

## Woody biomass

**Snapshot:** In 2010 2.8% of Scotland's forecast non-electrical heat demand in 2020 was being met by renewables and 83% of renewable heat capacity, and 91% of renewable heat output, came from installations which used biomass primary combustion or biomass combined heat and power. Biomass plants installed at locations throughout Scotland currently make up around 86% of total renewable heat capacity, with three sites providing over 50% between them. This is currently 1.4% of total heat demand. Supply chains are now operational across Scotland at a range of scales. Woody biomass is identified in the Renewable Heat Action Plan as a key technology in delivering a significant proportion of the 11% heat target by 2020. The Renewable Heat Incentive is driving further woody biomass schemes, and the development of local heat markets using local resources.

The Scottish Government has set out its policy on biomass in [National Planning Framework 2](#), in its [Section 36 Thermal Guidance](#) and [Section 36 Biomass Scoping Opinion](#) guidance. In summary the Scottish Government would prefer to see biomass deployed in heat-only or combined heat and power schemes, off gas-grid, at a scale appropriate to make best use of both the available heat, and of local supply. Further detail, including the rationale for this policy is also set out in the [Draft Electricity Generation Policy Statement](#).

It is likely that planning authorities will be dealing with an increasing range and number of woody biomass applications, in response to incentives, and given its significant potential to deliver on renewable heat targets and to provide local economic and fuel security benefits. In the face of difficulties associated with obtaining adequate woodfuel, applications should be supported by a clear plan for securing woodfuel supplies in the long term that minimise adverse land use, landscape and transport implications, both domestically and overseas.

Planning authorities will be expected to support district heating schemes, which would offer greater savings and benefits in comparison to individual buildings, albeit recognising that there will be practical implementation challenges.

### **Suggested areas of focus for planning authorities:**

- Develop strategy within local area for woody biomass relative to predicted woodfuel supplies, considering choices between larger centralised wood biomass operations and/or smaller scale decentralised operations;
- Provide greater clarity on where wood biomass plants can be located and the type of schemes that are appropriate;
- Use heat mapping models to link woodfuel supply to areas of heat demand;
- Detail criteria to be applied in assessing woody biomass applications
- Consider the source and transportation of woodfuel;
- Take into account the scale and location of developments and source of woodfuel within the environmental assessment of the plan.
- Establish a protocol for involving key consultees in spatial planning, policy making, pre-application work and applications for wood biomass operations;
- Provide guidance on typical information needs for pre-application discussions;
- Ensure planning conditions and agreements are reasonable and proportionate
- Engage local communities, biomass operators, woodfuel suppliers and other stakeholder in taking forward approach.

