Use of Biomass Energy in Aberdeenshire

Information Requirements and Policy Interpretation

January 2006

Supplementary Planning Guidance

Aberdeenshire COUNCIL

Use of biomass energy in Aberdeenshire:

Information requirements and policy interpretation

Supplementary Planning Guidance

This guidance forms part of the RENEWABLE ENERGY STRATEGY:
A strategy to promote the generation of energy from renewable sources

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Copies are also available online at: www.aberdeenshire.gov.uk/planning/supplementary/index.asp

Biomass Energy

Contents

Tables

Executive Summary

In making observations on, or when determining, applications for biomass developments, Aberdeenshire Council will expect information supporting each application to address the issues outlined below. Applications for some biomass developments will be subject to an Environmental Impact Assessment. The detail of information required will depend on the scale of the proposed development.

1. Technical Information

Full technical details of the biomass plant and any associated buildings or structures, and proposals for decommissioning.

2. Site Infrastructure

If relevant, details of temporary and permanent access requirements, including earthworks, for construction, maintenance, servicing and eventual decommissioning. Details of any landscaping works proposed.

3. Grid Network

Details of the proposed grid connection or of supply to local user(s) **if relevant**.

4. Visual and Landscape Impacts

A detailed visual assessment will be necessary for developments **greater than 100kW** or where the proposal is located within a designated landscape, conservation area, town centre, affects the setting of a listed building or scheduled ancient monument, or is visible from a popular viewpoint, both on land and water.

5. Amenity Issues (plants greater than 100kW)

Assessment and submission of details regarding potential amenity impacts. A **Method Statement** , which details potential impacts and mitigation measures during construction may also be required.

6. Access to Utilities

Details of water and drainage, including SuDS schemes may be required.

7. Access to other Utilities and Infrastructure

Details of pipe networks, electricity connections or other associated infrastructure should be included **if relevant**.

8. Transport

Details of proposed routes for servicing and supplying, the number of deliveries, and the need for road or junction up-grades should also be provided. For larger developments, the distance to feedstock provider should also be included.

9. Storage

Details of proposed storage locations and how these are to be accessed by service vehicles should be provided.

10. Other issues

Other issues may arise that are not specific to biomass energy developments, such as **natural and built heritage** or **aviation** interests. These can apply to any development dependent on its scale and location.

1 Introduction

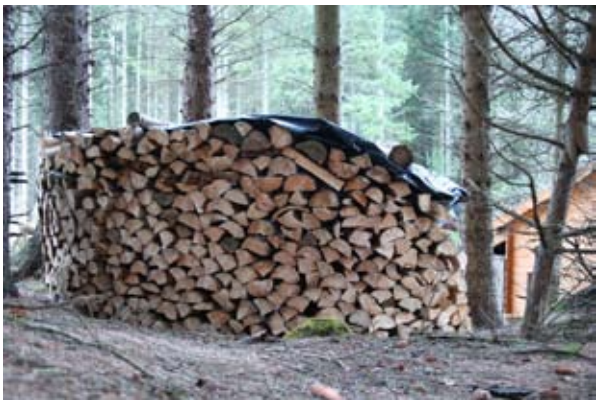
1.1 Aberdeenshire Council adopted the "Renewable Energy Strategy" in December 2004. This strategy aims to encourage the provision of heat and/or electricity from renewable sources, including biomass, within Aberdeenshire, and to make a net contribution to national and global energy needs through the use of renewable energy sources. An action arising from that strategy is the production of this supplementary planning guidance (SPG) to assist individuals, communities and industry, and provide consistency with interpretation of development plan policy on the provision of Biomass energy developments.

1.2 The generation of renewable energy is increasingly being seen as necessary to address climate change, fuel poverty and in promoting sustainable development. The Government has set a target to reduce carbon dioxide emissions by 60% by 2050 and it is hoped that renewable energy sources will help achieve this.

1.3 The Forest and Woodland Strategy for Aberdeen and Aberdeenshire promotes the use of low/mid grade timber residues for use in biomass developments. It also encourages the use of such residues in preference to the planting and use of other biomass crops as the removal of residue helps with better forest management and is readily available. The use of such wood from neglected woodlands would provide a potentially local source of readily available fuel. The founding of such an industry is regarded as a priority by the Strategy.

1.4 The purpose of this document is to advise homeowners, community groups, owners of business premises, developers and to a lesser extent crop producers of the planning and environmental issues that should be considered before submitting a planning application for a biomass energy development. It has been divided into three parts:

- Background information and Policy Overview, which sets out the European Commission's target for renewable energy generation, details the planning policies under which an application would be considered (see Chapters 2 and 3);
- Planning Applications, which sets out what information may be needed to accompany a planning application (Chapter 4); and
- Planning Considerations, which sets out the approach that Aberdeenshire Council will adopt in assessing applications (see Chapters 5-7).



2 Background Information

2.1 Heat and/or electricity can be produced from the burning of organic matter of recent origin, which is known as 'biomass' (see Appendix 1 for further information). Biomass can be generated from woodlands and forests growing timber for fuel production and from other crops specifically grown for the purpose (called 'energy crops'), or from farm residues/animal wastes.

2.2 Energy generation from biomass is expected to contribute up to 74% of the European Commission's target of 12% of energy consumption to be generated from renewable sources by 2010. The extent to which this target is realised depends on a number of factors including; the relative costs of production, selling prices, regulatory regimes and the fiscal regime applicable to competing energy sources.

