E.ON

# Blackburn Meadows Renewable Energy Plant

Sustainability Statement

Issue

E.ON

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## Sustainability Statement

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# Contents

Note: Section 6.1 and 7.4 of this report show a Carbon Dioxide displacement figure of 90,000 tonnes per annum, it should be noted that this should read `at least 80,000 tonnes per annum' instead.

# Executive Summary

## Introduction

This Sustainability Statement, prepared by Ove Arup and Partners Ltd (Arup) for E.ON (E.ON), accompanies an outline planning application for the development of a Renewable Energy Plant at Blackburn Meadows, Sheffield. The Statement outlines the commitments made by E.ON to ensure that the project meets the criteria for a sustainable development.

## Social

The assessment finds that the proposed development offers a number of social benefits, including investment in local community initiatives, improvements to the landscaped area, and advantages for community health and wellbeing. Potential negative impacts, such as noise and vibration, will be carefully regulated. Local people will be consulted and encouraged to participate at all stages of the development to ensure their satisfaction.

## Environment

A full Environmental Impact Assessment has revealed no serious impacts resulting from the new Renewable Energy Plant. Where risks do exist, for example with respect to atmospheric emissions, water quality and flood risk, appropriate mitigating measures will be implemented. Adoption of Best Available Technologies for Plant design and a comprehensive Environmental Management System will help to ensure the ongoing neutrality of the Plant for the environment.

## Natural Resources

The proposed Plant is expected to utilise sustainably sourced building materials and to re-use materials already existing at the site. Building design will follow BREEAM recommendations or equivalent. There will be comprehensive waste management systems in place both during construction and operation. When fully operational the Plant will divert some of the 180,000 tonnes of waste wood from landfill each year. Best Available Technologies will ensure minimal use of water and high levels of energy efficiency.

## Economic

In light of regional, national and international targets to reduce greenhouse gas emissions and increase the proportion of energy derived from renewable sources, the proposed Plant is considered financially viable and beneficial to Sheffield's regeneration objectives. The Plant will create a number of employment opportunities – both directly and indirectly – for the local community. Traffic generated by the Plant will be absorbed by the existing road networks.

## Response to Sheffield City Council's Sustainability Guidance

The overall findings of Arup's sustainability assessment suggest positive consequences of the proposed Plant for the broad objectives of Sheffield City Council. In summary:

- Does the project support and help revitalise the local economy? ✓
- Does the proposal reinforce Sheffield's neighbourhoods and communities? ✓
- Does the proposal provide a range of transport options and inclusive access? ✓
- Does the proposal protect and enhance Sheffield's natural environment and resources? ✓
- Does the proposal integrate high quality design and construction? ✓

# 1 Introduction

## 1.1 Background

This Sustainability Statement has been prepared by Ove Arup and Partners Ltd (Arup) for E.ON (E.ON). The Statement accompanies an outline planning application for the development of a biomass-fired power station at Blackburn Meadows. The application is being submitted by E.ON to Sheffield City Council.

The sustainability of the existing proposals was appraised using Arup's Sustainable Project Appraisal Routine (SPeAR®) as a framework. The SPeAR® framework is an accepted format for producing sustainability assessments and statements for local planning applications in the UK.

SPeAR® allows a project to be appraised against the key elements of sustainability:

- Society;
- Environment;
- Natural resources;
- Economy.

This Sustainability Statement describes the commitments made by E.ON to ensure the performance of the proposed project with respect to these four key areas. The statement also presents a response to Sheffield City Council's guidance for examining the sustainability of planned developments.

To ensure that the scheme continues to develop in line with sustainability principles, E.ON is committed to undertaking a full SPeAR® appraisal of detailed designs as the project progresses.

## 1.2 Site Description

Blackburn Meadows is an 10.9 hectare site within E.ON UK's existing landholding, located between Sheffield and Rotherham. The site previously accommodated the Blackburn Meadows coal-fired power station, which ceased operation nearly 30 years ago. E.ON now proposes to re-develop the site to house a new Renewable Energy Plant fuelled by biomass.

The proposed site lies immediately to the east of the M1 motorway between Junction 34 Meadowhall (north) and Tinsley (south) roundabouts, approximately 5.5km northeast of Sheffield city centre. The site is within the Don Valley and on the flood plain of the River Don, which borders the site at its southern side. An operational Yorkshire Water Sewage Treatment Works is located to the north and northeast of the site, and the settlement of Tinsley lies around 300 metres to the south.

The site is accessed at the northwest corner via Alsing Road, which links to the Meadowhall Way and thereby to the A6109 and Junction 34 of the M1. The option for the future development of a new link road is currently being investigated by Sheffield City Council. This would connect Meadowhall Way with Sheffield Road to the south of the site.

The site is flat and featureless. The structures of the former power station have been removed, apart from the two cooling towers[1]. Some concrete foundations also remain. A 33kV Yorkshire Electricity sub-station is located near to the centre of the site, although this is not part of the proposed development area. Otherwise, the site has been left to regenerate naturally.

[1] The proposed demolition of the cooling towers does not form part of this Renewable Energy Plant planning application and is the subject of a separate application.

Blackburn Meadows has been identified by the Sheffield Development Framework Preferred Options for City Sites (2007) as suitable for industrial uses and warehouses. The City Council's Scoping and Feasibility Study on Renewable Energy (2006) also specifically considers the site as appropriate for Biomass Renewable Energy.

## 1.3 Overview of Proposed Development

The proposed Plant will occupy a raised area of land on the northeastern edge of the site boundary.

The entire development will be contained within the present E.ON landholding. It will consist of a single generating unit, to include a combustor and boiler, and a steam turbine which is likely to be housed in a separate building. The generating unit will discharge its flue gas through a chimney stack. The remainder of the site will be landscaped to achieve biodiversity gains.

The proposed Renewable Energy Plant is anticipated to generate 25MW of electricity, with provision to supply heat to neighbouring commercial and industrial establishments. The principal biomass fuel to be burned will be recycled waste wood sourced from the local area. Other fuels such as energy crops, forest/sawmill residues and solid recovered fuel may be considered, dependent upon price and availability, to supplement the recycled wood. The Plant would require a fuel supply of around 180,000 tonnes per year. The Plant will also make heat (in the form of steam and/or hot water) available. This is considered further in the Environmental Statement which accompanies the application.