## Opportunities within Planning Processes

Stage in Planning Process	Actions for Wood Biomass
<p>Monitoring and Evidence Base and Main Issues Report</p> <p><i>The National Forest Inventory (NFI) is a GIS data layer which confirms the type and geographic extent of all woodland in Scotland. It is owned, maintained and supplied by Forestry Commission Scotland (FCS). There are environmental, biological, economic and logistical constraints on what can actually be harvested. FCS's <a href="#">softwood production forecast</a> (due to be updated in summer 2012) provides figures for potentially harvestable volumes and regional information can be provided on request.</i></p>	<ul style="list-style-type: none"> <li>• Consult FCS to help predict potential woodfuel supply projections in area</li> <li>• Establish if there are up to date map based records of operational and consented woody biomass schemes in the area               <ul style="list-style-type: none"> <li>○ Consider if existing spatial frameworks and policies for woody biomass are fit for purpose. Determine if they:</li> <li>○ Identify woodfuel sources, areas of high heat demand, infrastructure and potential sites for wood biomass plants</li> <li>○ Cover the full range of scales and types of biomass technologies proactively respond to current national targets for renewable heat and recognise potential local growth resulting from the Renewable Heat Incentive</li> <li>○ Consider localised and off-site impacts</li> </ul> </li> <li>• For Strategic Development Plan (SDP) Authorities, consider if managing woodfuel raw materials within the SDP area requires a strategic response</li> <li>• Involve key consultees for biomass (including Scottish Natural Heritage (SNH), Scottish Environment Protection Agency (SEPA), FCS) and others such as The Royal Society for the Protection of Birds (RSPB), Woodland Trust and Community Woodland Association ideally at draft Main Issues Report stage</li> </ul>
<p>Spatial Planning</p> <p>Guidance on preparing heat maps is available at :</p> <p><a href="#">Planning for Renewable and Low Carbon Energy – A Toolkit for Planners July 2010</a></p> <p><a href="#">Energy Savings Trust website</a> and <a href="#">“Sustainable Energy in the Built environment – Best Practice for Scottish Planners”</a>.</p>	<ul style="list-style-type: none"> <li>• Consider if sufficient data is available to inform heat planning for the area. This should comprise:-               <ul style="list-style-type: none"> <li>○ Data on raw materials                   <ul style="list-style-type: none"> <li>▪ Volume of woodfuel that could potentially be harvested (recognising that much of woodland on National Forest Estate may already be committed or may not be harvested at all)</li> <li>▪ Timing of harvesting (likely to depend on whether it is a by-product of the construction timber market or produced specifically for biomass, and whether it requires seasonal felling and drying)</li> <li>▪ New planting and managing woodland for biomass (Does the authority have an indicative forest strategy? What is the available rural land area taking account of competing uses and designations?)</li> </ul> </li> <li>○ Current heat demand in the area (noting areas of high heat density, off gas grid, public sector buildings with high heat loads, building type and energy efficiency of existing buildings)</li> </ul> </li> </ul>

<p><a href="#"><u>The Right Tree in the Right Place: Planning for Forestry and Woodlands.</u></a> and there is a <a href="#"><u>range of additional guidance</u></a> available.</p> <p><a href="#"><u>Good practice cases studies</u></a> on Scottish Government (SG) website</p> <p><i>Highland Council, with SG and Highlands &amp; Islands Enterprise, have developed a heat map model, full details of which are available on <a href="#"><u>Highland Council website</u></a>.</i></p> <p><i>Highland Birchwoods model for heat (excluding industrial process heat) run for Highland, Moray and Western Isles</i></p>	<ul style="list-style-type: none"> <li>○ Infrastructure to service biomass (e.g. sawmills, existing processing plants, recycling plants that can take ‘clean wood’ otherwise destined for landfill, transport infrastructure)</li> <li>○ The location, number, scale and type of approved &amp; consented biomass schemes see <a href="#"><u>Ofgem renewables and CHP register</u></a></li> <li>○ Areas of fuel poverty (allowing a targeting of resources)</li> </ul> <ul style="list-style-type: none"> <li>● Ensure that the above spatial data is used to progressively build up layers of a GIS based ‘heat ‘opportunities’ map’ which identifies where there is the greatest potential for woody biomass, both in terms of single operations and heat networks</li> <li>● Ensure full consultations have been carried out with key consultees such as FCS and SNH to determine impacts on designated sites, ecological and recreational sensitivities.</li> <li>● Consider choices within local area, based on raw material capacity, on scope to have large scale centralised operations and/or smaller scale decentralised operations</li> <li>● Assess whether spatial plans provide sufficient clarity to suggest areas of search where the technologies can operate the most efficiently with the greatest benefits within environmental constraints.</li> <li>● Planning authorities ought to be able to use the monitoring and evidence base to allocate sites within development plans</li> <li>● Strategic Development Planning Authorities (SDPAs) are well positioned to consider the regional and cross-boundary issues and opportunities.</li> </ul>
<p>Drafting Development Plan Policy</p> <p><i>The FCS hold a <a href="#"><u>list of woodfuel suppliers in Scotland</u></a> and facilitate several regional woodfuel forums across Scotland to promote coordination and networking in the biomass sector. Supplying such details, along with that of local forestry and recycling networks, may help a potential wood biomass operator to enhance the benefits of their scheme.</i></p>	<ul style="list-style-type: none"> <li>● Ensure that woody biomass policies: <ul style="list-style-type: none"> <li>○ Recognise Scottish Government policy to support heat only and CHP off the gas grid of an appropriate size to the local resource</li> <li>○ Cover potential range of scales and types of woody biomass operations within the particular planning authority area and provide design guidance to manage impacts and to promote efficiency</li> <li>○ Consider the impacts from harvesting and transporting woodfuel as well as the localised impacts of biomass plants</li> <li>○ Consider the benefits of decentralised heat supply in countering fuel poverty</li> </ul> </li> <li>● For Strategic Development Plan Authorities, ensure strategic guidance is provided on the use of raw materials and the cumulative impact of schemes within the constituent areas</li> <li>● Consult key consultees for wood biomass at an early stage of drafting of woody biomass policies</li> </ul>

