

SUPPLEMENTARY WRITTEN EVIDENCE FROM SCOTTISH COAL

Fuel Supply Arrangements for Scottish BioPower (SBP) Biomass Plant at Tullis Russell, Glenrothes

1. Introduction

- 1.1 This note describes the proposed fuel supply arrangements for SBP's biomass generating plant at the Tullis Russell site at Glenrothes. It is in response to a request for such a briefing from The Scottish Parliament Environment and Rural Development Committee. It describes all the different biomass supplies which are being developed, and then focuses particularly on energy crop and the barriers to its development.
- 1.2 A number of companies are involved. Mining (Scotland) Limited (M(S)L) is the holding company for the Scottish Coal Company Limited (SCCL), and for Scottish Biofuel (SBF). SBP is a company related to the M(S)L Group. SBF is a fuel supplier to SBP.

2. Background to biomass generation, SCCL and Scottish BioPower

- 2.1 The use of biomass for electricity and heat generation is CO₂ neutral and will contribute to the Scottish Executive's renewable energy targets and creates diversity in the renewable generating capacity. Unlike wind, biomass is a base load generation mechanism, thus each unit of installed capacity of biomass is equal to 3 or 4 times the output of a same-sized wind farm, and creates grid stability without any need for balancing capacity elsewhere.
- 2.2 Wood biomass from forests will boost the forestry sector, and energy crops sustain Scotland's challenged agricultural sector.
- 2.3 SCCL is developing wood biomass fuel supplies for the co-firing market. The needs of existing generator's coal designed plants are for a dry fuel, typically wood pellets. Pellets can be derived from both forestry and energy crop sources.
- 2.4 SBP is developing purpose-built biomass fuelled power stations in Scotland. These can take normal wood chip without the processing costs involved with wood pellets, but there are high capital costs in constructing such new generating plant.
- 2.5 Three plants are currently under consideration by SBP:-
- a CHP plant generating 50MW electrical plus steam for the Tullis Russell paper mill at Glenrothes
 - 250 MW electricity-only plants at Chapelcross and Killoch (Ayrshire). These last 2 are about half way to Section 36 applications and in mid April 2006 are expected to be offered grid connections, but the connections may be as late as 2014/16. Further work on these plants therefore awaits the grid offer in April.

- 2.6 The Glenrothes plant is much more advanced. It is to be built on the existing Tullis Russell paper mill site and will meet Tullis Russell's need to replace its existing coal fired boilers which are under SEPA emissions prohibition and which must close by the end of 2009. Tullis Russell's existing 540 jobs are therefore under threat unless economic and stable sources of steam and electricity can be created (Tullis Russell have recently experienced severe gas price fluctuation where the daily costs have increased from £6,000 a day to in excess of £50,000 a day; this is an unsustainable position, hence the need to make investment decisions to reduce risk and maintain stability). Conventional generation or purchases from the grid are uneconomic.
- 2.7 The new biomass plant will generate the steam (circa 25MWe equivalent) and electricity (circa 20MWe) needs of Tullis Russell, and export the balance of electricity (circa 30MWe) to the grid. The plant has planning permission and a firm grid connection offer for August 2008. It will be the largest such plant in the UK (though much bigger plants are common in Europe and Scandinavia). Government capital grant is being pursued and bank financing will begin in March/April 2006. Construction contracts are already progressing. Its fuel supplies are well advanced and are set out below.

