash, deadwood and stumps); small and neglected woodlands; short rotation coppice and energy forestry; arboricultural and landscaping activities; and recycled wood & waste wood.
- To advise on any environmental limits to exploiting wood resources.
- To advise on the impact of market price and trading mechanisms on supply from these sources to wood fuel and other processing sectors.
- To advise on the range of technological and utilisation issues involved in making best use of the wood fuel resource.

WFTF1 – Actions

The Task Force made 25 recommendations to the Scottish Government on actions to mobilise the wood fuel supply. The Government published a response to the report in May 2008, which accepted nearly all the recommendations and put in place a programme of activities to take forward the actions. These included:

- Setting up a major Energy Forestry Trials programme at 6 sites across Scotland.
- Maintaining and updating the list of woodfuel suppliers in Scotland, available on the Usewoodfuel Scotland website[1].

[1] www.usewoodfuel.co.uk

- Improving estimates of waste wood and arboricultural arisings in Scotland.

- Launching the £3.3 million Scottish Biomass Heat Scheme in December 2008, providing capital grants to small-medium sized enterprises for woodfuel heating systems.

- Increasing woodland creation grants and recently launching the concept of leasing agricultural land for new planting.

- Publishing guidance on brash and stump harvesting.

- Publishing guidance on consents for developers of large-scale biomass projects and setting up a heat mapping pilot with Highland Council.

The Wood Fuel Task Force Report and the Scottish Government Response are available on Forestry Commission Scotland's website[2].

A full list of the recommendations of the Wood Fuel Task Force and actions following these is set out at Annex 1.

Terms of reference – WFTF2

The actions put in place in response to the Wood Fuel Task Force Report are helping to develop the wood fuel sector and mobilise wood fuel supply. However, the sector has moved on considerably since 2008 and a number of new issues have emerged. Scottish Ministers therefore asked Forestry Commission Scotland to reconvene the Task Force. The agreed terms of reference for Wood Fuel Task Force 2 (WFTF2) are:

- Review progress in taking forward recommendations from the Wood Fuel Task Force Report, January 2008

- Update the first Wood Fuel Task Force's estimate of the volumes of material available to the sector

- Highlight new and emerging issues, making recommendations about how they should be addressed

- Provide expert advice to Ministers on the wood resource and the blend of support for biomass for energy

- Report to Ministers by the end of January 2011.

The membership of the WFTF2 is set out at Annex 2.

[2] www.forestry.gov.uk/website/forestry.nsf/byunique/infd-7apfxa

3. Updated estimates of available volume

Background

Since publication of the WFTF1 report, work has continued to improve estimates of resource availability. Revised assessments of the wood fibre resource, consumption and potential net availability are set out in Tables 1-3 in Annexes 3-5, detailing the data sources and assumptions made. The tables broadly follow the layout in the first report. Amendments to the figures from the original report are highlighted in bold in the tables.

The wood fibre resource

Table 1 in Annex 3 sets out the Wood Fuel Task Force's updated assessment of the total estimated potential resource, together with comments on the source of the figures.

By far the largest resource is the softwood harvest. The Forestry Commission's 2005 Softwood Production Forecast anticipates the greatest additional availability from private sector woodlands. However, these figures need to be treated with a degree of caution for two reasons:

- Forecast results for the Private Sector represent estimates of **potentially** available volume, rather than forecasts of actual production. These estimates are based on the full productive potential of the growing stock.

- The volume estimates are based on information about the species composition of forest stands obtained from the National Inventory of Woodland and Trees (NIWT), which was carried out between 1990 and 2003. This Inventory did not capture timber volume data at a stand level. Instead the inventory data was combined with a set of prescriptions seeking to describe management and restocking in the private sector.

  Private woodlands encompass a multiplicity of ownerships and the prescriptions were intended to represent the broad patterns of stand management and restocking in the private sector rather than specific individual or collective plans to harvest timber at a particular time.

Work by the Forestry Commission is now well underway on the new 2011 Softwood Production Forecast, which is due for publication towards the end of 2011. The new Production Forecast will provide more accurate data on the private sector resource and as well as more accurate estimates of the amount of brash and branchwood available. A national hardwood forecast will follow in 2013. Both the softwood and hardwood production forecasts form part of the new National Forest Inventory (NFI). Information on the NFI is available on the Forestry Commission's website[3].

[3] www.forestry.gov.uk/forestry/INFD-89PJU5

Since the publication of the WFTF1 report, two reports on waste and arboricultural arisings have been published:

- In 2009, Remade Scotland's report to the Scottish Government, *Arisings of Waste Wood from the Scottish Waste Management Industry for the Development of the Biomass Industry*[4] put the theoretical maximum volume of waste wood in Scotland at 602,234 oven dried tonnes. This compares to a figure of 5 million oven dried tonnes included in the WFTF1 report.

- A study on arboricultural arisings resources was commissioned by Forestry Commission Scotland for the Regional Biomass Advice Network (RBAN) project. The report *Arboricultural Arisings Scotland*[5], carried out by ISL Ltd, was published in October 2010.

The projected increase in production from short rotation coppice (SRC) has been removed because of very limited uptake. It is unlikely that there will any significant volume produced from SRC in Scotland in the foreseeable future. There is growing interest in short rotation forestry (SRF). However, production of any significant volumes would be beyond the timescale shown in Table 1.

Material already committed to existing markets

Table 2 in Annex 4 provides an updated assessment of the volume of wood fibre currently being used by the market together with comments on the source of the figures. The demand for virgin fibre in Scotland in 2009 was 2.6 million odt, 0.3 million odt less than when the market was at its height in 2007. Some brash and branchwood is now being harvested by one major forest management company but is still only a fraction of the estimated potential resource. The two recent reports on arboricultural arisings and recycled/waste wood provide the estimated volumes supplied to existing markets. For recycled/waste wood this represents an estimated 35% recovery rate.

Estimates of additional future demand in the main wood using sectors are set out in the second part of Table 3 in Annex 5.

Potentially available material and forecast future demand

Table 3 in Annex 5 sets out the potentially available material by deducting the committed volumes in Table 2 from the estimated wood fibre resource in Table 1. The table indicates that there are potentially significant uncommitted volumes in the traditional softwood resource including brash/branchwood and the recycled/waste wood stream.