Development Plans Action Programmes	<ul style="list-style-type: none"> <li>• Consider selecting an action officer to take forward development plan objectives for woody biomass. Typically this might involve sharing resources on relevant working groups with FCS and SNH to secure clearer information on woodfuel supply, to decide on focus and priorities, to prepare local guidance and to take forward site allocations in development plans</li> </ul>
Strategic Environmental Assessment (SEA) of Spatial Guidance and Development Plan Policy	<ul style="list-style-type: none"> <li>• For woody biomass there are likely to be particular challenges and considerations with determining the impact of using different wood fuel sources, most notably in terms of land use and landscape character implications and transportation impacts, and depending on whether raw materials are sourced locally or from elsewhere (including overseas markets).</li> </ul>
Securing Sufficient Information to Determine Planning Applications	<ul style="list-style-type: none"> <li>• Establish if supporting guidance adequately details typical information needs for pre-application discussion and planning applications</li> <li>• Operators should be encouraged to show that they have taken account of the supply of woodfuel over the life of the project. If they have not, it is possible that the environmental benefits would be outweighed by negative transport emissions impacts. Woodfuel supplied in the UK (See below) would normally be expected to be from sustainable local sources.</li> <li>• Ensure that information needs are proportionate</li> <li>• Ensure that design statements are submitted for national and major wood biomass proposals over 20 Megawatts (MW)</li> </ul>
Pre-Application Stage	<ul style="list-style-type: none"> <li>• Ensure that key consultees for considering woody biomass proposals are given adequate opportunity to be involved in pre-application meetings / site visits,</li> <li>• Ensure that early advice is given on whether schemes require an Environmental Impact Assessment (EIA)</li> </ul>
Determining Planning Applications	<ul style="list-style-type: none"> <li>• Involve key consultees in site visits / meetings to help ensure that constraints are overcome where possible.</li> <li>• If woody biomass proposals on key public buildings would stimulate the woodfuel supply market in the local area or if proposals would relieve high fuel poverty or off gas grid problems, then highlight this as a material consideration in the planning assessment;</li> <li>• Technical information and guidance on typical issues associated with wood biomass are provided below which local planning authorities should draw upon in determining applications and designing appropriate local solutions.</li> <li>• Consider cumulative impacts and decommissioning.</li> </ul>

## Technical information for Woody Biomass

*Raw Materials:* There is a range of woody biomass renewable material that can be converted into electricity and heat using a variety of processes and technologies. This includes wood from existing forestry, new plantings (short rotation coppicing of willow or poplar or maize production); short rotation forestry (typically fast growing poplar or willow or eucalyptus); arboricultural arisings; co-products from timber processing. (e.g. residues such as "brash", the material left over from conventional timber extraction and tree thinning); and clean recycled and waste wood. Wood is mainly supplied as logs, wood chips, pellets or briquettes. Wood pellets are made by compressing sawdust and are used both on large scale operations and domestic scenarios. Wood chips can be used from very large to small-scale operations, though are unlikely to be suitable for domestic application. Logs and briquettes are most appropriate at the microgeneration scale.

*Energy Recovery / Heat Production:* Combustible fuels, such as those from forestry, can be burned (combusted) to produce heat and/or power. Woodfuel burners range in size and technical sophistication from small domestic units to large power stations. They can produce heat or generate electricity, and they can be used in combined heat and power plants. Chip or pellet size and moisture content must match the requirements of the burner system.