2.3 Biomass energy plants face stiff competition from installations which have lower capital costs, most of which are powered by non-renewable energy resources. Therefore, it is important that biomass as a form of renewable energy, which is considered carbon neutral, is promoted and encouraged by government through the climate change levy, grants, planning policies and fiscal measures.

2.4 Combined Heat and Power (CHP), which produces both heat and electricity is becoming an increasingly attractive option for both small and commercial biomass plants, offering a reliable low cost heat source in locations where heat has a significant economic value and where there is a concentrated local demand for it.

2.5 Benefits of heat and/or electricity generation from biomass include reduced emissions and a high level of 'up' time. Emissions of sulphur and nitrous oxides from biomass plants are much lower than from conventional power plants burning fossil fuels. Furthermore while fossil fuels contribute to greenhouse gas emissions, heat and electricity derived from biomass is considered neutral in this respect, as the carbon released on combustion is equivalent to that absorbed during growth. For this reason agricultural and forestry by-products used as a substitute for fossil fuels are capable of producing a net reduction in greenhouse gas emissions.

2.6 It is likely that in the course of growing and using energy crops there will be less transport involved than in exploiting fossil fuels, as energy crops are likely to be processed on a relatively small scale and in a local context. The development of biomass power facilities provides an option for farmers to diversify within agricultural production into growing crops for biomass, increasing their income and providing an economic alternative fuel source for themselves or other local or regional consumers.

2.7 Whilst it is unlikely that planning permission would be required for the planting of energy crops, trees (including short-rotation coppice), and energy crops they should avoid areas noted for their natural heritage interests (especially on semi-natural habitats), or built or cultural heritage. The appearance of the crop can be

minimised through sympathetic planting designs, and care should be taken to ensure that pesticides and fertilisers do no pollute the wider environment, nor erode the carbon neutrality of this fuel source. Advice should be sought from the local planning authority and possibly Scottish Natural Heritage during the early stages of site selection.

2.8 The use of farm residues or animal wastes to generate heat and/or electricity is an energy efficient method of disposing of these substances requiring minimum pre-treatment and using existing technology. There are no emissions standards for anaerobic digestion plants, but there are requirements regarding the handling of the biogas (methane) produced during this process.

2.9 The location of biomass energy plants is likely to be determined by a number of factors including the economic costs of transporting high bulk/low value goods: where the feedstock is grown; the availability of feedstock during the year; the location of the end user; and the scale of the plant. The use of local suppliers, as highlighted in the Forest and Woodland Strategy for Aberdeen and Aberdeenshire may also be considered. The local use of low/mid grade timber residues as well as thinnings from the Grampian Forests would provide an economically viable source, facilitating better management of forests.

2.10 The production of heat and electricity from biomass is well established in Europe, for example providing 25% of energy in Finland and 40% of rural heating in Austria. However, within the UK there is a relatively new and growing sustainable energy industry even though existing technology is available, well testied and is becoming more economic as the market expands. Methods for maximising the economic viability of biomass combustion plants are improving every year, with advancements in techniques for gasification and pyrolysis (see Appendix 1 for further information). With further cost reductions expected over the next decade, biomass based on energy crops as well as forestry products has the potential to contribute to sustainable development, particularly in rural areas (National Planning Policy Guideline 6: Renewable Energy Developments paragraph 39) and provide rural jobs (e.g. through fuel processing new markets for timber growers and new jobs to operate a biomass plant).

Did you know?

Depending on the size/insulation in the dwelling, the average annual energy consumption for a UK household is:

- between 3000kWh and 6000KWh (kilowatt - hours) for electricity;
- between 15,000kWh and 22,000kWh for gas (eg. for heating); and
- around 0.33 tonnes of oil equivelant for solid fuel and oil.

A 1kW renewable energy installation can generate 1000kWh of energy annualy.

3. Policy Overview

a) Development Plan Policy

3.1 Development plan policy favourably considers the development of biomass energy, subject to landscape, built and cultural heritage, amenity (including public health and safety), ecological and transportation issues. The developer will have to consider any constraints that may prevent a biomass energy development, regardless of its size, from being located in a particular area.

3.2 At the time of writing, the Aberdeenshire Local Plan is at its finalised stage of development. The Reporters Report has recently been published. Therefore, the biomass energy developments identified in the local plan are not finalised, and may be subject to change, depending on the outcome of the inquiry.

3.3 The Aberdeen and Aberdeenshire Structure Plan (NEST), which was adopted on 21 December 2001, will favourably consider renewable energy facilities, subject to ecological, transportation, landscape and amenity considerations as set out in the local plan. NEST Policy 5 (Renewable Energy Facilities) and Policy Inf\8 (see Table 1) of the finalised Aberdeenshire Local Plan relate specifically to renewable energy facilities other than wind energy which is discussed in Policy Inf\7 (Renewable Energy Facilities - Wind Energy). Key policies considering biomass energy developments will include NEST Policy 3 (Other Employment Opportunities) and local plan plicies Emp\2 (Employment Development in the Green Belt) and Emp\3 (Employment Development in the Countryside).

3.4 Only one site, in Westhill, has a biomass energy development allocation in the local plan. However, sites allocated for 'appropriate employment use' may be suitable for biomass energy development. The developer should discuss potential sites with the local planning authority at an early stage.