The second half of the table highlights likely additional demand from a number of sectors over the next few years as set out in the commentary in the Annex. For the wood panel and sawmilling sector, whilst increases of e.g. 20% over

[4] www.remade.org.uk/reports/materials/wood/wood-waste-from-the-scottish-waste-managment-sector-(may-2009).aspx
[5] http://www.usewoodfuel.co.uk/supplying-woodfuel/sources-of-supply/other-wood-resources.aspx

2010-11 might appear optimistic these are broadly comparable (around 0.4 million odt) with wood production levels in 2007 (0.3m odt higher than 2009 levels).

Forecast biomass demand and wood pellet production in 2010 is taken from the Woodfuel Demand and Usage in Scotland: Report 2010[6] which was published by Forestry Commission Scotland on 5 October 2010. The report forecasts additional demand in 2010 of 300,000 odt over and above the 1 million odt used in 2009. This increase is from wood used directly for energy and from an increase in wood pellet production. In 2009, just under 60% of the biomass supply was either virgin material from Scottish forests or sawmill co-products.

In estimating future demand, Table 3 also accounts for large-scale projects in construction, specifically the CHP plant at Tullis Russell Papermakers' mill in Fife, scheduled to come into operation in 2013. The table **does not** include potential further demand from other biomass projects likely to be commissioned beyond 2010 and does not attempt to project increases in demand stimulated by new drivers such as the Renewable Heat Incentive.

Further demands on the wood fibre resource from biomass for energy are covered more fully in the Discussion below.

[6] www.forestry.gov.uk/website/forestry.nsf/byunique/infd-7tdhjn#woodfuelusage

4. Discussion

The following key issues identified by the Wood Fuel Task Force are discussed below:

- The available resource in Scotland
- Biomass policy and the renewable incentives
- Future biomass demand
- Global supply and demand.

The available resource in Scotland

Table 3 suggests that there are additional volumes of 0.4 to 1.2 million odt potentially available annually over the period to 2021. New woodlands will provide an important resource in the future but actual production from woodlands planted now, even short rotation forestry, is over a longer timescale than set out in this report. It is therefore essential to maximise recovery in the main areas of availability set out in Table 3 to meet the future demand from existing wood using industries and the growing demand from the biomass market.

Softwood resource

Table 3 suggests that the market for sawlogs and small roundwood will become tighter and that there will be a need to maximise the sustainable harvest from the increasing private sector resource. The 2011 Softwood Production Forecast will provide good quality data on the size of this resource.

Softwood brash/branchwood is a considerable potential resource. However, because recovery is at the higher end of cost for biomass and only a few, larger scale plants can take this type of material (and only as part of their fuel supply), high levels of recovery from this resource will be challenging in the short term. Forestry Commission Scotland remains committed to tendering brash contracts on the national forest estate when there is sufficient market demand. Further information on potential volumes on a regional basis will come in the Production Forecast but annual availability of brash volumes will always be dependant on the suitability of the sites being harvested.

There are likely to be some opportunities for stump harvesting but, in addition to its high cost, suitable sites are limited. Further work being carried out by Forest Research will provide better information on carbon balances and suitable soil types. We do not anticipate significant levels of stump harvesting because of cost and environmental constraints. In addition, the very disruptive nature of stump harvesting has the potential to create reputational issues, even on sites where the environmental risk is minimal.

Arboricultural arisings

Approximately 350,000 odt of material a year is produced from tree surgery, landscaping, forestry services and local authority green waste collections and civic amenity sites. Of this around 172,000 odt is woody material such as brash

and roundwood. Some of this material is used by existing markets and the volume composted has increased over the last few years to around 55,000 odt. Some of this material comes through the composting process as oversized material which is then used for bioenergy, but may also be a potential resource for heat markets if diverted prior to composting, particularly for local authorities. The figure in Table 3 includes only the material which does not currently have an existing market or go to composting.

Recycled/waste wood

The figures for the theoretical wood waste resource are taken from the Remade Scotland[7] report from 2009. The figures for demand have been updated to take account of increased industry use. However, the figure for availability should be treated with caution as Task Force members already using or recovering recycled/waste wood are concerned that the figures in the report - both on the size of the potential resource and the amount of material available - were too high and that most recoverable waste wood was now being used by timber processors or for bioenergy.

Task Force members felt that the WRAP *Wood Waste Market in the UK*[8] report (August 2009), which gave a figure of 330,000 tonnes for recycled/waste wood availability in Scotland, may be more realistic and reflect a more comparable per capita consumption of wood than the Remade Scotland report. If the WRAP figure was used then **only around 24,000 odt rather than 296,000 odt net would be potentially available**.

One of the key actions identified in the Scottish Government's *Scotland's Zero Waste Plan*[9] is to introduce a mandatory requirement to source segregate and collect recyclable materials and food waste separately by 2013, and a ban on the landfilling of biodegradable wastes by 2017. The Scottish Government recently consulted on these proposals.

The landfill tax escalator, which will increase the cost of landfill tax for biodegradable wastes from £48 per tonne in 2010/11 to £80 per tonne by 2014/15, will also help ensure that progressive amounts of waste are diverted from landfill. It is likely therefore that the vast majority, if not all, of the waste wood that remains within the mixed waste stream currently going to landfill will be available to energy-from-waste plants.

Biomass policy and renewable incentives

The Scottish Government has set a target for 11% of all heat demand to be renewable by 2020. The Sustainable Development Commission's report for the Scottish Government on renewable heat estimated that renewable heat use was 1.4% in 2008/09. The report stated that "biomass boilers, predominantly burning virgin wood fibres and some wood waste, provide 86% of the existing

[7] www.remade.org.uk/reports/materials/wood/wood-waste-from-the-scottish-waste-managment-sector-(may-2009).aspx
[8] www.wrap.org.uk/downloads/Wood_waste_market_in_the_UK.c925583e.7547.pdf
[9] www.scotland.gov.uk/Publications/2010/06/08092645/0

renewable heat. Three large industrial sites engaged in wood processing provide over 50% between them."

As a preliminary estimate of progress towards the target, the projected biomass usage in Table 3 for 2013 would be 2.5% of Scotland's total heat demand (a total of 2.8% renewable heat assuming no change in other sources).