*Potential Benefits of Using Woody Biomass:* Biomass derived energy or heat can provide economic benefits and relieve fuel poverty in areas and can result in improved woodland management. Woody biomass operations can offer possibilities for combined heat and power (CHP), offer a reliable low-cost heat source for industrial or commercial use (such as a district heating system for a small community), together with electricity, that can be sold to the local grid.

*Potential Negative Effects From Using Woody Biomass:* Forest management and harvesting in Scotland must comply with the UK Forestry Standard and associated guidelines. The Scottish Government is working with the UK Government to introduce sustainability criteria for biomass plants. (see below) However, consideration should be given to the sustainability of imported raw materials; where plantations can result in a change in landscape character / way of life, where a single large scale biomass plant uses up the raw materials for smaller scale operations locally; where large wood chip piles are not contained properly or resultant liquids leach into watercourses.

Whilst the Scottish Government is not categorically opposed to large scale development, it is likely that the larger the proposed scale, the more difficult it will be for the developer to utilise the heat generated and to source supply locally. Hence any development should be scaled appropriately to make efficient use of the available heat and local supply. Large scale developments which do not maximise heat use may also displace supply from our priority of delivering our heat target.

The Renewables Obligation (Scotland) Amendment Order 2011 introduced a requirement for all generators above 50 KWe to report against greenhouse gas and land use sustainability criteria from April 2011. This includes a minimum Greenhouse Gas (GHG) emissions reduction level, set at 60%, and restricts biomass use from land with high carbon stocks, high biodiversity and peatland. This minimises any potential negative impacts.

## Typical Considerations in Determining Planning Applications for Woody Biomass

*Considering Woodfuel Source:* Planning authorities should give some consideration to the source and security of supply of woodfuel. Woodfuel from sustainably managed forests provides a renewable source of energy. Managing forests for woodfuel can also benefit a wide range of other forest functions such as biodiversity, recreation, landscape and carbon sequestration. In the UK, areas that are harvested are usually replanted as a condition of felling licences. There are also potential sources of arboricultural residues from street and park trees and clean wood waste from sawmills and joinery workshops, which minimise waste and associated negative environmental impacts. Imported raw materials tend to have lower carbon emission reduction benefits than locally sourced biomass.

*Location of Woody Biomass Plant:* Heat mapping exercises should result in a clear steer for applicants and planners should take account of this, including where the best locations for district heating and heat networks might exist.

*Physical Aspects of Woody Biomass Plant:* There will typically be a range of other planning considerations to be taken into account including the design of plant and machinery, including chimney height, provision for storage, vehicular access and vehicular movements, air quality, noise, odour, boundary treatment and lighting.

- *Air Quality:* The Scottish Government has set out the [policy position on biomass and air quality](#). Air quality is an issue which will need to be assessed by Planning Authorities, especially where developments are proposed within Air Quality Management Areas. Planning Authorities should be aware of the [revised Air Quality Strategy for England, Scotland, Wales & Northern Ireland](#), July 2007, as well as [Scottish Government Local Air Quality Management Guidance](#). Chapter 11 relates specifically to air quality and biomass.
- *Defence Considerations:* Structures associated with woody biomass plants, have the potential to be a physical safeguarding issue to the Ministry of Defence (MOD) as these structures could penetrate the safeguarded surfaces associated with defence radars / technical equipment and aerodromes. Planning authorities should refer to statutory safeguarded maps and consult MOD.

### Useful References:

Information on woody biomass in Scotland, including a list of woodfuel suppliers, case studies and contacts, is available through the [Usewoodfuel website](#) funded through a partnership of FCS, Scottish Government and Scottish Enterprise and the European Regional Development (ERDF).

At a UK level, the [Biomass Energy Centre](#) has additional information, including the CEN/TC335 European standards for solid biomass and the BEAT2.1 tool for life cycle assessment of biomass.

In 2006 the [Carbon Trust](#) launched a 5 year £5 million technology accelerator project known as the Biomass Heat Accelerator. This resulted in the publication of technical guide 2 "[Biomass heating: a practical guide for potential users](#)" and a programme of knowledge dissemination aimed at overcoming barriers to this technology.