# 2 Methodology and Scope

## 2.1 Methodology

This Sustainability Statement outlines the commitments made by E.ON towards the sustainable development of the Blackburn Meadows Renewable Energy Plant. The review undertaken in preparing this statement has considered:

- Blackburn Meadows – Biomass Renewable Energy Plant: Draft Design and Access Statement;
- Blackburn Meadows – Biomass Renewable Energy Plant: Environmental Impact Assessment Scoping Statement;
- Blackburn Meadows Draft Environmental Statement;
- Draft Core Strategy Sheffield Development Framework;
- Regional Spatial Strategy for Yorkshire and Humberside;
- Sheffield City Council Scoping and Feasibility Study on Renewable Energy;
- Sheffield City Strategy 2005-10 (2007);
- Sheffield Development Framework Preferred Options for City Sites;
- Sheffield Development Framework Preferred Options for City Policies;
- Sheffield Unitary Development Plan;
- Yorkshire and Humber Plan. The Draft RSS Incorporating the Secretary of State's Proposed Changes.

The review was conducted to determine the sustainability credentials of the development proposals at the point of the submission of outline planning, using information gathered from the above documentation, discussions with the client team and assessments by independent specialists.

## 2.2 Scope

The statement follows the framework of the Arup Sustainable Project Appraisal Routine (SPeAR®), covering four key topic areas: the social, environmental, natural resource and economic sustainability of the development. The statement also provides a summary response to Sheffield City Council's sustainability guidance.

### 2.2.1 Social Sustainability

Social sustainability involves improving quality of life through an understanding of the following issues:

- Facilitating social inclusion;
- Enhancing amenity value and accessibility;
- Optimising form and space;
- Maximising user comfort/satisfaction;
- Considering health and welfare.

The social sustainability credentials of the development are presented in section 4.

### 2.2.2 Environmental Sustainability

Environmental sustainability is about maintaining the quality of the environment through a clear understanding of environmental effects, sensitivities and alternative solutions, keeping environmental impacts below the level required to allow the systems affected to recover and continue to evolve.

Within the scope of environmental sustainability, consideration is given to:

- Maintaining and protecting air quality;
- Ensuring sustainable land use;
- Maintaining and protecting water quality;
- Protecting and enhancing ecology and cultural heritage;
- Ensuring sustainable design and operations;
- Promoting sustainable transport options.

The development's environmental sustainability is detailed in section 5 of this statement.

### 2.2.3 Natural Resources

Sustainable development involves using non-renewable resources more efficiently, increasing their productivity to ensure sustainable economic and societal growth without depleting stocks for future generations. Concurrently there must be a drive to develop alternatives that will replace their use. Sustainable resource use considers:

- Materials;
- Water;
- Energy;
- Waste Hierarchy.

Sustainable management of natural resources will be assessed in section 6.

### 2.2.4 Economic Sustainability

Economic sustainability addresses the issue of financial viability and wealth creation, and its distribution within and among communities. Within the scope of economic sustainability, consideration is given to:

- Securing financial viability;
- Maximising competition effects;
- Increasing employment/skills base;
- Promoting public transport systems;
- Optimising social benefits.

The economic sustainability of the proposed Plant is assessed in section 7.

### 2.2.5 Response to Sheffield City Council Sustainability Guidance

Sheffield City Council has produced guidance for prospective developers, to ensure that planning proposals are formulated with the principles of sustainable development in mind and that the processes are documented in a Sustainability Statement. The guidance translates the latest national, regional and emerging local position on sustainability and climate change, setting out five key questions as the starting point for considering sustainable development:

- Does the proposal support and help revitalise the local economy?
- Does the proposal reinforce Sheffield's neighbourhoods and communities?
- Does the proposal provide a range of transport options and inclusive access?
- Does the proposal protect and enhance Sheffield's natural environment and resources?
- Does the proposal integrate high quality design and construction?

Section 7 of this sustainability statement provides a summary of findings, in response to the Sheffield City Council guidance.

# 3 Social

## 3.1 Social Responsibility

The development at Blackburn Meadows will build on E.ON's strong corporate record for investment in the community. E.ON is committed to establishing a Community Investment Fund to be managed by Sheffield City Council in conjunction with E.ON of up to £1000 per MW of power produced, with the money to be allocated to local projects contributing to sustainable development.

As a business, E.ON places emphasis on delivering community projects with direct relevance to core business and expertise. To date these have included:

- Projects with Age Concern, Social Services and Carers' Associations to deliver support for older people during the winter months and in emergencies;
- Creation of a web resource and associated fund – E.ON SOURCE – to support development of efficient and sustainable energy measures for community organisations; and
- The Central Networks Safer Environment Fund which supports community projects which have a positive and lasting impact on the local environment.

E.ON works closely with the National Trust, Business in the Community, Education Business Partnerships and Sharing the Caring, and has long-term relationships with local schools to directly support curriculum-based learning, sporting initiatives and awareness of safety issues associated with power generation and supply. Social responsibility is reported annually via a Corporate and Social Responsibility report, which follows the Global Reporting Initiative's (GRI's) G3 guidelines.

## 3.2 Amenity

### 3.2.1 Design Phase

The proposed development at Blackburn Meadows will be a Biomass Renewable Energy Plant with associated flood mitigation and landscaping. The former Tinsley Cooling Towers currently dominate views of this area.

The proposed design of the site is such that the Plant will be located in the northern section, leaving the southern area as largely open land and therefore in harmony with the green space south of the River Don. The overall objective for the design of the Plant will be to create a clean industrial character consistent with its role in the use of sustainable energy generation technology, its visible location and context, and E.ON's corporate objectives. The overall image of the site is intended to be of a modern and functional industrial facility set in a green environment, creating a positive and recognisable sustainable presence.