An estimated additional 1.3 million odt of woody biomass would be required to meet the remainder of the renewable heat target, if it was delivered by heat only applications.

The Task Force supports Scottish Government policy to promote the use of wood fuel in CHP applications but recognises that plants should be at an appropriate scale to use the heat. The lower the ratio of heat use to electricity production, the greater the volumes of biomass will be required to raise the same amount of heat.

As a broad comparison, if the heat target was to be delivered through Combined Heat and Power (CHP) plants only:

- Where heat production/use in CHP plants is maximised, in theory, an additional 3 million odt would be needed
- Where heat production/use is limited, in theory, an additional 10 million odt would be needed.

The Task Force notes that a key target for renewable heat is the industrial sector and wood fuel could contribute significantly, as there are few other renewable solutions for process heat applications.

Almost all the Task Force members take the view that care needs to be taken to ensure that the most effective use is made of the finite wood resource and, in general terms, large scale electricity only biomass plans are not an efficient use of the resource. The Task Force supports the Scottish Government's policy position, prioritising biomass for renewable heat, as set out in the Draft Electricity Generation Policy Statement 2010 published in November 2010[10].

Almost all members of the Task Force approve of the Scottish Government's plans to review the blend of incentives available for biomass for heat and power in 2011.

Members of the Task Force are concerned about the potential displacement of the existing wood industries because of heightened biomass demand. This sector is important to Scotland's economy, produces sustainable low carbon timber products and already makes a significant contribution to Scotland's renewable heat use.

The Task Force has noted the Scottish Government's decision to grandfather biomass following the recent public consultation. Of the Task Force, only ConFor strongly disagrees with that decision, believing that it sends out the wrong message to large scale biomass developers.

[10] www.scotland.gov.uk/Publications/2010/11/17094217/0

The Task Force welcomes the announcement by the UK Government on 10th March of details of the Renewable Heat Incentive, but is disappointed by the delays and would encourage the Scottish Government to press the UK Government to deliver the scheme quickly to prevent damage to the emerging biomass heat sector in Scotland.

The Task Force has noted that work is underway on developing biomass sustainability criteria for heat and electricity. The Task Force agrees that demonstrating sustainability is essential to ensure that biomass maintains its reputation as a low carbon, renewable fuel. Some members, involved in biomass supply, emphasise that the focus of the criteria should be on the UK Forestry Standard rather than certification because of the diverse nature of the fuel sources.

Future biomass demand

A number of large-scale biomass plants are at various stages of development and the Renewable Heat Incentive will generate further growth of the heat sector. The John Clegg Consulting study of Wood Fibre Availability and Demand in Britain 2007-2025[11], commissioned by the wood processing and supply industries, estimated that the potential wood fibre demand for biomass could be 27 million green tonnes by 2017 (almost double the current global trade in wood chip and pellets) if all current and known proposals for biomass plants are built.

In Scotland, the most widely reported proposals for large-scale electricity generation are the four 100 to 200 MWe biomass power stations proposed by Forth Energy which are currently in planning. Each plant would use around use around 1 million green tonnes per 100 MWe capacity. Other high profile projects include Peel Energy's proposals for a new coal fired power station at Hunterston in Ayrshire which proposes to use around 800,000 tonnes of wood pellets. Such larger projects are predicated on sourcing much of the supply from overseas.

In Scotland, the Wood Fuel Demand and Usage in Scotland: Update Report notes that if all the proposed developments in Scotland with a probability of 50% or greater (based on the developers' own assessment), come to fruition then the demand for woodfuel would increase by around 3.5 million odt per year by 2015.

The second part of Table 3 in Annex 5 is a conservative estimate of future biomass demand. It only accounts for the additional demand that was expected in 2010 together with a proportion of the supply required for the Tullis Russell plant from 2013. **Additional proposed capacity in planning and development is not included.** The table therefore gives a fairly clear picture of likely maximum net availability subject to the caveats around the figures and issues around the recovery of wood fibre discussed above.

Global supply and demand

Given that large scale biomass proposals in the UK are mostly based on the use of imports, there are a number of general issues that need to be considered:

[11] www.confor.org.uk/NewsAndEvents/Default.aspx?pid=271&id=0

- Can the global resource satisfy UK demand in the light of likely competition for the material from other parts of Europe and North America?
- Is there sufficient domestic wood fibre to provide e.g. 10% of the fuel supply that many of the UK proposals intend to source?
- If imported material is either not present in sufficient volume or the price is greater than domestic fibre, what is the likelihood of domestic wood fibre being displaced from:
    - existing wood processing industries?
    - the priority of delivering the renewable heat target?

Broadly speaking, there appear to be opportunities in the short term to import material from the south eastern states of North America, western Russia and South America at a potentially competitive price. However, there is a risk that competing demands for imports from other parts of Europe, which also have sizeable ambitions for biomass energy, or North America, will bring about problems with price and availability in the medium term. This fast growing but immature global market could be very volatile over the next five to ten years.

Therefore there seems to be a danger in excessive dependence on obtaining large volumes in imports from relatively untested markets. Given the likely competition for a sustainable, affordable supply, it is likely that many of the biomass plants proposed will not be built, adding further uncertainty to the projections.

Cost issues will be paramount in determining how much of the material comes to the European and UK market. It seems likely that imported wood pellets will be more expensive than the domestic wood fibre used by the existing wood processing industries with the potential for significant consequences for those industries if there is wood fibre displacement. Both domestic and imported wood fibre is ultimately a finite resources, so it makes sense also to use this material in as efficiently as possible.

The Task Force believes that biomass policy, rather than making a dash for biomass through a series of large scale electricity only power stations, should encourage the incremental growth of the biomass industry, focussing on heat and combined heat and power, and avoiding lock in of the resource to a small number of large plants.

5. Conclusions and recommendations

This report, taking into account forecast increased demand in the wood processing and biomass sectors in the short term, sets out net maximum availability of wood fibre of 0.4 million odt in 2010/11, 0.9 million odt in 2012-16, and 1.2 million odt in 2017-21. However, much of this additional material, particularly in the current period is in the recycled and waste wood and softwood brash/branchwood resource. The former may be more difficult to recover and the latter will be more difficult to use. Only large plants can use brash and that only in relatively small quantities whilst small and medium sized biomass heat installations generally require high quality virgin fibre. This report also highlights that the recycled and waste wood resource may be smaller than the Remade Scotland report suggests.