3.5 Where future housing land is allocated in the local plan, the developers should consider as the first option the installation of a district heating scheme, or if viable and acceptable to the Local Planning Authority, a combined heat and power plant fuelled by renewable resources. The Planning Authority will usually include the consideration of the feasibility of alternative heating or powering solutions into development briefs prepared for such sites. Where sites are the subject of a development brief, an appraisal of the opportunities to install any type of renewable energy technology should be carried out and demonstrated to the Planning Authority.

Table 1 Finalised Aberdeenshire Local Plan: Policy Inf/8: Other Renewable Energy Sources

Policy Inf\8: Other Renewable Energy Sources	
Renewable energy facilities, other than wind energy developments will be approved, in principle, if located, sited, and designed in accordance with the following criteria:	
a)	the proposal will not compromise public health or safety, including emissions, effluent, residues or ash being released into the atmosphere or watercourses (for example through leaching or run-off);
b)	the proposal has an impact which is assessed and is acceptable on sites of importance to natural heritage, national and local landscapes designations, or areas of ecological importance, in accordance with policies Env\1 to Env\7;
c)	the proposal is appropriate in terms of the scale and nature of the setting of historic buildings, conservation areas, and archaeological sites;
d)	satisfactory steps are taken to mitigate negative development impacts, such as noise (for example from engines, boilers, handling equipment or traffic), visual intrusion, or traffic movement (for example, transporting fuel to the site and subsequent removal of by-products / wastes) on occupiers of nearby properties (in or outwith a settlement boundary);
e)	where applicable, it conforms to the National Waste Strategy and other area and local waste plans and strategies; and
f)	where applicable, land restoration, after care, and after use details are satisfactory.

b) Classification of Biomass Energy Developments

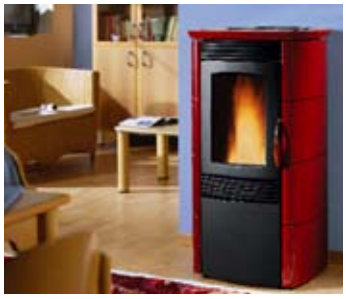
3.6 The following is a list of a few of many potential end users of biomass energy developments:

- employment areas/industrial estates (potential large-scale users);
- hospitals (potential large-scale users);
- supermarkets/retail warehouses (potential large or medium-scale users);
- schools, both primary and secondary (potential medium-scale users);
- swimming pools (potential medium-scale users);
- GP practices/medical centres (potential small and medium-scale users);
- libraries (potential small-scale users);
- community halls (potential small-scale users);
- hotels (potential large or medium scale users);
- domestic (pellets) (small-scale users);
- residential housing (medium-scale users);

- distilleries (medium-scale users);
- paper/pulp mills (large-scale users);
- any other significant users of heat; and
- food factories.

3.7 The potential end users have been categorised into three groups, as shown in Table 2 below.

Table 2 Aberdeenshire Council definitions of scales of renewable energy production

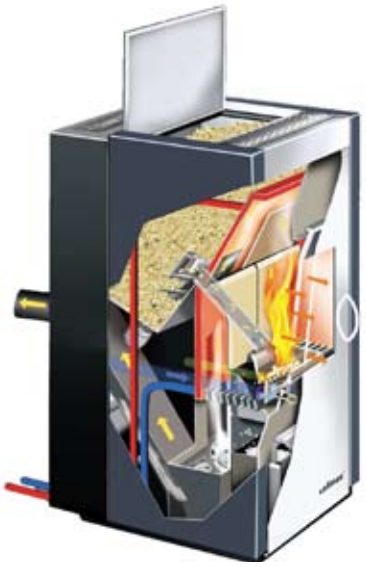
Small scale (<500kW) **(e.g. small boiler unit)**		Wood pellet stove (heat only) (image courtesy of Highland Wood Energy)
Medium Scale (500kW≤2.5mW) **(e.g. unit the size of a double garage plus land for storing feedstock and vehicles)**		30kW installation (heat only), (image courtesy of the Forestry Commission)
Large Scale (≥2.5mW) **(e.g. 1 hectare)**		9.8MW electricity plant

3.8 Further information on the forms of creating bio-energy can be found in Appendix 1.

3.9 The following provides a definition of the terms used in this guidance to describe biomass energy developments:

Domestic or Small-scale schemes:

Manual or automatic feeding log boilers, wood pellet, wood-chip, straw or paper systems to heat water or air (e.g. central heating). It is likely that a flue will be required for most systems. Any heating system must comply with the Building (Scotland) Regulations 2004. Guidance is given in the Scottish Building Standards Technical Handbooks, available in hard copy or on-line at www.sbsa.gov.uk/current_standards/tbooks.htm The boiler does not need to be on all the time as 'accumulators' allow hot water generated from the boiler to be stored in an insulated tank and used to cater for peak demands in excess of boiler capacity.



Cross-section of a 10kW automated Calimax wood pellet boiler for central heating

Combined heat and power (CHP):

An efficient technology for generating electricity and heat together. In normal modes of generation, most of the heat is discharged into the atmosphere. However, a CHP plant simultaneously generates usable heat and power (usually electricity) in a single process. A CHP system can only be built viably in an area where there is a high continuous demand for heat. Therefore, an all-year heat user is desirable, for example a government building, primary or secondary schools, swimming pools, colleges, universities, industrial, retail or commercial building(s). Smaller scale on-site wood-fuelled CHP plant (micro CHP) can be built in rural areas that have a demand for heat and electricity, such as kilns, greenhouses, fish farms, or swimming pools.