A landscape and visual assessment study has identified some significant changes to the landscape as a result of the proposed energy Plant, particularly as viewed from the Transpennine Trail. Mitigation measures - such as the use of building materials with low visual impact and landscaping in the south of the site - provide the opportunity to minimise potential adverse effects where it is not feasible to screen views, and thereby create positive landscape and visual impacts in areas in close proximity.

The site itself will be fenced and not accessible to the public for reasons of security and safety. However, plans for the site visitor facilities for organised visits from schools and the general public. As part of the development it is also anticipated to enhance the boundaries of the site, particularly adjacent to the Transpennine Trail where it follows the River Don and the Tinsley Canal. This route is defined as part of the Sheffield Green Network.

By replacing the remains of a previous coal-fired power plant in a mixed use industrial area, the development presents little conflict with existing amenity value and has the potential to

increase recreational enjoyment by contributing to Yorkshire Forest tree-planting objectives and the aesthetic value of the Transpennine Trail.

### 3.2.2 Construction Phase

The Plant construction programme will be up to 30 months from placing of contracts to full commercial operation. Noise arising from construction will be managed under the Control of Pollution Act Section 61 Prior Consent process. A minimum initial requirement to control noise during the construction phase of the project will also be placed upon the contractor, particularly during the evening hours.

At the peak of construction, traffic generation will be about 325 vehicles per day, including Heavy Goods Vehicles (HGVs). As all vehicles will travel along Alsing Road, which is remote from residential noise receptors, their impact on nearby communities will be minimal. A noise impact assessment has assessed the maximum percentage change in noise levels due to construction to be of neutral significance.

### 3.2.3 Operation Phase

Whilst the proposed Plant will operate 24 hours per day, 7 days per week for 90% of the year, noise levels will be carefully controlled. Best Available Technologies will be used in design and layout of the Plant to ensure low noise design. The Plant supplier will be required to guarantee that the noise from the Plant does not contain any tonal or impulsive character that could potentially be annoying to local residents.

As the noise climate in the vicinity of Blackburn Meadows is already affected by traffic and industrial noise, it is E.ON's expectation that operations at the new Renewable Energy Plant should give rise to noise which is barely discernible against background sound levels. No additional disturbance of nearby communities or industries is anticipated.

Once operational, the levels of traffic generated will be significantly reduced compared with the construction phase. It is anticipated that deliveries of biomass would take place six days per week, totalling approximately 33 lorries per day across a 10 hour period. These deliveries are not considered to represent a significant impact. There is no foreseeable disturbance in public or residential areas due to ground vibration resulting from the operation of the proposed Plant.

E.ON's Environmental Management Systems (EMS) for power plants include a specified procedure for logging and responding to public complaint regarding noise and acting to prevent reoccurrence. The Blackburn Meadows Renewable Energy Plant will have its own specific EMS certified to ISO14001, to cover the specific issues associated with the biomass combustion process.

## 3.3 Access

E.ON demonstrates sensitivity to the varying needs of its staff, suppliers and customers throughout its business policies and activities: from the provision of specialised customer services to those with disabilities to a commitment to equal opportunities and diversity within the staff body.

At the Blackburn Meadows site, disabled visitor and staff parking will be provided in appropriate locations close to the main Administration Building. There will be disabled access to and throughout this building. Regulations do not require disabled access within the Plant itself and for reasons of practicality and safety this will not be provided.

## 3.4 Form and Space

The redevelopment of a derelict site at Blackburn Meadows will in itself help to enhance the outlook and overall feeling of supervision of the area. Access to the core of the site will be controlled by a gatehouse at the western side to maintain security. On-site security

personnel will be present 24 hours per day, 7 days per week, and will be supported by CCTV surveillance.

Whilst the site will be inaccessible to the general public, this will be no change from the current status and should therefore have no impact on community cohesion or amenity value.

The Blackburn Meadows site will incorporate the main biomass energy Plant and accompanying facilities, in addition to an administration building. The latter will house amenities for staff such as a cafeteria and changing rooms.

External lighting will be necessary throughout the night to enable safe operation of the site. Lighting will be designed to avoid negative impacts on nearby residential areas and natural habitats.

## 3.5 Stakeholder Satisfaction

### 3.5.1 Design Phase

E.ON is committed to working with the local community, and welcomes and supports communication with all stakeholders to improve understanding of concerns. Extensive public consultation has already been undertaken around Blackburn Meadows, including:

- Attendance at Darnall Ward Area Panel, East Area Strategy Group, and Tinsley Forum;
- Notification of proposed development application via leaflet drop to neighbours;
- Public exhibitions providing information on the proposed new development, its location, processes and expected impacts and the planning process, with opportunities for questions and answers with engineers working on the development;
- Webpage, email enquiry address and freephone telephone number for further information about the project; and
- A newsletter for local residents, which can be downloaded from the website or by contacting the community liaison team.

Issues arising during public consultation have been considered and E.ON will ensure the design, construction and operation of the proposed Plant and its residual impacts on local residents are reduced to a practical acceptable minimum.

### 3.5.2 Construction Phase

E.ON intends to continue incorporating proper community consultation and participation in the project planning and decision-making process for the proposed development. Community engagement will continue throughout the 30-month construction period of the Blackburn Meadows Plant. Information will be provided via a 3-monthly newsletter to local people, and E.ON will make timely presentations to community groups to explain the process and overcome any problems encountered.

### 3.5.3 Operation Phase

E.ON has a public commitment to reduce the number of complaints lodged by customers with the consumer watchdog, Energywatch. At the end of 2006 E.ON were placed second in Energywatch's league table, recognising E.ON's low number of customer complaints.

In terms of staff satisfaction, E.ON is an accredited Investor in People. The 2005 Employee Opinion Survey showed that staff has a sense of pride and shared identity through being part of the E.ON Group.

## 3.6 Health and Wellbeing

E.ON implements Safety Management Standard OHSAS 18001 and views health and safety as its number one priority. The design of the proposed Plant will incorporate features that ensure satisfaction of E.ON's statutory responsibilities under Acts of Parliament such as the Health and Safety at Work Act 1974. Where appropriate, the Health and Safety Executive (HSE) will be consulted about safety issues associated with the development. Planning and management throughout the design and construction of the Plant will comply with the Construction (Design and Management) Regulation 2007.