This report estimates that if domestic wood fibre was to deliver the 11% renewable heat target by 2020 using heat only applications, a minimum of 1.3 million odt would be needed. If the renewable heat target was to be met using CHP plants where heat production/use is maximised, potentially 3 million odt or more would be needed. Where heat production/use in CHP plants is limited potentially 10 million odt or more would be needed.

The additional demand in Table 3 of the report **does not include** further large-scale biomass capacity in planning and development. Most widely reported are the Forth Energy proposals for four large scale biomass plants totalling 600 MWe requiring a fuel supply of around 3 million odt. Initially, Forth Energy plans to use domestic wood fibre for 10% of its fuel supply moving ultimately to 30%. If all four plants were built this would equate to an additional demand for around 0.3-0.9 million odt which has not been factored into the tables in the Annex.

There is the further danger that the UK Government's extremely ambitious plans for large scale biomass plants using wood in the rest of the UK will encourage wood fibre, currently required by existing wood users or to help meet Scotland's renewable heat target, to be diverted southwards to those large plants.

These figures show that there is no capacity to support further large scale electricity generation biomass plants from the domestic wood fibre resource.

The publication of the new Softwood Production Forecast at the end of 2011 will provide an important update on potential availability of the softwood resource, the largest single area of supply.

The Wood Fuel Task Force:

A. Recommends that the development of the biomass industry in Scotland follows the approach adopted by the Scottish Government, prioritising the development of renewable heat at a scale appropriate to local supply

B. Recognises that CHP plants should be at an appropriate scale to use the heat most effectively

C. Recommends that the tables in this report be updated following the publication of the 2011 Softwood Production Forecast

D. Recommends that the Scottish Government highlights to the UK Government the need for swift and effective implementation of the Renewable Heat Incentive to avoid damage to the emerging biomass industry in Scotland

E. Approves of the Scottish Government's plans to review the blend of incentives available for biomass for heat and power in 2011

F. Believes that there is insufficient domestic supply to provide even a fraction of the fuel supply needs of the UK Government's very ambitious plans for large scale biomass in the rest of the UK; and that such ambitions plans will displace domestic wood fibre from meeting renewable heat targets and the existing wood using industries

G. Believes that such ambitious targets for electricity generation using woody biomass are inappropriate given the significant uncertainty around the available volumes for biomass globally in the medium term and the likely competition for supply from other parts of Europe and North America; and believes that an incremental approach to developing the biomass market focussed around heat is more appropriate.

Annex 1

Recommendations of the Wood Fuel Task Force 1 and actions taken

	RECOMMENDATION	SG RESPONSE	ACTION
1	Demonstration sites and best practice examples need to be developed, to promote bioenergy as an additional opportunity to add to the many other benefits valued by owners and other stakeholders. This should be combined with an assessment of the likely impacts of short rotation coppice and/or short rotation forestry on land values, and the potential to maximise the amenity, conservation and shooting values. Dissemination should be via a series of regional advertising and awareness raising campaigns.	The Government agrees that increased understanding and awareness of opportunities is a prerequisite to successful adoption and development. FCS will set up a series of demonstration sites across the country to initiate this process.	Energy Forestry Trials have been established on 5 sites, with 1 more to be established in 2011/12. Details of progress to date, full establishment guidance and details of research being carried out at the sites is available at www.forestry.gov.uk/forestry/INFD-85UFMB.
2	Delivering the information via a single "Scottish Forest Industry" wood fuel website, which provides a single reference point with a regularly updated definitive data set on woody biomass using common terminology. This should be accessible in a freely available GIS layer to: assist in planning and targeting future woodfuel developments to make regional resource estimates, where appropriate, available to potential woodfuel buyers and farmer co-	The Government agrees that a single source of accessible, up to date, and accurate information will stimulate development, reduce inefficiencies, and encourage the appropriate level of balance between suppliers and markets. FCS will work with other stakeholders to review the scope, focus and functionality of the Usewoodfuel Scotland website (www.usewoodfuel.co.uk) as a tool to provide a comprehensive information service for wood fuel.	A Scotland-wide Woodfuel Suppliers List is available at www.usewoodfuel.co.uk. The website has been completely redesigned, with an update woodfuel suppliers list. More spatial information will be included as that becomes available.

	operatives.		
3	An annual update of woodfuel usage in Scotland should be undertaken. In the longer term, a full review of woodfuel market development is needed in 2010 to assess progress, and determine if mechanisms and policies need to be changed.	The Government agrees this recommendation. Understanding how the industry is developing is an essential aspect of matching demand with the resource. FCS will undertake the annual assessment of usage.	The Woodfuel Demand and Usage Study: Upate 2010 was published on 5th October 2010 (see www.forestry.gov.uk/website/forestry.nsf/byunique/infd-7tdhjn#woodfuelusage)
4	A series of research projects to address specific needs in short rotation forestry, and forecasting volume from existing woodlands should be commissioned. The research must be carried out quickly and the information has to be effectively communicated through a series of specific seminars and training events.	The Government agrees that good quality research underpins sound project development and policy formulation, and new knowledge is urgently required in these subjects. Forestry Commission Scotland will monitor the demonstration trials in recommendation 1, and support work to improve the volume estimates. The findings will be communicated to industry on a regular basis.	Details of the Energy Forestry Trials have been published at www.forestry.gov.uk/forestry/INFD-85UFMB. An FCS/Forest Research seminar on the Energy Forestry Trials, was held in November 2009 with a further event being planned for June 2011.
5	Further work is required to improve the volume estimates of the potential resource from waste streams, and identify it in terms of location and type.	This will be included in the review of commercial and industrial waste, carried out bi-annually by SEPA. Spatial provision of this data will be a major aid to new business development, and consideration will be given to providing it in this format.	In 2009, Remade Scotland published *Arisings of Waste Wood from the Scottish Waste Management Industry for the Development of the Biomass Industry* (www.remade.org.uk/reports/materials.aspx). Additional research published by SEPA is available at www.sepa.org.uk/waste/waste_publications/research_and_development.aspx.