District heating:

System of distributing heat around a geographical area (e.g. residential development, school(s), swimming pool(s), hotel(s)/youth hostel(s), commercial premises or other end users) using insulated underground pipes to carry pressurised hot water from a central source. The hot water may either directly heat the properties, by flowing around the central heating system, or transfer heat via a heat exchanger to a closed central heating system. Wood (pellets or chips) or other biomass fuel are fed into a hopper, which is normally located on the outer wall of a building, and is then automatically fed into the burner via an auger, or some other mechanical system, at a controlled rate.

District heating schemes are the most appropriate use for biomass energy in flats. Careful consideration needs to be given regarding payment for such energy. Examples include the use of tokens or cards bought at local shops which activate pre-payment heat meters.

4. Planning Applications

4.1 In making observations on, or when determining, applications for biomass developments, Aberdeenshire Council will expect information supporting each application to address the issues outlined below. Applications for some biomass developments will be subject to an Environmental Impact Assessment. The detail of the information required will be dependant on the scale of the proposed development.

4.2 Technical information

4.2.1 Full technical details of the biomass plant and any associated buildings or structures.

4.3 Site infrastructure

4.3.1 If relevant, details of temporary and permanent access requirements, for construction, maintenance, and servicing. Details of any landscaping works proposed.

4.4 Grid network

4.4.1 Details of the proposed grid connection or of supply to local user(s).

4.5 Visual and landscape impacts

4.5.1 **Where the proposal is located within designated landscape, conservation area, town centre, affects the setting of a listed building or scheduled ancient monument, or is visible from a popular viewpoint or is greater than 100kW in output:** Assessment should include a viewpoint analysis, determination of the zone of theoretical visibility, evaluation of the visual impact and the scope for mitigation of those impacts. Evaluation of impacts should include consideration of alternative sitings of the development and any ancillary buildings (if possible). Represented viewpoints of the proposal should cover both long and short-range visibility and presentation by 'photo/video-montage' is recommended.

4.6 Amenity issues (plants greater than 100kW output)

4.6.1 Assessment and submission of details regarding potential amenity impacts including, but not restricted to noise, ash, dust, smell during operation.

4.6.2 With the exception of smaller developments, details of the construction phase must be clearly set out in a **Method Statement** which aims to identify specific measures a developer plans to take to minimise disruption and mitigate any adverse impacts during construction. The developer should discuss any proposed method statement with the local planning authority, environmental health department,

Scottish Environment Protection Agency, community groups and local people. The following list highlights what should be included in a method statement:

- mitigating or minimising noise nuisance;
- timing construction carefully;
- suppressing or containing dust with water;
- light pollution;
- size of construction compound;
- spillages and pollution of water courses;
- duration of construction; and
- transport and traffic requirements.

4.6.3 Further information on preparing a method statement is available on the Renewable Energy Association website at http://www.r-p-a.org.uk.

4.6.4 Larger plants will require to apply for a permit from the Scottish Environment Protection Agency under The Pollution Prevention and Control (Scotland) Regulations 2000. Schedule 1 of these regulations specifies the type of plant that requires this addition process, which is dependent on power output and fuel type.

4.7 Access to utilities

4.7.1 Details of water and drainage must be submitted with the application **if relevant**. For schemes with difficult water connection and/or discharge, the submission of an on-site SuDS scheme is required, such as settlement ponds, oil traps or reed beds.

4.8 Access to other utilities and infrastructure

4.8.1 Details of pipe networks or electricity connections should be included for end users, or grid connection **if relevant**. Any associated infrastructure, such as sub-stations, must also be included.

4.8.2 For heat only systems, information should include:

- the design and location of the proposed pipe network from a district heating scheme (and/or other) plant;
- the pumping house (if proposed), including height, design, location and colour; and
- proposed access for any potential future upgrade.

4.8.3 For electricity generation schemes, the following information should be provided:

- the route of any underground cable, or the design, location and height of all new electricity pylons proposed required to connect the biomass plant to the National grid or other distribution system;
- an Environmental Statement (where necessary under the 1999 Regulations), including mitigation measures;
- the substation(s), both on and off-site, including the height, design, location and colour; and
- details of any fencing proposed to enclose the substation(s) or other works (e.g. a pumping house).

4.9 Transport

4.9.1 Details of any transportation requirements, such as the proposed route(s), necessary road upgrades, and number of deliveries should be submitted with any planning application. For schemes greater than 500kW, the distance of the feedstock from the end user should also be included.

4.9.2 Developers should refer to Timber Transport Maps[1], which identify the preferred routes for transporting timber, and discuss vehicle access arrangements with the local planning authority and highway authority during the early stages of site selection. When considering the construction phase of the proposal, the developer may wish to discuss with the highway authority the loading and height of local bridges, the setting back or trimming of hedges, and the need for new road developments, such as road widening.

Any planning permission may restrict delivery timings, specify the types and size of vehicles, stipulate traffic routing, and require road impact assessments.

4.9.3 A good road network to deliver feedstock and remove ash or other residues from the plant is important, and any proposed route should avoid roads unsuitable for heavy lorries or for frequent heavy vehicle use. The loading and height of bridges should also be considered when deciding a delivery route, as well as avoiding sensitive land uses such as schools and residential areas (unless delivering feedstock or removing ash from the plant).