E.ON offers a comprehensive package of benefits to ensure the health and wellbeing of employees, including:

- employment policies regularly reviewed to ensure that they support flexible and family-friendly working;
- provision of an Employee Assistance Programme providing free and confidential advice for all employees, as well as an Occupational Health helpline;
- an Active Energy programme providing voluntary health assessments, including advice and follow-up care on stress, lifestyle and diet.

E.ON's actively promotes health and safety to schools and other groups. This includes an objective to ensure as many people as possible have access to sport at all levels. Sporting initiatives have arisen out of E.ON's sponsorship of the National Rugby Community Programme and rugby league Champion Schools Tournament, and of the FA Cup, FA Women's Cup, FA Youth Cup and the FA Schools Programme.

# 4 Environment

## 4.1 Air Quality

### 4.1.1 Design Phase

Biomass-fuelled energy plants are regarded as effectively carbon neutral (see section 7.1). The proposed 25MW Plant at Blackburn Meadows will displace other sources of energy with a greater climate change impact. It is expected that the Plant will displace more than 80,000 tonnes of carbon dioxide emissions annually (as compared with the emissions of a fossil fuel-based plant of equivalent size).

Sheffield City Council is a partner in the Sheffield Clean Air Partnership, which aims to improve air quality in the city. The Council is therefore keen to ensure that the air quality impacts of new developments, including those arising from the traffic they generate, are minimised. Best Available Technologies will be utilised in the design phase of the Plant to ensure that emissions are minimised and harmful particulates are filtered from gases before release into the atmosphere. Mitigation measures have also been proposed to limit the environmental impact of traffic generated by the Plant.

### 4.1.2 Construction Phase

An Air Quality Assessment of the proposed development has been undertaken as part of the Environmental Impact Assessment. It is anticipated that dust levels during construction of the Plant will be minimal and mitigating measures will be adopted, including sheeting of HGVs carrying loose materials and frequent washing of roads and surfaces. The Air Quality Assessment anticipates that residential properties are situated at adequate distance from the site to be unaffected by dust. There are no other facilities within 500m of the site with the potential to show high sensitivity to dust according to government guidance (ODPM, 2005).

An assessment of the possible impacts of odour arising from the construction site has revealed that the construction process would not involve any activities particularly associated with odour.

An assessment of the air quality impacts of construction traffic show that the predicted local impacts are of minor significance and are unlikely to cause a breach of air quality objectives.

### 4.1.3 Operation Phase

The Air Quality Assessment revealed the main source of impacts on local air quality during operation to be emissions of nitrogen oxides and sulphur dioxide, formed as part of the combustion process. Reagents will be injected into the exhaust gases to neutralise emissions to the atmosphere, and release of nitrogen oxides will be minimised by appropriate flue gas treatment techniques. The Plant will be operated to Integrated Pollution Prevention and Control (IPPC) standards, attained by the principles of Best Available Technology.

Conversion of nitrogen oxides to nitrogen dioxide in the atmosphere is expected to result in beneficial reductions in local concentrations of low-level ozone, which is hazardous to human health.

Atmospheric dispersion models confirm that emission concentrations will correspond to the limits specified in the Waste Incineration Directive (European Commission, 2000), which the Plant will be obliged to meet. Concentrations of the main pollutants released from the Plant will comply with air quality standards, both alone and taking into account background concentrations. On this basis, emissions to air from the proposed Plant are not expected to have a significant adverse effect on human health or natural habitats. Impacts on the city-wide Air Quality Management Area and the designated Sheffield M1 Corridor Air Action Zone adjacent to the site are considered negligible both by the Air Quality Assessment and the Scoping and Feasibility Study on Renewable Energy in Sheffield.

Dust and particulates will be filtered from the Plant's exhaust gases before discharge to the atmosphere. Appropriate site management practices will be adopted to minimise risk of dust nuisance.

It is not anticipated that emissions arising from traffic flows to and from the proposed Plant will have significant effects on local air quality. Any potential impacts will be mitigated, to every reasonable endeavour, by ensuring that heavy and light duty vehicles are fitted with exhaust after treatment technologies, or that they meet Euro III standard minimum and are upgraded to Euro IV standard by 2011. A fleet management plan will be adopted if necessary.

Wood chip fuel is not inherently odorous and is not expected to create odour other than that of the natural wood. Fuel wood quality will be carefully inspected to ensure minimal contamination and therefore avoid unpleasant odour. The Plant is not expected to include any other components that generate odour.

## 4.2 Land Use

The site of the proposed development is owned by E.ON. It was the location of the former Blackburn Meadows coal-fired power station, which was demolished in the 1970s. The concrete foundations of the former buildings are still in situ and the land is now largely overgrown. The new development and all associated temporary construction activities will be accommodated within the E.ON land holding and will constitute rehabilitation of a derelict brownfield site.

The site has been identified by Sheffield City Council's Scoping and Feasibility Study on Renewable Energy (2003) as potentially appropriate for Biomass Renewable Energy.

There is an electrical export infrastructure located at the site, comprising 33kV sub-stations owned by the local network operator, YEDL. It is proposed that the connection circuit from the Renewable Energy Plant would be via an existing 33kV circuit breaker. The proximity of the adjacent Primary Sub-station would reduce energy loss in transmission to the National Grid and minimise the environmental impacts of having to establish longer distance connections either by underground cable or overhead pylons.

Some land contamination has been identified on site as a result of the previous site use. A survey has been carried out for asbestos containing material. This did not highlight significant concentrations of asbestos at the site. Contamination is in the main minor and sporadic. Due to the limited nature of the inspection, a watching brief will be maintained when significant excavation of the site is required. Caution will be applied and operatives informed. A further contamination testing and monitoring regime is currently underway which will provide remedial recommendations as necessary. All methods will be approved by the authorities before execution.