			FCS has also published a report on the availability and potential use of arboricultural arisings carried out by ISL Ltd for the RBAN project (www.usewoodfuel.co.uk).
6	A new 'wood for bioenergy' category should be inserted into WasteDataFlow, and improvements need to be sought in the data returns from licensed or permitted landfills for commercial and industrial waste wood and other biomass sources.	The Government agrees that improved information on municipal biomass waste will be welcome. Discussions with COSLA will be required to fully take this recommendation forward.	WasteDataFlow is a UK web-tool for reporting on waste collected by or on behalf of UK local authorities which includes household waste and a small proportion of commercial and industrial waste. The addition of a field for wood for bioenergy requires discussions with other UK administration on the addition of the field by the tool developer and the associated costs.
7	Direct canvassing of companies will help to improve the data on wood waste collected by landscape firms.	The Government feels that the practical way to take this recommendation forward will be via a market solution by brokering contacts between producers and buyers. Better understanding of the definition of what comprises waste, and dissemination of the information by biomass development officers will deliver improvements.	Through the RBAN project, a study has been carried out of arboricultural, landscaping and forestry services companies and has been published on the Usewoodfuel website (www.usewoodfuel.co.uk).
8	Improving knowledge on the potential for short rotation coppice on more marginal ground to set against growing concerns about food security. The development of a life cycle	The Government agrees that the use of a tool to aid land use policy development through a partnership approach will help to identify the carbon implications of any proposal to grow new biomass supplies.	The BEAT2 tools has been developed DEFRA, EA, AEA and North Energy and is available from the Biomass Energy Centre (www.biomassenergycentre.org.uk).

	assessment model to enable the calculation of carbon benefits /disadvantages from the various biomass growing/utilisation options would help to address some of these difficult issues. This is something that the Scottish Environmental Protection Agency, Scottish Natural Heritage and Forestry Commission Scotland with Scottish Government support should investigate developing jointly for the biomass sector.	SEPA will lead a review of the current models which are available, to identify the most suitable one to use.	The Forestry Commission and the Scottish Government are working with DECC on the development of sustainability criteria for biomass for heating and electricity, included in the current Scottish Government and UK Government Statutory Consultations on the Renewables Obligation Order 2011. The criteria will set a minimum carbon emissions reduction level for woodfuel and FC is putting together advice to DECC on suitable models for life cycle analysis including BEAT2 and Forest Research's forestry carbon models. The Energy Forestry Trials (see point 1) include SRC and are carrying out research on the carbon life cycle of the crop, soils, management and harvesting.
9	Price transparency is poor in the market. The task force considers it would be worthwhile to investigate the issues around setting up a market trading floor for biomass. This will help to determine whether it should be left to the market to provide this, or whether government support is appropriate to initiate the process.	The Government accepts that the immature nature of the market requires greater transparency to encourage positive market behaviour. This is an innovative recommendation, which is very much for industry to take forward as a market solution.	A study was commissioned through the RBAN project to explore the interest and practicalities of setting up a trading floor. A workshop was held in April 2010 to feedback back to industry stakeholders who had contributed to the report.

10	FCS should explore the potential to lead biomass development where market failure is evident. Other public and private bodies, such as the National Farmers Union, across a range of sectors should also take an exemplar role in developing and promoting the market for wood fuel.	The Government agrees that FCS will work with colleagues on the cross government bioenergy group to identify areas of market failure in the biomass sector.	FCS manages the RBAN programme, in partnership with Scottish Enterprise and SG. RBAN undertakes a range of activities aimed at addressing market failure, including building on and expanding forums of key stakeholders to improve networking and representation. FCS has also worked with the SG to deliver funding support through the Scottish Biomass Heat Scheme (SBHS) and SRDP Rural Priorities for biomass.
11	Support for producer groups and wood heat clusters continues, and their impact on the market is reviewed as part of a future study.	The Government supports this recommendation, and understands that it will be delivered through the new rural development contracts available under the Scottish Rural development Programme. In addition, development of the heat market and appropriate support will be considered in the response to the Forum for Renewable Energy Development in Scotland Renewable Heat report.	SAC have been appointed through the RBAN programme to bring together information on cooperative models of woodfuel supply and work with producer groups which are in development across Scotland. FCS is facilitating a number Regional Biomass Forums of stakeholders to help bring together local woodfuel supply clusters.
12	Long-term supply contracts and trading of woodfuel products using standardised measures and specifications become a priority for the industry. The potential for front-loaded contracts from biomass buyers	The Government recognises that long term contracts provide continuity and confidence between supplier and market. Industry needs to find mechanisms which encourage their development. FCS will assist industry by sharing its	CEN TC 335 for solid biofuels and CEN TC 343 for solid recovered fuels now available on the Biomass Energy Centre website. HETAS have also introduced a

	should also be explored as a means of providing confidence and cash flow to growers.	experience of developing these contracts over many years. There is also a close linkage with recommendation 16 on standardised measures and specifications.	biomass fuel quality scheme covering logs, wood chip, pellets and briquettes (www.hetas.co.uk)
13	FCS should work with management companies and woodfuel buyers to find mechanisms and identify areas with a reasonable chance of success, which will provide continuity of work for regional contractors, to encourage them to invest in skills.	The Government agrees that the shortage of suitable skills to produce and mobilise biomass is a concern. To encourage small businesses to invest in skills development and training, continuity of work both in terms of geography and scale are critical. The Government believes that a strong partnership approach by FCS and industry is necessary to address this and provide long term solutions to the issue. FCS will initiate discussions with management companies and woodfuel buyers to consider how best to resolve the issue, and strengthen the woodfuel supply chain.	FCS and industry were represented on the Scottish Funding Council's Renewable Energy Skills Group. The group will feed in to the FREDS Skills sub-group which is looking at the development of skills and training as part of the Renewables Action Plan. Support is available for skills through SRDP.
14	A review of the application of pre-treatment for landfill regulations is undertaken as an encouragement to the commercial and industrial waste producing sector to improve source segregation to maximise the availability of clean wood and increase awareness of opportunities to avoid landfill tax.	The Government accepts that, in principle, the concept is sound, though the approach would go beyond what is currently required in the directive on landfill. As for recommendation 6, further detailed discussion between the Scottish Government, SEPA, and COSLA will be required to take this forward.	SEPA have considered this issue and advise that the revised Waste Framework Directive (WFD), adopted by the EU on 20th October 2008, places a target of 70% on construction and demolition waste. Direct measure to improve segregation at construction and demolition sites would be more effective and be backed up by the