3. Biomass Supplies in Scotland

3.1 Introduction

- 3.1.1 Wood fuel biomass supplies in Scotland are constrained by immature supply chains. Current supply and demand is balanced based on existing forestry production and existing consumers such as saw mills, board and paper mills. Committing to long term contracts (beyond 1 year) is unusual, changes to forestry production are long lead time, and owners are used to leaving the asset to grow for several more years if short term prices are unattractive or unprofitable.
- 3.1.2 However, there is potential for significant expansion. In the next few years there is a predicted increase in output from a surge in forests reaching maturity, but much of this is of low quality unsuited to existing timber uses, but ideal for the biomass sector. In addition, new forestry techniques, well established on the continent, can extract additional tops, brash and residues of the trees, not currently harvested in the UK. Finally, energy crop can add completely new sources of biomass, close to market and in challenged rural areas.
- 3.1.3 Existing board and paper mill prices are very close to the maximum possible £/GJ for economic operation of biomass plants, even with the current ROC regime. It is not therefore possible for biomass generators to overtly compete and divert existing supplies from existing flows, as this would simply spiral prices up to unaffordable levels. Additional volumes have to be nurtured without increasing market price, but this implies a relatively slow expansion of available supplies from forestry and the co-product markets, and the need to use imports until the indigenous market develops, and encourage energy crop to create an additional source that does not compete with existing markets.
- 3.1.4 SBP has achieved this by investigating and pioneering many alternate fuel supplies over the last 12 months. Through this, SBP has secured access to circa 1,000,000 wet tonnes of fuel for the Glenrothes plant and the co-firing market.

3.1.5 The moisture content of each fuel source is critical to both tonnage and price. Put simply the drier the fuel, the more valuable it is to the plant, and the less the quantity required.

3.1.6 At current view on the probable average moisture content, the Glenrothes plant requires circa 600,000 wet tonnes each year. The fuel streams are set out below. In each fuel stream, SBP has identified a leading player as partner, based on a combination of current size, innovation, bankability and appetite for the biomass fuel market.

3.2 Private Sector Forestry Supplies

3.2.1 SBP has an agreement with a leading Scottish forestry management Company to:-

- supply 75-100,000 tonnes pa of “conventional” forestry supplies;
- developing “unconventional” sources (i.e. tops and brash, residues, whole tree harvesting);
- forestry ownership investment by UK and overseas investor clients;
- energy crop farm investment.

3.2.2 Conventional forestry can expand its output through the bow wave of forests reaching maturity following extensive planting in the 1960-70s. Much of this is low quality and unsuited to current markets and is simply being left standing in the hope that sale prices will improve to the point that harvesting becomes economic. This makes it attractive for the biomass sector.

3.2.3 “Unconventional” materials are the forest residues, brash and tops. These are exploited in other countries - for example the entire growth of biomass energy in Finland in the next few years, to 15M cubic meters per annum, will come from residue extraction. In Scotland the material is simply left in the forest and there is a conservative view of volumes available for extraction but our partners are using contacts in Finland and Denmark (who are already harvesting circa 1M tonnes pa of these materials) to establish harvesting methodologies and machinery for Scotland.

3.2.4 Whole tree harvesting and chipping processes can significantly reduce the costs of harvesting and increase the yield content for biomass energy usage. Whole tree harvesting is widely used in the US, Canada and Scandinavia, but not yet in the UK. SBP is exploring this opportunity.

3.3 Forestry Commission supplies

3.3.1 The Scottish Executive and the Forestry Commission have recently agreed to offer via a tender 100,000 tonnes targeted at the biomass for energy market. This is a major change for the Forestry Commission and is the first time that material has been aimed at the biomass market. SBP is responding to the tender.

3.3.2 The Forestry Commission has also committed to negotiate exclusively with SBP for 40,000 tonnes of brash. This will be negotiation as they do not currently extract or sell brash to any other customers. The initial quantity will be used in part to prove FC’s brash and residue extraction, and is likely to increase over time.

3.4 Saw mill co product

- 3.4.1 50% of timber taken into saw mills emerges as shavings, turnings, saw dust and other co-products. These currently go to existing board mill and other markets though some will soon be supplied to the E.ON Lockerbie plant. SBP is in negotiations for some supplies to Glenrothes, which will enable saw mills to expand activity which is currently constrained by inability to sell additional co-product volumes.

3.5 Recycled wood

- 3.5.1 Recycled wood is available in a variety of grades and classifications. SBP intend to use some clean recycled wood, but excluding all hazardous waste such as creosoted material. Recycled material is expected to be in increasing supply as landfill directives and local authority recycling targets constrain current disposal routes. It is relatively low moisture content and low price.

