FORESTRY
THE INDUSTRY – A BRIEF DESCRIPTION
It is important to recognise that UK forestry is a regulated sector and that the overall amount of timber harvested from UK forests each year is less than the amount of annual growth. The amount of timber which is added to the forest resource (or growing stock) each year is known as the ‘annual increment’. By harvesting less than or equal to the annual increment, a sustainable cut and long-term balance is achieved. It is possible to increase the sustainable cut by expanding the area of forests or by planting faster growing species. The area of woodland in the north east is increasing at the rate of about 100 hectares per year. (The GB figure is about 12,000 hectares per year).
Currently 12% of the region is forested, making it one of the most afforested regions in England. It contains about 10% of England’s total forest cover – over 100,000 hectares in total - about half of which is privately owned and half in state ownership or management.

TIMBER MARKETS
Decisions about when to undertake harvesting in a forest are based upon the value of the timber and wind firmness, which is influenced by the tree species present, their age and the location. The value of trees of a given species, size and in a given location is heavily influenced by the state of the market. The market is thus an important determinant of what is harvested, when and where.
Management of these woodlands, with operations such as thinning, helps maintain both the quality of the product and the value of the woodland for wildlife. However, it is often difficult for owners to afford to undertake management operations such as thinning unless the market for the small diameter material produced is strong. The growth in demand for wood as a fuel source will have a beneficial effect on wood price so stimulate desirable woodland management activity.

AVAILABILITY OF FORESTRY WOOD
About 550,000 tonnes of wood is harvested in the north east of England each year and production forecasts indicate that this figure is stable going forward. Of this total, about 300,000 green tonnes is small diameter timber, the vast majority of which is currently sold for pulp or particleboard manufacture. This materially could be used as woodfuel but this would have a damaging effect on well-established wood processing businesses. The Woodfuel Strategy for England indicated that there is the potential to produce an additional 2 million green tonnes of wood each year by 2020 from existing, largely undermanaged woodlands. This is volume in addition to that accounted for in the current production forecasts and required by the existing wood processing industries. The Forestry Commission estimates that by 2020 an additional 100,000 tonnes of wood could be produced on a sustainable basis from woods and forests in north east England, and about half of this may be of a suitable size and value for woodfuel.

In addition to this, other wood could be made available as wood fuel from the tops of trees (under 7cm diameter often called “brash”) which is normally left on the forest floor after harvesting. However the brush does play an important part in protecting the soil during harvesting and also contains nutrient which would normally return to the soil, therefore only a proportion of this potentially available resource could be taken.

<table>
<thead>
<tr>
<th>FORESTRY TIMBER</th>
<th>550,000 tonnes at 30% moisture content</th>
<th>1.7 billion kwh of heat</th>
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</thead>
<tbody>
<tr>
<td>Co-products from the wood industry</td>
<td>170,000 tonnes at 50% moisture content</td>
<td>382 million kwh of heat</td>
</tr>
<tr>
<td>Wood Waste</td>
<td>80,000 tonnes at 20% moisture content</td>
<td>320 million kwh of heat</td>
</tr>
<tr>
<td>Energy coppice</td>
<td>4,300 tonnes at 30% moisture content</td>
<td>15 million kwh of heat</td>
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</tbody>
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The different moisture contents reflect the likely moisture content of that product when sold for fuel. The kwh figure takes into account an average efficiency of boilers.

MARKETS AND PRICES
The cost of heating with wood is between 1.5 p/kwh and 2.5 p/kwh with wood chips depending on quantity and quality. This compares to the current costs of heating with oil at about 4 p/kwh, making wood a highly competitive source of fuel that also has the potential to encourage more active and sustainable management of the region’s woods and forests.
The north east of England has one of the largest wood resources in England, with over half a million tonnes cut annually for a range of markets in the region and beyond. This resource equates to a heating capability of about 1.2 Terawatt hours (1,200,000,000,000 watt hours), or enough energy to run 137,000 one bar electric fires day and night for a year. However, virtually all of this wood goes into other uses at the present time, such as timber for house building and for making chipboard, so the wood fuel market will have to compete for a portion of the resource.

However, there are many woods in the north east that could produce, on a sustainable basis, much more wood than they do. The Forestry Commission estimate that by 2020 an additional 100,000 tonnes of wood could be produced on a sustainable basis from woods and forests in north east England and about half of this may be suitable for woodfuel. In addition, large volumes of post consumer wood that currently goes to landfill could also be used for energy production.

WHAT IS WOOD ENERGY?

Woodfuel is a subset of the broader class of fuels known as biomass - energy sources from organic matter. Biomass now provides 7% of Europe’s total energy needs, with approximately 80% of this from wood; this equates to 5.6% of Europe’s energy obtained from wood. In total, some 100 million green tonnes a year of wood are used for energy in Europe. The vast majority of this wood is processed into chips and then burnt to provide heat.

The pie chart below shows the proportions of renewable energy used across the European Union. The bar chart shows the percentage share of biomass in a range of European heat markets. These statistics on market share establish that wood energy is a large and established business – with a greater market share than all the other renewable energy technologies combined. This suggests that the prospects for market growth in the Region are excellent if the market simply becomes more aligned to the EU norm.

SOURCES OF WOOD FUEL

There are four possible sources of wood fuel.

- Sawmill co-products
- Post consumer wood waste
- Purpose grown energy crops
- Forestry

SAWMILL CO-PRODUCTS

As part of the sawmilling process, wood chips, dust, shavings and bark are produced in large quantities. The north east has England’s second and third largest sawmills, with a combined output of 170,000 tonnes of co-products. This equates to over 300 million kilowatt hours of heat. However as this is a high moisture content wood chip (around 50%) it is only suitable for use in boilers designed to use this kind of fuel.

At present, almost all of this co-product is processed into particle board in local mills and is not used for heat. Sawmill co-products are likely to remain an essential raw material for the particle board industry, facilities such as Egger’s Hexham plant, in the future. Whilst there is undoubtedly scope for directing some of this material to the wood heat market it is likely that loss of this material could threaten the viability of the particle board industry. It is therefore a priority to secure woodfuel from new sources rather relying on substitution from existing timber markets. As a result areas such as post consumer wood, purpose grown energy crops and timber from currently undermanaged woodlands offer the best opportunities for growing the wood fuel market.

POST-CONSUMER WOOD

Post-consumer wood refers to the wood produced by timber recycling companies from recycled and waste timber and also from tree surgery work.

There are several types of product available from this stream: very dry recycled wood – between 5-20% moisture content; from untreated packaging and pallets; seasoned reclaimed wood from tree surgery work - with a moisture content of 25-35% which can be used in most types of boiler; and fresh reclaimed wood from tree surgery work with a moisture content of around 50%, which would be suitable for boilers specifically designed for this purpose.

Studies in the region suggest an annual quantity of about 20,000 tonnes of tree surgery arisings and 60,000 tonnes of packaging and pallets, which has the heat equivalent of about 280 million kilowatt hours. At present this is going into waste streams and ending up in landfill or is being composted. About 80,000 tonnes each year is being used by the large scale biomass power generation plant at Sembcorp’s Wilton 10 power station on Teesside but much of this is sourced from outside the region.

PURPOSE GROWN ENERGY CROPS

Purpose grown energy crops are usually fast growing willow trees planted on agricultural land and harvested every 3 to 5 years. At present there are about 200 hectares planted in the region and probably another 100 hectares soon to be planted, which would produce about 1,000 tonnes a year. This has the heat equivalent of 15.5 million kilowatt hours. This source of wood chip is not freely available in the region as the small amount that is grown is contracted to Sembcorp’s Wilton 10 power station.