The site has been identified by the Environment Agency as being in Flood Zone 3a, comprising land assessed as having significant chance of flooding from the River Don. Flood Risk Assessment suggests that the site has the potential to flood from the south and west. Development of Plant infrastructure will therefore be concentrated on a raised section towards the northern boundary of the site. The area will be re-profiled to create a platform above predicted flood levels. Compensation areas will also be formed, and managed to enhance local biodiversity. Reduction of paved surfaces will reduce the impermeable area, and consequently the rate of runoff.

Flood risk limits the total developable area of the site, making the density of development consistent with the development patterns of the surrounding area.

## 4.3 Water Quality and Discharge

### 4.3.1 Construction Phase

A Water Quality Assessment has been undertaken as part of the Environmental Impact Assessment. Potential effects on water quality from the construction site include run-off of suspended solids and chemical or oil spillages reaching the drains or contaminating groundwater. These will be managed under an environmental management plan designed to prevent such impacts.

### 4.3.2 Operation Phase

Surface water from the development will be discharged via a best practice Sustainable Urban Drainage System (SUDS), to prevent pollution to the River Don and groundwater. This will comprise of a three stage process as recommended in The SUDS Manual guidance. Green roofs and permeable paving will be used to minimise surface water runoff. Residual runoff will pass through filters or under-drained swales for an early cleaning process. The second stage treatment will include open swale conveyance routes to carry water to storage basins. Finally, a proposed wetland storage feature will control release of runoff to the floodplain.

A simple rainwater harvesting system will be in operation, using rainfall and runoff from hard roofs to provide non-potable water for uses such as toilet flushing.

A review of site practice will be undertaken to determine pollution prevention measures and ensure that risks are managed appropriately. On-site storage facilities for processed biomass fuel and ash will be enclosed to avoid contamination of surface water through dissolution or from suspended solids from these stores.

Foul drainage water will be discharged into the existing sewer network. Yorkshire Water has confirmed that there is sufficient capacity for this discharge. There should therefore be no contamination of groundwater or river water resulting from the proposed development.

## 4.4 Biodiversity

On-site biodiversity is relatively low at present and does not constitute a constraint to development. The land is largely overgrown with a number of silver birch trees, scattered scrub and dense continuous scrub around the perimeter.

Landscaping of the site will promote biodiversity and complement the nearby Blackburn Meadows Local Nature Reserve, thereby contributing positively to the local conservation value of this part of the River Don corridor. Opportunities for use by a range of wildlife will be incorporated into site design. Trees will be retained wherever possible. Additional planting may also take place with an appropriate native tree and shrub woodland mix, thereby contributing to Yorkshire Forest objectives for increased tree planting in the region. The UK Biodiversity Action Plan and Sheffield Local Biodiversity Action Plan will be used to guide the detailed design of new habitats on the site. Where habitats are to be affected by development appropriate replacement and enhancement measures will be taken. It is anticipated that the majority of the landscaped area will be self-sustaining, although Sheffield Wildlife Trust may be asked to contribute to its effective management.

There are no Natura 2000 sites within 10km of Blackburn Meadows. Though there are a number of Sites of Special Scientific Interest (SSSI), only one of these (Moss Valley Meadows) has been designated for the presence of sensitive vegetation. Assessments of air concentrations, nutrient nitrogen deposition and acid deposition have been performed, confirming that none of these processes are likely to damage the site's special interest features.

Three Sites of Importance for Nature Conservation (SINCs) and a part of the Green Heritage Network lie within a 2km radius of Blackburn Meadows. Nuisance to these sites during construction and operation of the biomass plant will be controlled and monitored

through the site's Environmental Management Plan. A site-specific Biodiversity Action Plan is also to be considered.

In consultation with English Heritage and the Local Authority, E.ON has also undertaken an assessment of the archaeological and historical features in the locality, in a bid to harmonise the Blackburn Meadows development with the historical and cultural identity of the area. There is no known focus of significant archaeological remains on the site.

## 4.5 Soil

Since Blackburn Meadows is a brownfield site, it is unlikely that indigenous soil profiles remain.

## 4.6 Design and Operation

### 4.6.1 Design

The BREEAM environmental assessment method or equivalent for Industrial Buildings will be used to inform design standards for the proposed Plant, and Best Available Technology (BAT) incorporated to ensure that processes at the Plant are future-proofed as far as currently possible.

### 4.6.2 Operation

E.ON is active in the development of new low carbon technologies that can help to tackle the issues of climate change and security of energy supply. The Renewable Energy Plant at Blackburn Meadows will employ BAT to reduce air emissions to as low a level as possible and in compliance with the Pollution Prevention and Control Act 1999.

E.ON operates Environmental Management Systems certified to ISO14001 to ensure that legal requirements are met and to help manage environmental risks arising from the operation of its plant. E.ON staff are trained in methods of environmental management and generally exhibit high levels of environmental awareness.

## 4.7 Transport

### 4.7.1 Freight Traffic

A former rail link is present in proximity to Blackburn Meadows, however, it is not considered viable to re-instate the link at this time. Due to difficulties associated with using the canal system, the most appropriate form of transport during construction and operation of the proposed Plant will be the existing road network.

E.ON recognises that transportation distances need to be minimised. E.ON will therefore seek to source fuel from within a reasonable distance of the Plant. When the Renewable Energy Plant becomes operational, the number of vehicle trips is expected to be very low and therefore can be absorbed by the existing road network.

### 4.7.2 Employee Travel

The Blackburn Meadows site is accessible via public transport. The bus and tram interchange at Meadowhall is located approximately 600m from the Alsing Road entrance to the site. The pedestrian link between the site entrance and the interchange will be reviewed to provide safe and direct access for both pedestrians and cyclists. This may include an enhanced tram warning system at the tram level crossing on Alsing Road.

Vehicular access will initially be along Alsing Road until such time as the Fixed Link Road is resolved. On reaching the site, the access route will divide to separate conventional traffic from freight.

A travel plan is not being prepared for the site, as its traffic generation is under that which requires travel plans according to guidance from Sheffield City Council. However, E.ON is

aware of the requirement to accommodate and encourage non-car modes as a means of accessing the site.