4.9.4 Good vehicle access from existing routes and hard roads will be a priority, and the developer/applicant should discuss vehicle access arrangements and highway safety with the local authority roads department.

[1] Timber Transport Maps are available from CGIS, Forestry Commission Scotland, Silvan House, 231 Corstorphine Road, Edinburgh, EH12 7AT. Alternatively they may be viewed at the following web address: http://www.timbermap.org/index.asp. Please note this address is correct at time of writing (December 2005).

4.10 Storage

4.10.1 Details of proposed storage locations should be provided and clear information on how these are to be accessed by service vehicles. Other issues may arise, such as impacts on natural heritage, seepage/leachate issues, groundwater conditions, the location of water courses in the area, on aviation interests and impacts in the built and cultural environment.

4.11 Other issues

4.11.1 Other issues that may need to be considered, regardless of its scale or location are:

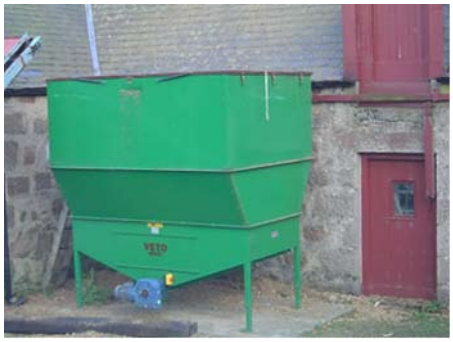
- natural and built heritage;
- aviation interests;
- advice should be sought from Scottish Natural Heritage, Civil Aviation Authority and British Aviation Authority; and
- developers of medium to large scale schemes demonstrate the level of public consultation undertaken.

5 Planning Considerations

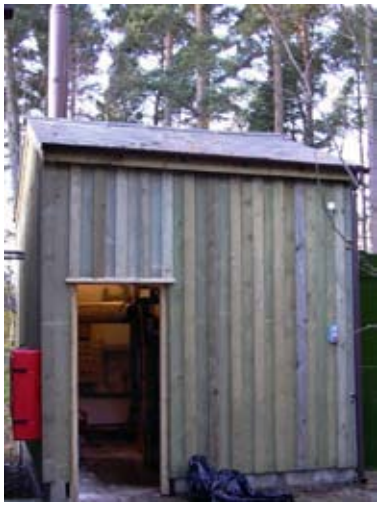
5.1 While the production of heat and/or electricity from biomass is seen as being environmentally friendly and economically beneficial, there can be local impacts, which need to be taken into account. It is important that any significant biomass energy development, regardless of scale, does not result in any detrimental impacts to the ecology, transportation, landscape and amenity of the surrounding area. Developers will also have to consider the health and safety of the suppliers, operators and general public when designing their scheme. Biomass plants can raise the following specific issues:

5.2 Visual and landscape impact

5.2.1 Small scale schemes will have the least visual impacts as the combustion unit and boiler can be accommodated within the structure of the end user, such as a house or school, or be located underground. Where proposed, the hopper, which is used for storing wood fuel, can be attached to the outside of the building in a least sensitive, but accessible location, or in an underground lined pit.



Hopper serving a 60kW boiler (image courtesy of Andrew Nicol of DWP Harvesting and Marketing)



Boiler shed showing the flue (image courtesy of the Forestry Commission)

5.2.2 The chimney or flue of a small-scale biomass energy development is likely to be a visual consideration, as it may cause blight in the landscape or detract from other focal points (such as church steeples) in the landscape or townscape and should be sensitively sited. The developer should seek advice from the local planning authority for the location of the flue/chimney once a site has been identified.

5.2.3 A district heating scheme will probably require a separate building to house the combustion unit, boiler and hopper. Where a pumping station is required, it should be designed in character with the surrounding building types, or screened with fencing, trees or shrubs planted to mitigate any potential visual impacts.

5.2.4 Where a district heating scheme is proposed in a conservation area or within the grounds of listed building(s), favourable consideration will be given if the boiler and hopper are located in an existing building and the flue/chimney is sensitively sited and does not harm their character. If this is not possible, the building erected to house the boiler and/or hopper should not have any adverse impact on the setting or character of the designated buildings/area, and should be constructed using materials that are appropriate to the local vernacular. Other mitigating measures, such as screening e.g. fencing or trees, could be used to reduce any visual impact.

Large scale CHP showing feedstock

Large scale CHP showing feedstock (Shed)

5.2.5 Larger scale biomass energy developments, which require a much larger site for ancillary buildings and wood fuel storage, would be less visually intrusive if it is sited in an existing industrial development area. Screening may also be an appropriate mitigation measure e.g. fencing, trees, using bunds or natural contouring.

5.2.6 The visual impact of overhead power lines can be successfully mitigated by careful route selection that avoids, for example, residential developments and designated habitats or buildings. Where such an impact cannot be successfully mitigated, consideration should be given to using underground cable connections, unless this would disturb valued habitats, which would be difficult to restore.

5.2.7 Where ancillary developments, such as a pumping station are required, consideration should be given to minimising the visual impact of the building housing the boiler.

5.3 Amenity issues

5.3.1 Any proposed biomass energy development should have regard to sensitive land uses. The level of impact a biomass energy development will have on the amenity of the surrounding area during its construction and operation period (e.g. the burning of and delivery of biofuel) will depend on the scale of the scheme.