			Directive requirements. The Scottish Government consulted on transposition of the WFD in February 2010.
15	Appropriate infrastructure is developed to utilise arboriculture arisings as a wood fuel and avoid the material entering the waste stream.	The Government interprets this recommendation as relating to both the physical and market infrastructure. It sees good business opportunities in collecting and supplying this material to the Bioenergy market. The key to this will be in keeping the material out of the waste stream, by producers ensuring that it is not classified as waste in the first place. FCS biomass development officers will be crucial in promoting the use of this material into the energy stream.	The report by ISL Ltd, commissioned by Forestry Commission Scotland for the RBAN programme, on aboricultural arisings is available at www.usewoodfuel.co.uk. FCS Biomass Development Officers will disseminate the information regionally. We are working with LAs on their heating requirements and how they can use their own woodfuel resources, including arboricultural arisings.
16	Sufficient safeguards are put in place to protect and further develop existing wood recycling initiatives, which recognise the validity of wood as a renewable fuel. This is clearly a preferred route for this material in terms of overall energy balances. This would be helped by the development of a fuel standard from waste biomass to increase the amount of wood fuel drawn out of the waste stream.	The Government considers that this is largely a matter for the market to resolve. A wood fuel standard for waste biomass would be helpful in determining how what was originally classed as waste might be reclassified as a wood fuel product. BSI CEN/TC 335 solid biomass standards are now available through the Biomass Energy Centre, and SEPA will work with industry to add appropriate standards for waste biomass.	WRAP is developing publically available specifications (PAS) for post-consumer waste covering a range of end markets for wood including biomass.
17	The development of a branch wood	Much material which is currently left	FC has published guidance on brash

	and brash recovery grant will help to encourage growers to bring this material to market, and to do more thinning in their forests and woodlands.	after harvesting operations can be utilised in the energy stream. A properly targetted grant will help to mobilise this material where it is appropriate to do so. FCS will develop: • protocols for sustainable harvesting of this material • proposals for introducing such a grant under the forestry measures of the SRDP.	removal and stump harvesting (www.forestresearch.gov.uk)
18	A commitment to sustaining a range of supply-chain capital grants and access and timber transport grants for the next 3-5 years. This would include the continuation of the Scottish Biomass Support Scheme (SBSS) and the Scottish Timber Transport Fund, in conjunction with rural development contracts.	The SBSS has been a very effective support scheme for developing both the supply and demand side of the bioenergy sector in Scotland. Substantial additional funding is available following the spending review for micro and community renewables. Ministers are currently considering future support for projects outside these categories and will take into account the value of the current SBSS scheme. There are alternative funding sources for bioenergy installations, which are currently available. These are: • the Scottish Community & Householder Renewables Initiative, • the low carbon buildings programme, and • the Energy Saving Trust. • Land managers will also be able to apply for 'Support for renewable energy' measures under Rural Development	The SRDP provides capital grants for supply chain development and for cooperative approaches to the supply chain. The £3.3 million Scottish Biomass Heat Scheme was introduced in 2009 to support heat only installations in small-medium sized enterprises The UK Government is considering the options for long-term support for the demand side, following a public consultation on introduction of a Renewable Heat Incentive (RHI) in spring 2010.

		Contracts. The continuation of the Scottish Timber Transport Scheme has already been announced, with £15million of funding to be provided over the next three years.	
19	There is a need to increase the rate of new woodland creation for future biomass supplies. This can be done by ensuring that Rural Development Contract (RDC) incentives reflect land use priorities. The task force recommends a review of incentives in 2009 if uptake of RDC woodland creation grants is low.	Work is already underway to achieve this, and regular reviews will be part of the process.	FCS reviewed Woodland Creation grants in 2009 and increased the rate of grant to stimulate new planting. An ongoing approval process for Woodland Creation and Woodland Improvement grants, up to £750,000, has also been introduced. Other changes to RDCs are the removal of the 200 ha limit on Farm Woodland Premium and an increase of 10% in the grant rate for LFAs, from 70% to 80%. FCS are also now trialling the concept of leasing land from farmers and other land holders, establishing new productive woodland through Forest Enterprise Scotland and handing that woodland back to the land holder at the end of the lease period.
20	Incentives such as free or subsidised deposit for woody material at recycling centres to make it	The Government does not feel that it is appropriate to offer subsidies for disposal of waste. Some local authorities are	No action required.

	worthwhile for landscapers to transport the wood residues to council recycling centres.	already addressing this issue through the use of annual licences for operators. Under the Concordat, COSLA will require to be fully consulted before any wider measure can be applied.	
21	There is a need for improved grant aid to the SRC grower, particularly new support mechanisms, to bridge the establishment period for short rotation coppice.	The Government is not sure that additional grants will stimulate greater moves towards SRC. However it is committed to restoring the current level of grant through the SRDP, and will review this in 2010.	The current grant rates for SRC is 40% of actual costs (50% in LFAs) up to a maximum of £1,000. Further details are available at www.forestry.gov.uk/forestry/infd-7rllrl
22	Higher ROC banding for SRC converted via CHP systems is the key to developing the resource. FCS should monitor uptake of SRC establishment grants in the new SRDP and in the lead up to banded ROCs. This needs to be followed up with a review in 2010 and consideration of additional opportunities for support if uptake is still unsatisfactory.	FCS will monitor uptake, and review the position in 2010.	Uptake of SRC grants has been very limited, with less than 500 ha of SRC grant aided to 2009/10. However, additional support is unlikely to encourage further planting as uncertainty over markets for SRC material and lack of availability of suitable land are the key barriers.
23	More effective integrated planning to ensure new wood-fuelled developments are located (in so far as is possible) in areas where timber is readily available and energy facilities located where heat use is viable.	The Government agrees that in principle the concept is sound. However, this involves planning issues, which will require detailed consultation with COSLA and local authorities. The Government will consider this issue together with the recommendations from the Forum for Renewable Energy Development in Scotland on how to develop the	Further planning guidance on biomass is included in the Scottish Government's National Planning Framework (NFP2) published in June 2009 (see paragraph 148). Action 30 of the associated Action Programme is to "Promote decentralised energy production, develop local heat networks, combined heat and power