# 5 Natural Resources

## 5.1 Materials

### 5.1.1 Construction Phase

During construction of the proposed Plant it is envisaged that existing concrete foundations from the previous power station will be excavated and re-used on site where possible. It is intended to use this material in the raising of the core development area as part of the flood management strategy. Similarly, soils excavated during the construction process will be used for flood mitigation and/or the landscaping element of the project. This re-use will help to minimise the number of construction traffic movements to and from the site.

Building materials will as far as possible be sustainably sourced. Cladding materials will be selected on a basis of compliance with requirements to be affordable, long lasting in an urban industrial environment and sustainable with regard to energy consumption in production and transportation, use of natural resources and capability to be recycled. Potential materials are considered in the Design and Access Statement which accompanies the Blackburn Meadows Renewable Energy Plant planning application.

### 5.1.2 Operation Phase

The principal biomass fuel to be burnt by the Plant will be primarily clean recycled waste wood. Other biomass fuels such as energy crops, forest/sawmill residues and solid recovered fuel may be considered, dependent upon price and availability, to supplement the recycled waste wood.

Feasibility studies have been conducted to identify sources of waste wood. Estimates for wood-based arisings from the study area are in the range of 810,000-2.5million tonnes per year, which should meet the requirements of a 25MWe Plant. Projections for growth rates in Civic Amenity sites suggest that the quantity available will double in less than 20 years (Excelar, 2002) through increases in the waste stream and waste recovery. Whilst the material will need to be transported to site, this is likely to be equivalent to transportation to landfill sites or recycling plant.

## 5.2 Water Use

### 5.2.1 Construction Phase

During construction of the Plant there is a possibility of some water being required for chemical cleaning. Such processes will be controlled closely by formal method statements and agreed with the Environment Agency. It is anticipated that there will be very little need for cleaning with modern manufacturing and construction techniques.

### 5.2.2 Operation Phase

Owing to the use of BAT in the design of the Plant, and particularly the anticipation of employing an air cooled condenser which will consume negligible quantities of water, the supply from the existing public water main will be sufficient for operation of the Plant. It is not anticipated that cooling water will be abstracted from or discharged to the River Don.

Rainwater harvesting, involving the collection and storage of rainwater from the roofs of buildings and paved “clean” areas, will supplement the water supply for Plant facilities (i.e. flushing toilets).

## 5.3 Energy

### 5.3.1 Design Phase

Energy efficiency measures will be incorporated into the design of the Plant buildings where possible. For example, the roofs and sloping elevations may provide opportunities to

incorporate some photovoltaic solar collection panel assemblies as well as significant areas of diverse planting, which in addition to their visual amenity, natural habitat and drainage contribution, will also contribute to the thermal performance of the buildings.

### 5.3.2 Operation Phase

The Renewable Energy Plant will use the energy it generates from biomass for the large majority of its energy needs. Consequently it will greatly exceed the 10% target for generating electricity needs from renewable sources, as laid down by Sheffield's Preferred Options of the City Policies. Energy consumption will be monitored along with other resources as a part of the manual operating procedures at the Plant.

## 5.4 Waste

### 5.4.1 Construction Phase

Construction waste will be recycled where possible in accordance with an Environmental Management Plan and Waste Management System.

### 5.4.2 Operation Phase

It is estimated that approximately one skip load of unusable wood fuel and/or rejects will be generated each day as waste. Wherever possible this will be sold on for re-use.

Furnace Bottom Ash produced during operation will be sold wherever possible. There is significant demand for this type of ash within the construction industry, mostly for road construction. E.ON will be seeking long-term ash sales options in the locality. E.ON has successfully sold an average of over 85% of ash produced from existing units during the period 2001-5.

Filter Ash is likely to be disposed of to a suitable licensed landfill site, the nearest of which lies approximately 500m from the proposed Plant. Alternative disposal methods are being considered, such as whether ash could be composted. This will not be possible if heavy metals are present in the wood fuel. Every effort will be made to sell waste ash if possible.

Solid wastes produced during the water treatment process will be concentrated and dewatered if necessary, and finally disposed of to landfill or other such route as identified in accordance with local environmental and pollution control legislation.

A recycling strategy will be put in place to ensure that other everyday wastes generated, such as paper, are recycled where possible. This is standard practice for E.ON and forms part of the site Environmental Management System.

# 6 Economic

## 6.1 Viability

Under the Kyoto Protocol UK has a legally binding commitment to reduce emissions of six greenhouse gases by 12.5% below 1990 levels over the period 2008-12. UK Government climate change goals build on this foundation, aiming for a 30% reduction in carbon dioxide below 1990 levels by 2020.

The electricity sector is responsible for around 37% of the country's carbon dioxide emissions. According to figures from the Department for Trade and Industry, in 2005 power stations alone were responsible for around 31.5% of carbon emissions. However, biomass–fuelled stations are regarded as effectively carbon neutral: although the facility will release carbon dioxide during the combustion of biomass, this carbon comes from biogenic sources which consume carbon dioxide from the atmosphere during growth. Such power stations therefore play a fundamental role in meeting national emissions targets.

The 25MW Plant at Blackburn Meadows will displace other sources of energy with a greater climate change impact. It is expected that the Plant will displace more than 90,000 tonnes of carbon dioxide emissions annually (as compared with the emissions of a fossil fuel-based plant of equivalent size).

UK Government recognises the benefits of renewable energy and is actively supporting the growth of renewable generation to tackle climate change. It has set a target for 15.4% of electricity supplied in the UK to come from renewable sources by 2015, and a further target of 20% by 2020. The Renewables Obligation has been put in place to support delivery of this objective. This obliges electricity retailers in Britain to obtain an increasing proportion of the energy they supply from renewable sources. The requirement to meet this obligation makes the Blackburn Meadows Renewable Energy Plant development viable under prevailing market conditions.