5.3.2 New power and heat plants in the UK must comply with both UK and European Union emission standards before they can be approved for development. For example, a facility for a wood-fuel plant would require authorisation from either the local authority or Scottish Environmental Protection Agency (SEPA) under Part 1 of the Environmental Protection Act 1990. The local authority will consider smaller units, while larger units will require authorisation from SEPA when emissions to air, water and land will be considered.

5.3.3 During the operation of a biomass energy facility, especially in larger schemes, the following impacts should be considered:

Noise – this type of pollution can occur due to operations at the plant (e.g. engines, chippers or any other equipment) and frequent vehicle movements in and out of

the site. Screening from bunds or natural contouring can help reduce this impact, especially for households within 25m of the site. Further guidance on noise issues can be found in PAN 56 and Circular 10/1999 (noise should be considered in projects of all sizes).

Dust and Smell – the combustion of wood fuel is unlikely to create dust and smell problems beyond the boundaries of the site, although there may be soot from bio-oil boilers. Potential discharges and risks on-site should be identified and mitigated against if they are unavoidable.

Ash – there are two sources of ash from wood fuel combustion – ash collected in the combustion unit (the residue left inside the primary chamber), and ash collected from the flue gasses in a larger plant. The amount of ash produced will depend on the feedstock used and the efficiency of the boiler (e.g. ash levels are now as low as 1%), the transport of ash off-site needs to be carefully considered. The handling procedures for ash are regulated under the Environmental Protection Act.

Local Air Quality Issues – there can be potential environmental impact from emissions from the flue gases; increase of carbon monoxide, carbon dioxide, nitrogen oxides, water and organics. These issues can be a public concern to nearby residential areas and mitigation measures including specific burner design and operation should be addressed within the Environmental Assessment stage. Further information can be obtained in 'Air quality and Landuse Planning' (Scottish Executive, 2000), PAN 51 Planning and Environmental Protection and the Pollution Prevention and Control (Scotland) Regulations 2000.

Light Pollution – should be minimised (taking into account the sensitivity of the surrounding area) and lights on the site should be directed downwards and pointing away from houses within a 100m radius to prevent light pollution.

5.3.4 Planning conditions and/or planning agreements will be used to set out the requirements of a method statement during the construction phase of larger biomass energy developments.

5.4 Access to utilities including water and drainage (electricity or fuel processing plants only)

5.4.1 On-site SuDS may be required where there is a risk of run-off polluting water courses, in order to collect and clean surface water run-off before it is discharged into water courses or sewers. Any means of discharge should be considered at the early planning stages. Where wastewater is produced, such as from the cooling systems, or from the process of converting wood into a liquid or gaseous fuel, it should be analysed to determine the level of contamination and treatment work required. Advice on this should be sought from Scottish Water and the SEPA.

5.4.2 For larger electricity or fuel processing plants, applicants should seek advice from Scottish Water to identify:

- the suitability of the site for water connection;
- whether there is an adequate water supply to serve the plant;
- if upgrades would be required for fresh water or sewerage treatment works; and
- whether a Sustainable urban Drainage System is possible (SuDS).

5.5 Other utilities and infrastructure considerations

5.5.1 The location of natural, built and cultural heritage designations will affect the siting of pipe networks. Care should be taken to avoid significant damage/loss to scheduled ancient monuments, as well as adversely affecting their setting. Consideration will have to be given to the local geology (e.g. bedrock), topography of the land and watercourses that may affect the siting of any proposed biomass energy development and ancillary equipment. Additional pumping stations may be required for difficult terrains, although any district heating scheme should be sited to minimise the need for such pumping stations where possible.

5.5.2 Planning permission may be required for grid connection infrastructure. All electrical cable connections to the grid or end user should be sited underground where possible, subject to Environmental Impact Assessment (EIA). Following a screening process, it may be appropriate to conduct an EIA on grid connection infrastructure where there is an anticipated significant adverse impact. The EIA would assess the environmental impact of the options available.

5.5.3 The local planning authority should be consulted on the route of the overhead power line, in order to allow the planning department to make representations, ask for amendments, or to state whether they have any objections. Careful route selection of overhead power lines may mitigate the visual impacts if they are to be sited in a recreational or populated area.

5.5.4 A small sub-station is needed to transform the electricity to distribution grid network voltage, usually 11kV or 33kV. A standard 3-wire system mounted on wooden poles will then link the sub-station to the nearest suitable point of the grid. Sub-stations' should be screened if sited within a settlement or in a designated landscape, built, natural or cultural area/site.

5.6 Storing feedstock and proximity to fuel sources

5.6.1 The method of storage needs to be considered – either internal protected areas, or external open storage areas. Impacts such as leachate/seepage into water courses/ groundwater, or visual impacts within designated sites need to be considered.

5.6.2 Adequate space for storing feedstock, such as straw, wood chips or pellets is required, as is appropriate access to the boiler/hopper for storing/loading the fuel. Site drainage is also important if the silo is underground, for example the runoff from nearby slopes can cause wetting problems.

5.6.3 The developer should identify a source of feedstock or wood fuel. Feedstocks with low moisture contents should be sought as these keep emissions low. A site survey may need to be undertaken to ensure delivery vehicles can access the hopper/ storage area with sufficient clearance from cables/wires or overhanging trees.