		renewable heat market sector. This will allow the contribution of biomass to be addressed in the context of an overall heat strategy to ensure that the appropriate balance between capacity to supply and demand for renewable heat is achieved.	and micro-generation". To promote the development of local heat networks, the Renewable Heat Action Plan, published in 2009, is being taken forward by the Renewable Heat Implementation Group and the Scottish Government is undertaking a heat mapping pilot with Highland Council. For projects falling under the Section 36 Consents process, the Scottish Government has published General Biomass Scoping Advice (www.scotland.gov.uk/Topics/Business-Industry/Energy/Infrastructure/Energy-Consents/Guidance).
24	That the potentially available material from arboriculture arisings is not classified as waste, and is treated the same way as green forest industry residues are. There should be a clear distinction between virgin (unprocessed) and waste material.	The Government feels that this is mainly an issue of understanding how the current regulations apply, in common with recommendation 15. SEPA will assist FCS biomass development officers to promote a wider understanding of what comprises waste, and what comprises a product. SEPA will develop a decision tree to aid and clarify this process.	SEPA's guidance on what is waste is available at www.sepa.org.uk/waste/waste_regulation/is_it_waste.aspx. The report on arboricultural arisings (see point 15) sets out the barriers to use of arboricultural arisings and makes recommendations on addressing them.
25	That council operated recycling	The Government agrees that this	The recent studies on waste and

	centres are required to offer waste biomass recovery services and that a study of incentive and charging options for such facilities is undertaken.	represents both a business opportunity as well as an additional responsibility for local authorities. Consultation between SEPA, the Government and COSLA will be required before this can be taken forward.	arboricultural arisings include information on the resources processed by LA waste centres. Through the RBAN programme FCS BDOs are working with both businesses and LAs to disseminate this information and mobilise the resource.

Annex 2

Membership of the Wood Fuel Task Force 2

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Andy Wiseman, Buccleuch Estates
Jamie Farquhar, ConFor
Les Bryson, Forest Enterprise Scotland
Cameron Maxwell, Forestry Commission Scotland (chair)
Rebecca Carr, Forestry Commission Scotland
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Annex 3

Table 1: Total Estimated Potential Resource

Type of material	2009/11 Oven Dry (t)	2012/16 Oven Dry (t)	2017/21 Oven Dry (t)	Ref.
Hardwood – Logs	112,500	110,700	103,400	1
Softwood (incl. logs, chips and SRW)	**2,819,200**	**3,333,400**	**3,657,300**	2
Softwood Brash / Branchwood	382,700	395,000	395,000	3
Softwood Stumps/roots	35,000	35,000	35,000	4
Small & Neglected woods	50,000	50,000	50,000	5
Arboricultural arisings	**172,100**	**172,100**	**172,100**	6
Short rotation coppice	**2,400**	**2,400**	**2,400**	7
Short rotation forestry	0	0	0	8
Recycled and waste wood	**602,200**	**602,200**	**602,200**	9
Total	**4,176,100**	**4,700,800**	**5,017,400**	

Table 1 comments

1. Data from *Wood fuel Resource: Study into the potentially available wood fuel resource of Great Britain* Helen McKay, FC 2003[12].

2. Figures from the Forestry Commission's 2005 Softwood Production Forecast[13] . It should be noted that Forest Enterprise Scotland's Strategic Plan 2009-13[14] commits to a 3.2 million m^3 sustainable annual harvest from the national forest estate. This is lower than that predicted in the 2005 Production Forecast and is largely the result of planning and operations to smooth the previously predicted bulge in production to 2020. The updated production figures in the Strategic Plan will be reflected in the 2011 Production Forecast.

The conversion factors have also been updated. Figures in odt are calculated by converting standing volume in m^3 figures firstly to green tonnes (conversion factor 0.818) and then to oven dried tonnes (conversion factor 0.5). This reduces the resource in odt by around 20% compared to the WFTF1 figures. The separate line for sawmill chips has been removed as this should not have been an additive figure in the WFTF1 report.

3. Data from "Forecasts of potential fibre production from FC Scotland woodlands" Robert Matthews, Forest Research unpublished report (2008).

4. In the first WFTF Report, a rough estimate of 35,000 odt was given for stump volume. This was for FCS land only and the data was from the

[12] www.eforestry.gov.uk/woodfuel
[13] www.forestry.gov.uk/forestry/infd-7m2eny
[14] www.forestry.gov.uk/forestry/infd-6pelhd

unpublished Forest Research report in 2008. The uncertainties around stump harvesting have been set out above.

5. This is a very rough estimate based on area and conservative volume production. The calculations and assumptions are set out in WFTF1 para 7.5.

6. These are updated figures from the *Arboricultural Arisings Scotland Study*[15] in 2010 for the Regional Biomass Advice Network project (RBAN) by ISL Ltd. This volume is made up of approximately 50% brash and 50% heavy timber/roundwood produced by local authorities, landscapers, tree surgeons and forestry services. It excludes green material, i.e. leafy material and grass cuttings, which have little value for biomass. The figures used in tables 1-3 are derived from p34 of the report and Appendix 9.

Note that "landscaping" which appeared as a separate category in the first WFTF Report has been removed.

7. Revised downwards for subsequent periods because of poor take up. Figures based on grant aided planting rates. There has been very limited uptake of SRC grants under the Scottish Forestry Grants Scheme and this has continued under SRDP. Some areas of SRC have even been removed, in part because of the termination of Scottish Biofuels contracts.

8. Only a very small area of SRF has been planted to date. Future plantings will mature after 2021.

9. Updated figures from Remade Scotland report (2009)[16].

This revised category includes the WFTF1 "wood processing" and "similar to agricultural waste" categories as these waste streams are likely to be covered by the figures in the Remade Scotland report. WFTF1 discussed the "wood processing" and "similar to agricultural waste" categories at Para 9.2. The figures had been obtained from the AEA Report, *The Evaluation of Energy from Biowaste arising in Scotland*[17]. Definitions in the AEA report for these categories were "wood processing and production of panels and furniture, pulp, paper and cardboard" and "agriculture, horticulture, aquaculture, forestry, hunting, fishing and food preparation".

Arboricultural arisings were not covered in this report as they are not classified as waste.