Continued growth in the demand for power means the UK needs long-term investment in new generating capacity. Around 19GWe of generating plant will close by 2020. This capacity will need to be replaced by lower carbon alternatives. Recognising this need, Yorkshire and Humberside Regional Spatial Strategy establishes targets for renewable energy generation, including a target for Sheffield of at least 10.6MWe by 2010. The Renewable Energy Plant at Blackburn Meadows will help to satisfy such goals, producing sufficient electricity to meet the needs of approximately 40,000 homes. By diversifying and securing energy supply, the growth of the renewable energy sector will promote price stability.

### 6.1.1 Risk Management

E.ON's Risk Management Executive meets monthly to discuss key risk and operational issues affecting the business, and to review regulatory risks. Risks are managed using an internal control framework. Risks are controlled and performance improved through planned, independent reviews conducted through an audit plan. The risk management system is being evolved to cover non-financial risks.

### 6.1.2 Displacement Effect

There will be no displacement effects, such as relocating businesses or housing, occurring as a result of the development at Blackburn Meadows. The site is already under ownership by E.ON. The existing YEDL substations located at the site will remain.

## 6.2 Competition Effects

### 6.2.1 Vitality and Regeneration

This renewable energy development will make a significant contribution towards the planning and regeneration Objectives of the City. The Sheffield Unitary Plan adopted in March 1998 allocates the land encompassing the application site as Proposed Industrial and Business site. This designation was supported by the 2007 Sheffield Development Framework Preferred Options for City Sites, which stated that the site should be dominated by general industry or warehouse uses.

Consideration will be given to the relationship between the project and the wider programme of regeneration in the Lower Don valley, including Housing Market Renewal Pathfinder status.

It is also expected that the development of a new renewable energy stream will broaden the choice of available energy supplies, thereby contributing to increased competition within the sector.

### 6.2.2 Supply Chain

E.ON is a member of the UN Global Compact Network and operates a Responsible Procurement Policy specifying the minimum standard of Corporate Social Responsibility (CSR) performance expected of suppliers, their sub-contractors and business partners. The Policy is included in tender specifications and is a consideration whenever business is awarded to suppliers. The Plant Manager of the Blackburn Meadows Renewable Energy Plant will be responsible for implementing the Responsible Procurement Policy for all procurement activities during Plant operation, and will be trained accordingly.

E.ON is committed to sourcing fuel for the Blackburn Meadows Plant from within a reasonable distance. A developed market for wood waste would probably attract material if competitive and offering a steady demand. Increases in landfill tax will continue to ensure that people are keen to seek alternative options to landfill and thus stimulate market growth.

Experience at other biomass-fuelled energy plants has demonstrated an expansion of local forestry and sawmilling operations as a consequence of the plant, as well as opening up a new income stream for local farmers to provide energy crops as a supplementary source of biomass fuel.

## 6.3 Employment and Skills

### 6.3.1 Employment

E.ON anticipates that a new Renewable Energy Plant will contribute to local employment opportunities. It is expected that the construction work force will be sourced from the local area wherever possible. At the peak of construction in February 2010, it is estimated that approximately 200 workers will be present on site.

Once fully operational, the proposed Plant at Blackburn Meadows is expected to employ around 40 full time personnel. This will comprise a range of employment types including engineering, administrative and managerial staff. Opportunities will be available for flexible, part-time and shift working. A third of employment opportunities will be at graduate level.

Additional contract personnel are likely to be employed to undertake routine and annual maintenance. Catering, cleaning and maintenance contractors will be drawn from the local area, and indirect employment will be created in support industries for the biomass supply infrastructure.

E.ON is committed to working with Sheffield City Council to explore the potential to maximise the access of local people to construction and permanent jobs at the site. Jobs with E.ON will be advertised in the local area following the existing E.ON training

programmes for Apprentices and Graduates to equip them for a role at E.ON, potentially in the Blackburn Meadows Renewable Energy Plant.

E.ON complies with the E.ON Group framework for equality and diversity, and are establishing a revised policy to promote diversity within the business.

### 6.3.2 Skills

E.ON is a certified Investor in People and actively encourages staff learning and development. A number of opportunities are available, including:

- Apprenticeships in Electrical Distribution/Connections, Energy Generation, Gas Installation and Technician roles, incorporating professional qualifications and hands-on training;
- Re-training programmes to encourage new entrants to retrain for jobs in the energy sector, including older age groups and mothers returning to work;
- A series of talent development programmes for individuals at key development stages in their careers, combining tailored learning opportunities, mentoring and opportunities for networking and exposure to senior managers; and
- An extensive range of training programmes covering topics from leadership to business and personal skills.

Such opportunities to develop personal and professional skills will be available to all E.ON staff at Blackburn Meadows Renewable Energy Plant.

## 6.4 Transport

Freight will be transported to and from the Renewable Energy Plant by road. At the peak of construction this will generate up to 325 vehicles per day. The transport assessment suggests that this can be accommodated by the existing local, highway and motorway road networks. Mitigation measures are proposed to maximise highway safety and minimise the traffic and environmental impacts of freight vehicles.

Once the Plant is operational, freight traffic will be greatly reduced to approximately 33 lorries per day. The timings of deliveries will be assessed and it is anticipated that the freight traffic generated by the site will add little in percentage terms to the morning and evening peak traffic flows. There are no long-term impacts on traffic flows.

Low employee numbers at the site will create minimal need for staff travel. There will be effective connections with the surrounding area via the local and motorway road network, and via public transport using the bus and tram interchange at Meadowhall. The Alsing Road access route will be made suitable for pedestrians and cyclists in addition to motor vehicles.

The design of the Plant is such that there will be very little vehicle movement around the site itself.

# 7 Response to Sheffield City Council Sustainability Guidance

This chapter draws on the detailed sustainability assessment of chapters 4-7 to reach overriding conclusions about E.ON's proposed Blackburn Meadows development, thereby answering the City Council's sustainability guidance.

## 7.1 Does the proposal support and help revitalise the local economy?

The Sheffield City Strategy (2007) states an ambition for Sheffield to have 'an economy that matches the best in Europe'. The City Council identifies some priority actions which will help to achieve the strengthened economy to which it aspires. These include:

- Stimulating enterprise and entrepreneurialism particularly in the most deprived areas;
- Encouraging innovation and the growth of the knowledge economy;
- Reducing worklessness and improving skills;
- Further reducing the number of young people not in education, employment or training;
- Establishing strategic marketing of the city, to encourage companies to invest in the city.