5.6.4 For large-scale schemes, the impact of increased transport movements needs to be considered and while resultant traffic is dependent on plant size and storage capacity, increased vehicle movements within settlements and in areas of high natural or recreational value is a potential issue. Developers are encouraged to work closely with fuel providers in order to minimise impacts.

5.7 Access to main roads and transport networks

5.7.1 The scale of traffic movements during the construction and operating period of a biomass heat and/or power plant will depend on the size of the plant. The increase of traffic around the biomass energy development site will affect residential and busy areas the most. Least impact will be felt in employment areas, as the infrastructure will be in place for heavy road traffic. For the biomass energy development to be a viable and sustainable option in providing waste reduction and a potential heat and electricity source, it should normally be sited within 40km of biomass crop suppliers.

5.7.2 Further reductions in traffic impact can be achieved by locating the biomass energy development close to a (local) source of fuel supply; siting a large scale plant in or adjacent to existing industrial facilities, or close to a trunk road or railway siding; using rail or water to transport the fuel; densifying wood fuel at source (for example by pelletising, chipping or by pyrolysis to create carbon pellets.

5.7.3 Small scale domestic heat generators are unlikely to cause significant impacts compared with a large-scale biomass electricity generating plant. Good vehicle access from existing routes and hard roads will be a priority, as will careful planning to ensure the safety of highway users, especially if vehicles have to go through small settlements. Developers should avoid, where possible, routes that pass through small settlements.

5.7.4 The Council's roads department should be consulted at the earliest possible stage to identify any road, junction, and bridge capacity issues.

6 Environmental Impact Assessment

6.1 An Environmental Impact Assessment (EIA) is a means of gathering information and mitigating likely significant environmental effects of a proposed development, which the local planning authority uses to inform their judgement on whether planning permission should be granted or refused. This information is collected by the both the developer and from other sources, and is submitted by the developer in a report called an Environmental Statement. With any Environmental Statement (ES) prepared, a non-technical summary must also be provided. Further information is available in PAN 58 (Environmental Impact Assessment).

6.2 An Environmental Impact Assessment is only mandatory (a Schedule 1 development) if a proposed **thermal power station** (biomass/biofuel plant) produces a heat output of more than 300MW (please refer to Environmental Impact Assessment (Scotland) Regulations 1999 for further information).

6.3 Annex A of the Regulations sets out indicative thresholds and criteria for when an EIA is more likely to be required, and under Schedule 2 of the Regulations a biomass energy development is known as an "industrial installation", and EIA should be considered if:

- the proposed development is located in a 'sensitive area';
- the industrial installation is for the production of electricity, steam and hot water and the area of the development exceeds 0.5 hectare;
- the industrial installation for the carrying of gas, steam and hot water and the area of works exceed 1 hectare; and
- the proposal is for the underground storage of combustible gases and the area of any new building, deposit or structure exceeds 500 square metres; or a new building, deposit or structure is to be sited within 100 metres of any controlled waters.

6.4 Applicants should discuss with the local planning authority on whether a screening or scoping report will be required prior to submitting a planning application. Where an EIA is required, the developer should consult with the planning authority at an early stage on the precise requirements for carrying out a scoping opinion (see Table 3 overleaf). Schedule 4 in the 1999 Regulations set out a list of information, which should be included in an Environmental Statement.

Table 3 Potential issues for inclusion in response to a scoping opinion

Topic heading	Information requirements
Technical details	Including details on the location, siting, design of the proposed development (including ancillary developments e.g. for grid connection), and construction materials.
Landscape/ Townscape/ Visual impacts	Details of potential impact(s) (e.g. positive – it will enhance a degraded landscape or derelict site, neutral, or negative – it will significantly alter the landscape or townscape setting or where there are other tall structures), including mitigation measures.
Natural environment	Whether there will be a significant impact to habitats and/or species of importance and mitigation measures as well as likely potential loss of biodiversity, and impacts on recreation and amenity of the natural heritage.
Built environment	Impact on local properties, other built heritage including listed buildings and their setting, archaeological sites and their setting, historic land uses, conservation areas, designed landscapes, and historic gardens, if affected.
Hydrology and run-off	Details of potential impact(s) to private water supplies, lochs and water courses, including proposed changes to landform - details of current and proposed drainage patterns and impacts this may have on water flows and water quality; pollution; erosion; sedimentation; discolouration; and mitigation measures.
Infrastructure	Road access and tracks, construction traffic, and road safety.
Cumulative effects	Cumulative impact assessment (e.g. a cumulative impact assessments on landscape, visual, ecological, hydrological, traffic, aviation, recreation, noise and built and cultural heritage). For example where there are other tall structures near the proposed development (e.g. chimneys, masts, antennas, pylons, tall buildings, wind turbines) or other uses affecting the above (e.g. traffic and noise).
Baseline monitoring	Which should continue after commissioning. Refer to the 1999 EIA Regulations for further information.
Pollution	Pollution from vehicles and mitigation measures (e.g. number of vehicles movements and emission levels). Demonstration of emission reductions, particularly against oil burners, and greenhouse gas savings may be provided as an overall picture.