3.6 Imports

- 3.6.1 The difficulty of ramping up supplies of forestry materials, and the relatively long lead time for energy crop, means that imports are required to underwrite the fuel supplies. The intent is to import wood chips into the port of Rosyth.

4. Short Rotation Coppice willow

- 4.1 SCCL has led the development of willow SRC in Scotland through SBF. It has 60ha planted over the last 4 years which has proved SRC's suitability to Scottish climate, tested alternate provenance species, established seed stock supplies and proved suitable planting techniques.
- 4.2 After initial planting, the first crops are available after about 3 years, with natural regrowth (without replanting) every 3 years over a 20-25 year life. Ongoing husbandry is minimal once the initial site preparation, fertilizing, planting and first year establishment has been completed. Management of the fuel supply is easier than forestry products and economically SRC has the strong prospect of producing a lower £/GJ fuel feedstock.
- 4.3 Increasing proportions of energy crop is a requirement of the co-firing ROC regime. As a result, all UK co-firing generators are seeking large quantities, well in excess of current available indigenous supplies. However the co-firing incentives cease in 2016, which makes long term economics difficult. Extension beyond 2016 is needed to encourage more UK and Scottish planting.
- 4.4 The plans for Glenrothes are to plant SRC within 50 miles to try to produce up to 200,000 tonnes per annum. This implies about 13,000ha (based on modest yields). Any surplus can be diverted to the co-firing market.
- 4.5 Under the new Single Farm payment regime and with the Forestry Commission raising the planting grant from £600 to £1,000/ha, the farmer's economics are moderately strong compared to existing crops. The farmer's economics are shown in Appendix 1.

- 4.6 Despite this, there is a slow uptake of energy crops and reluctance from farmers to be the first to try such a new crop and commit to long-term contracts. In August and October 2005, SBP ran a marketing campaign through the Scottish NFU. Despite over 100 expressions of interest from local farmers and briefings from experts in its planting, there have been few seriously interested in 2006 planting, and only a handful of contracts have been signed for 2006 planting.
- 4.7 The current Forestry Commission uncertainty over the planting grants for 2007 will destroy the potential and must be resolved quickly. If Scotland is to establish energy crop, the planting grants must be clarified.
- 4.8 SBF is also undertaking trials with the Scottish Agricultural College on Miscanthus grass, but these are too early to include in any fuel supply modeling.

5. Definition of and Responsibility for Energy Crops

- 5.1 As indicated above, the current rules on eligibility for renewable obligation certificates impose a cut-off date, 2016, after which co-firing with biomass attracts no certificates, and a requirement that an increasing percentage of the biomass is derived from energy crops. The FREDS report on “Promoting and Accelerating the Market Penetration of Biomass Technology in Scotland” recommended that “the Scottish Executive should consult on amending the definition of energy crops in the Renewables Obligation (Scotland) Order 2004 to include material derived from any sustainably managed woodland, i.e. woodland certified to the UK Woodland Assurance Standard”.
- 5.2 In our view, amending the definition in this way would have a very detrimental effect upon the development of a wider biomass to energy market in Scotland. As the IPA/SAC report for the Executive (An Analysis into a Proposal for an Amendment to the Renewables Obligation Definition of Energy Crops) noted,

“1.4.1 The greater density of woodland products in Scotland and lower density of land suitable for energy crop cultivation would be expected to make competition between the fuel crops more intense in Scotland than in other parts of the UK. Thus, a change in the ROS to allow woodland products to be categorised as energy crops, could significantly limit the development of their energy crops for co-firing in Scotland.”

Shorter rotation energy crops are needed to enlarge the total biomass availability and to maintain the sustainability of biomass as an energy source. In the short term, the impact of allowing forestry products to meet the energy crop requirements would be that no short rotation energy crops would be planted for co-firing at Cockenzie and Longannet. In the medium to long term, ROC-supported prices for co-fired forestry biomass would undermine the viability of dedicated biomass energy plants, and the viability of a promising diversification option for Scotland’s farmers, with considerable potential to contribute to sustainable rural development.