The development of a Renewable Energy Plant at Blackburn Meadows will assist in revitalising the local economy in a number of ways:

- The Plant will create an innovative, viable and sustainable new industry for the area, seen to be at the cutting edge of its field with respect to international, national and regional climate change and energy supply targets (section 7.1);
- The development will offer long-term and flexible local employment opportunities with E.ON, with a comprehensive package of employee benefits, on-the-job training and personal development prospects (section 7.3);
- It will stimulate short-term and long-term employment in the wider economy, including for construction/housekeeping contractors and industries supplying materials to the Plant (section 7.2-7.3). Increases in employment and activity in the area promise a rise in spending in local shops and services;
- The overall investment will enhance the outlook of the area by bringing a derelict site back into beneficial use (section 4.2). It is hoped that uplifting the area will encourage further development nearby.

## 7.2 Does the proposal reinforce Sheffield's neighbourhoods and communities?

The City Strategy also outlines the actions considered necessary for 'every neighbourhood to be a successful neighbourhood' and for achieving 'inclusive, healthy communities', including:

- Closing the gap between the most deprived neighbourhoods and the city average, and ensuring that all neighbourhoods have access to good quality local services and opportunities;
- Sustaining a strong, vibrant voluntary, community and faith sector;
- Encouraging individuals to participate fully in the wider life of their communities and to engage with decisions that affect their neighbourhoods;
- Increasing feelings of safety and reducing anti-social behaviour;

- Ensuring Sheffield is a Healthy City through tackling wider determinants of health.

With this framework in mind, the Renewable Energy Plant proposals for Blackburn Meadows can help to reinforce Sheffield's neighbourhoods and communities in the following ways:

- Communities around Blackburn Meadows will be benefited by the availability of jobs (section 7.3). E.ON is committed to investing in its employees through lifelong learning (section 7.3);
- The positioning of the Plant allows for easy access via public as well as private transport, opening up opportunities at the site to all (section 5.7);
- E.ON has a commitment to establish a Community Fund in conjunction with community groups around Blackburn Meadows (section 4.1);
- E.ON recognises the value of volunteer action to support activities in neighbouring community groups and schools. A visitor centre is also planned for Blackburn Meadows to support education objectives (section 4.1);
- E.ON is actively consulting the local community to improve understanding of operations at Blackburn Meadows (section 4.5);
- E.ON's investment in a derelict part of the city will bring a greater feeling of supervision and control over the area, increasing feelings of safety (section 4.2.1);
- The site will be under 24 hour surveillance to deter crime and maintain safety (section 4.4);
- The development proposes to enhance the boundaries of the site, potentially adjacent to the Transpennine Trail. This will increase the amenity value of the area for the outdoor leisure of local people and visitors (section 4.2).

## 7.3 Does the proposal provide a range of transport options and inclusive access?

The City's goal for transport is to 'establish excellence in its public transport system'. This ambition should include ensuring connectivity across the network. Whilst the nature of the Blackburn Meadows proposals means that the development will not contribute to the transport system per se, measures have been taken to ensure no detrimental impacts result.

The proposed Plant will be suitably located to enable efficient access to the site by both employees and industrial traffic:

- The Plant will be accessible via public transport (section 5.7);
- The link road between the public transport interchange and the site entrance will be upgraded to provide safe access for pedestrians and cyclists (section 5.7);
- Staff vehicle access will be along Alsing road (section 5.7). There will be safe and direct access between car parking and access points to buildings (section 4.3);
- Disabled parking will be in the most accessible locations and, wherever possible, buildings will be accessible by wheelchair (section 4.3);
- The site will have good connections with the surrounding area via nearby road networks. The magnitude of traffic generated by the site will be absorbed by the existing road infrastructure (section 7.4).

## 7.4 Does the proposal protect and enhance Sheffield's natural environment and resources?

The proposed Plant at Blackburn Meadows will contribute in a number of ways to the achievement of 'environmental excellence' in Sheffield, as aspired to by the City Strategy:

- The commissioning of a biomass power plant to fulfil increasing energy demands will displace around 90,000 tonnes of carbon dioxide emissions every year, thereby contributing to Sheffield's emissions reduction objectives and renewable energy generation targets (section 5.1 and 7.1);
- Redevelopment of a former industrial site will protect Sheffield's green spaces and require the clean-up of derelict contaminated land (section 5.2);
- The proposals for the Blackburn Meadows site will incorporate flood mitigation and compensation areas, helping to alleviate flood events in the area (section 5.2);
- A Sustainable Urban Drainage System will be implemented to prevent pollution to the River Don and groundwater. Water quality in the River Don will be protected by a water treatment plant to filter surface run-off (section 5.3);
- The landscaped section of the site will increase biodiversity to reinforce the 'green corridor' of the Tinsley Canal (section 5.4);
- The Plant will significantly decrease the quantity of waste wood going to landfill in Sheffield (section 6.1);
- Water consumption of the Plant will be minimal. The existing public water main, supplemented by rainwater harvesting, will be adequate (section 6.2).

## 7.5 Does the proposal integrate high quality design and construction?

In line with the City Strategy's ambition for 'an attractive, sustainable, low-carbon city', the overall image of the site is intended to be modern, functional and green, creating a positive and sustainable landmark. Sustainability in design and construction will be assured in a number of ways:

- Construction will take place in line with regulations and standards such as the Construction (Design and Management) Regulation 2007;
- Environmental Impact Assessments have been undertaken and recommendations will be implemented to overcome residual impacts (section 5 and 6);
- The design of the Plant and associated buildings will be informed by BREEAM design standards (section 5.6);
- Best Available Technologies will be used within the Plant to ensure its longevity (section 5.6);
- Building materials will wherever possible be sustainably sourced (section 6.1);
- Energy efficiency measures will be incorporated into the building design (section 6.3).

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