[15] www.usewoodfuel.co.uk/supplying-woodfuel/sources-of-supply/other-wood-resources.asp
[16] www.remade.org.uk/reports/materials/wood.aspx
[17] www.sepa.org.uk/about_us/publications.aspx

Annex 4

Table 2: Material Already Committed to Existing Markets

Type of material	2009/11 Oven Dry (t)	2012/16 Oven Dry (t)	2017/21 Oven Dry (t)	Ref.
Hardwood - Logs	20,500	20,500	20,500	1
Softwood (incl. logs, chips and SRW)	**2,603,000**	**2,603,000**	**2,603,000**	2
Softwood Brash / Branchwood	20,000	20,000	20,000	3
Softwood Stumps/roots	0	0	0	4
Small & Neglected woods	0	0	0	
Arboricultural arisings	**120,200**	**120,200**	**120,200**	5
Short rotation coppice	**0**	**0**	**0**	
Short rotation forestry	0	0	0	
Recycled and waste wood	**306,000**	**306,000**	**306,000**	6
Total	**3,069,700**	**3,069,700**	**3,069,700**	

Table 2 Comments

1. From the Forestry Commission's Forestry Statistics 2010[18]. The data for the first period simply covers 2009, the year for which we have data. For the subsequent periods we have assumed no change in demand.

2. From Forestry Statistics 2010. Again, the data for the first period simply covers 2009, the year for which we have data and for the subsequent periods we have assumed no change in demand. Additional demand projections are set out in Table 3. Forestry Statistics estimates 5.2 million green tonnes (2.6 million odt) for softwood production in Scotland in 2009. This estimate is based on industry returns and is irrespective of the final market e.g. processing or biomass. Production includes the annual volumes of small roundwood or logs that are exported (total UK exports of softwood were 347,000 green tonnes in 2009).

3. Figures from UPM Tilhill.

4. This has been set at zero because of the very limited uptake of stump harvesting.

5. These figures are from the *Arboricultural Arisings Study* above and include material committed to traditional markets such as firewood, chipped for wood fuel, shredded for landscaping, wood manufacture and animal bedding as well as the significant volumes of brash and heavy timber which are composted.

[18] www.forestry.gov.uk/website/forestry.nsf/byunique/infd-7aql5b

6. The figure used here for recycled/waste wood is an updated version of the one provided in Table 1 and Figure 5 of the Remade Scotland report. The figures have been updated based on industry estimates of increased usage.

Annex 5

Table 3 Potentially available material additional to existing market consumption less forecast future demand

Type of material	2010/11 Oven Dry (t)	2012/16 Oven Dry (t)	2017/21 Oven Dry (t)	Ref.
Hardwood - Logs	**92,000**	**90,200**	**82,900**	
Softwood (incl. logs, chips and SRW)	**216,200**	**730,400**	**1,054,300**	
Softwood Brash / Branchwood	362,700	375,000	375,000	1
Softwood Stumps/roots	35,000	35,000	35,000	2
Small & Neglected woods	50,000	50,000	50,000	
Arboricultural arisings	**51,900**	**51,900**	**51,900**	3
Short rotation coppice	**2,400**	**2,400**	**2,400**	
Short rotation forestry	0	0	0	4
Recycled and waste wood	**296,200**	**296,200**	**296,200**	5
Total availability	**1,106,400**	**1,631,100**	**1,947,700**	
LESS forecast additional demand				
Increase in sawlog (less chip) demand	174,000	174,000	174,000	6
Increase in wood panel demand	190,000	190,000	190,000	7
Increase in pulp/paper and paperboard demand	Small increase	Small increase	Small increase	8
Additional biomass demand	170,000	260,000	260,000	9
Total wood pellet production demand	140,000	140,000	140,000	10
Net availability	**432,400**	**867,100**	**1,183,700**	

Table 3 Comments

1. Pilot operations have been undertaken to assess productivity and volumes and currently UPM Tilhill is the principal harvester of brash/branchwood.

2. As highlighted above, stump harvesting has not proved to be economically attractive to date.

3. This figures is based on the *Arboricultural Arisings Scotland*, excluding material which currently goes to existing markets or is composted. Of the estimated available material, about one third is likely to be heavy timber and two thirds brash.

4. Energy forestry trials have been established by Forestry Commission Scotland[19] and the private sector has established some pilot short rotation forestry sites.

[19] www.forestry.gov.uk/forestry/INFD-85UFMB

5. The volume of recycled/waste wood available is the theoretical maximum from the Remade Scotland report, adjusted to take account figures for increased usage provided by industry stakeholders. As discussed in the report, if the figures from the WRAP report from 2009 are used, only 24,000 odt of waste wood be available. This estimate also does not take into account the economics and practicalities of segregating additional material from the supply chain, which may in fact be used in EfW plants as part of a mixed waste stream.

6. Based on the estimate from FC Statistics 2010 that 2.9 million green tonnes of Scottish produced roundwood were consumed by UK sawmills in 2009. The Forestry Commission's Expert Group on Trade and Statistics forecast a total increase in log demand of 20% by 2011 from 2009 levels. The figure used is the increase in volume after conversion i.e. minus sawlog chips (which will be used and counted elsewhere).

7. The Wood Panel Industries Federation forecast an increase in demand for Scottish wood fibre from UK wood panel mills of around 20% by 2011 from 2009 levels.

8. Some additional volume is forecast by the pulp and paper and paperboard sector to 2011. Due to reasons of commercial confidentiality because of the small number of companies in these sectors, a figure has not been shown.

9. The *Woodfuel Demand and Usage in Scotland Report 2010*[20] estimates additional woodfuel demand of 170,000 odt in 2010. It is estimated that the Tullis Russell CHP plant which will operate from 2013 will take in around 90k odt from Scottish sources.

10. Volumes identified for 2010 in the *Woodfuel Demand and Usage in Scotland Report 2010*. The report forecast wood pellet production in 2010 to increase to 157 000 odt. From this is deducted the volume of pellets used in Scotland in 2009. This assumes that pellets used in Scotland are made from Scottish fibre. It also does not take into account any use of Scottish pellets as part of the increased biomass demand (para 9). As pellet consumption increases in Scotland, care will have to be taken not to double count wood pellet production and consumption.

[20] www.forestry.gov.uk/forestry/infd-7tdhjn#woodfuelusage