- 5.3 Consistent with this view, we believe that the location within Government of lead responsibility for energy crops needs to be reconsidered. The Forestry Commission Scotland, where responsibility currently lies, has been showing welcome signs of greater commitment to the development of energy crops in Scotland, but if real progress is to be made then we need to see much greater commitment. If the Commission’s championing role for forestry, and direct involvement in forestry production, makes it difficult to deal with the tensions that would produce, then

considerations should be given to shifting responsibility to the Executive, either that part responsible for the Agriculture Strategy, or for Renewable Energy Policy generally.

Mining (Scotland) Limited
7th March 2006

Farmers' Information Sheet for Willow Planting 2006 Season

Following the announcement for the Forestry Commission relating to the increase in grant levels for energy crops to £1,000 per hectare (matches that available to English Farmers), Scottish BioFuel can now demonstrate to farmers and landowners the anticipated benefits from the growing of energy crops under contract to Scottish BioFuel.

Scottish BioFuel Proposals

Scottish BioFuel will assess in the first instance, your lands suitability to grow Short Rotation Coppice (SRC) in the form of willow as an energy crop. Once your suitable land is identified and you wish to proceed with planting, we will help you submit the applications for planting grants to the Forestry Commission.



The contract with farmers/landowners is for an initial 10 year period with options for 5 and 10 year extensions to this contract.

Planting operations take place between March and the end of May and the provision of all planting material and the planting with specialist equipment will be undertaken by Scottish BioFuel or its approved agents. This is to ensure that a good quality planting operation is carried out to give

maximum returns to farmers at harvesting.

The grant payment will be made to Scottish BioFuel for carrying out all planting operations and the first year's insecticide treatments if required. All additional costs associated with the planting operation are met by Scottish BioFuel.

The farmer/landowner is responsible for the preparation of the field for planting. This operation is as for traditional crops. The farmer will be responsible for good plant husbandry and a cost is included in our estimations for expert assistance to farmers from SRC approved specialists at £15 per hectare.

Once the crop is matured ready for harvest, Scottish BioFuel will purchase the standing crop and carry out all harvesting operations of the willow. The willow is purchased at a price related to its moisture content as shown below. It is therefore beneficial to the farmer to allow short term storage of the harvested material to allow natural drying of the crop thus enhancing the profit achieved. The harvesting process will occur at approximately 3 year intervals.



Current crops are producing on average 90 wet tonnes every 3rd year (moisture at 50%)

Additional Info

Crop Comparisons

| Arable Crop Comparisons | First | Second | Winter | Winter | Arable | |
|---|--------------|---------------|---------------|---------------|------------------|-------------|
| vs SRC Cropping | Wheat | Wheat | Barley | OSR | Rotation* | SRC |
| Grain Yield | 9 | 7.5 | 7.25 | 3.75 | | 15.38 |
| Price | 70 | 70 | 67 | 145 | | £8.37 |
| Straw Value | 15 | 15 | 25 | 0 | | |
| Energy Crop Supplement | | | | | | 30 |
| Establishment Grants | | | | | | |
| Output | 645 | 540 | 511 | 544 | | 159 |
| Variable Costs | 245 | 275 | 200 | 235 | | 22 |
| Gross Margin | 400 | 265 | 311 | 309 | | |
| Labour | 160 | 160 | 160 | 160 | | |
| Power & Machiney | 180 | 180 | 180 | 180 | | |
| Other Farm Business Overheads | 85 | 85 | 85 | 85 | | |
| Profit before rent & finance | -£6 | -£160 | -£114 | -£116 | -£99 | £137 |

NOTES

NO Single Payment included in any figures

Energy crop supplement of up to 45 euro (£30)/Ha not applicable for crops on setaside

Other farm overhead reduced for SRC cropping

All figures on a per Ha basis

* Arable Rotation, W OSR, 1st W Wheat, 2nd W Wheat, W Barley

Notes

Seedbed Preparation - Glyphosate, Subsoil (50%), Plough, Power Harrow, Roll x2

Operation costs from Nix at average "farmers" cost

Glyphosate (4lt) Inc application £15

Subsoiling £34/ha

Ploughing £40/Ha

Power Harrowing £24/Ha

Rolling £11/Ha