7 Monitoring requirements

a) Applicant/Developer

7.1 All aspects of the plant may need to be monitored, including air and water emissions, noise (if complaints arise), traffic generation and access routes. The scale of monitoring depends of the size of the proposed development, and any such monitoring should begin before the plant starts operating, to ensure that an appropriate benchmark is set.

b) Local Authority

7.2 The Council will regularly review the supplementary planning guidance and take into account development changes in Government guidance and the industry, in order that best practice can be appraised and kept up to date.

8 Further Information

Aberdeen and Aberdeenshire Structure Plan 2001-2016 (North East Scotland together).

Aberdeenshire Council (2006) Finalised Aberdeenshire Local Plan.

Aberdeenshire Council (2004) Renewable Energy Strategy: A Strategy to promote the generation of energy from renewable sources

Aberdeenshire Council (2005) Forest and Woodland Strategy for Aberdeenshire and Aberdeen City.

ALTNER (1999) Renewable energy Business Opportunities in Grampian, Scottish Enterprise Grampian & Energy Technology Support Unit

British Biogen (1999) Good Practice Guidelines: Short Rotation Coppice.

British Biogen (1999) Good Practice Guidelines: Wood Fuel from Forestry and Arbroiculture (more information is available at www.british-biogen.co.uk).

Cobham Resource Consultants (1997) National programme of landscape character assessment: Banff and Buchan, Scottish Natural Heritage Review No 37.

The Conservation (Natural Habitats &c) Regulations 1994.

DEFRA (2005) Biomass Task Force Report to Government, October 2005, www.defra.gov.uk

EC Council Directive on the Conservation of Wild Birds (79/409/EC).

EC Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EC).

Environmental Resources Management (1998) South and Central Aberdeenshire: landscape character assessment, Scottish Natural Heritage Review No 102.

The Environmental Impact Assessment (Scotland) Regulations 1999, Circular 15/1999

EUREC Agency (2002) The Future for Renewable Energy 2: Prospects and directions, James & James (Science Publishers) Ltd.

The Landscape Institute and the Institute of Environmental Management & Assessment (2002) Guidelines for Visual Impact Assessment, Second edition, Spoon Press.

National Planning Policy Guidelines 5 (1994) Archaeology and Planning, The Scottish Executive.

National Planning Policy Guidelines 6 (2000) Renewable Energy Developments, The Scottish Executive.

National Planning Policy Guidelines 11 (1996) Sport, physical recreation and open space, The Scottish Executive.

National Planning Policy Guidelines 14 (1999) Natural Heritage, the Scottish Executive.

National Planning Policy Guidelines 18 (1999) Planning and the Historic Environment, the Scottish Executive.

Nature Conservation (Scotland) Act 2004.

Planning Advice Note 45 (2002) Renewable Energy Technologies, the Scottish Executive.

Planning Advice Note 56 (1999) Planning and Noise, the Scottish Executive.

Planning Advice Note 58 (1999) Environmental Impact Assessment, the Scottish Executive.

Scotland's renewable resource (2001) Volume 1: the analysis, Garrad Hassan and Partners Ltd.

Scottish Building Standards Agency (2004) Building (Scotland) Regulations 2005 www.sbsa.gov.uk/current_standards/tbooks.htm.

Scottish Executive (2000) The Pollution Prevention and Control (Scotland) Regulations, as amended http://www.scotland.gov.uk/consultations/environment/ppcr2-00.asp.

SEPA Pollution Prevention Guidelines (Series), SEPA http://www.sepa.org.uk/guidance/ppg/index.htm.

SNN Wood Fuel for Warmth, SNN http://www.sd-commission.org.uk/scotland/page.php/Woodfuelforwarmth.html.

Turnbull Jeffrey Partnership (1996) Cairngorms landscape assessment, Scottish Natural Heritage Review No 75.

Appendix 1 Technology Overview and Grants

a) Technology overview

1.1 The most common forms of creating bioenergy are listed in Table 4 below.

Table 4 Six technologies to creating bioenergy

Technology	Description
Combustion	The burning of feedstock (wood chips/pellets etc). It is the most commonly used biomass technology to create heat and/or electricity.
Gasification	Converting the organic part of biomass, at high temperatures into a gas mixture with fuel value (thermo-chemical gasification). A rapidly emerging technology.
Pyrolysis	Is a promising technology, which decomposes biomass between 300 – 700°centigrade in the absence of oxygen to produce solids, or more commonly, liquids, and a mixture of combustible gases.
Biodiesel - Esterification	Chemical modification of vegetable oils, e.g. rape seed into esters for use in engines. -
Anaerobic digestion	Converting organic waste into biogas (methane and carbon dioxide) to be used in gas, diesel or dual fuel engines. Biogas can be exploited from landfill sites, and can be used as a waste management method.
Bioethanol	Ethanol-based transport biofuels can be used as a substitute for petrol. It can also be used as an additive, in which case it is described as a fuel extended because you can get more miles per gallon. Raw materials are sugar and starch-rich crops such as cereal grains, sugar beat, potato and sweet sorghum, maize and sugarcane (worldwide).

b) Grants

1.2 Grants are available for community schemes, individuals (e.g. household and a business premises), and for housebuilders. Further information is available from the Scottish Community and Householder Renewables Initiative (SCHRI), who provide advice, project support and grants. SCHRI can be contacted on 0800 138 8858 or online at http://www.est.org.uk/schri/.

1.3 For businesses, an interest free loan may be available through the Scottish Energy Efficiency Office – Loan Action Scotland. Further information is available at www.energy-efficiency.org.

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