



Quod

Environmental Statement Volume I: Main Text

Barry Biomass Facility

JULY 2022

Q220002

Table of Contents

Environmental Statement: Volume I

Chapter 1: Introduction

Chapter 2: Site and Context

Chapter 3: EIA Methodology

Chapter 4: Alternatives

Chapter 5: Description of the Development

Chapter 6: Construction and Decommissioning

Chapter 7: Climate Change and Greenhouse Gases

Chapter 8: Noise and Vibration

Chapter 9: Air Quality

Chapter 10: Population and Human Health

Chapter 11: Effect Interactions

Chapter 12: Summary of Mitigation Measures, Monitoring and Likely Residual Effects

Volume II – Landscape and Visual Impact Assessment

Volume III – Technical Appendices

Glossary

Advanced Thermal Treatment	<p>A suite of technologies which have the capacity to convert solid waste materials into gas for the generation of renewable energy. Technologies include Pyrolysis, Gasification and Anaerobic Digestion. The technologies used to utilise renewable fuels or waste include:</p> <ul style="list-style-type: none"> - Direct firing open cycle steam turbine systems, - Integrated gasification combined cycle turbine systems, - Integrated pyrolysis combined cycle turbine systems, - Anaerobically generated biogas fuel in reciprocating engine or gas turbine systems.
Air pollution control residue	<p>APC residue (APCR) is typically a mixture of ash, carbon and lime. It is a hazardous waste which is usually disposed of at a hazardous waste landfill or undergoes further processing (treatment) such as washing or stabilisation to send to a non-hazardous landfill.</p>
Air quality objective	<p>Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).</p>
Air quality standard	<p>The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).</p>
Ambient air	<p>Outdoor air in the troposphere, excluding workplace air.</p>
Annual mean	<p>The average (mean) of the concentrations measured for each pollutant for one year. Usually this is for a calendar year, but some species are reported for the period April to March, known as a pollution year. This period avoids splitting winter season between 2 years, which is useful for pollutants that have higher concentrations during the winter months.</p>
Appeal	<p>On 14 October 2021, prior to the effective date of the Enforcement Notice, the Biomass UK No. 2 Limited served notice of its appeal against the Enforcement Notice on the Welsh Ministers under section 174 of the TCPA 1990 (Ref: CAS-01341-N2Q5B8).</p>
Appellant	<p>Biomass UK No. 2 Limited. N.B. the term 'operator' has been used interchangeably with Appellant.</p>
Baseline Studies	<p>Studies of existing environmental conditions which are designed to establish the baseline conditions against which any future changes can be measured or predicted. For the purpose of the Appeal ES, the</p>

	following baselines were considered: pre-construction baseline, current baseline and future baseline.
Brownfield site	A site comprising previously developed land.
Carbon Capture and Storage	Carbon capture and storage (CCS) is the process of capturing and storing carbon dioxide (CO ₂) before it is released into the atmosphere. CCS from bioenergy involves the utilisation of biomass as an energy source and the capture and permanent storage of the CO ₂ produced.
Combined Heat and Power	Simultaneous generation of usable heat and power (usually electricity) in a single process
Conservation Area	An area designated by the Local Authority as being of special architectural or historic interest under the provisions of the Planning (Listed Buildings and Conservation Areas 1990) Act, the character or appearance of which it is desirable to preserve or enhance.
Construction Environmental Management Plan	Tool for implementing the mitigations identified within the Environmental Statement and the conditions of the planning application.
Construction Method Statement	A document which addresses the health and safety risks to workers and other personnel on site during the construction phase of a project.
Construction Phase Plan ('CPP')	The CPP, prepared by the Contractor, which identified the major pieces of plant and equipment that were to be used on Site. The CPP was prepared in accordance with the Construction Design and Management Regulations 2015.
Cumulative effects	Cumulative effects result from the combined impacts of multiple developments as well as multiple in-scheme impacts.
The 'Development'	The Development (as built) comprises a renewable energy generation facility comprising three main buildings and a single freestanding. The Development is shown in the planning application drawings accompanying the ES in Appendix 5.1.
Dioxin	Dioxins and dioxin-like compounds, a diverse range of chemical compounds which are known to exhibit "dioxin-like" toxicity. In chemistry, a dioxin is a heterocyclic 6-membered ring, where 2 carbon atoms have been replaced by oxygen atoms.
Dispersion modelling	The mathematical simulation of how air pollutants disperse in the ambient atmosphere.
Dust	Particles typically in the size range 1 to 75 µm in aerodynamic diameter.
Enforcement Notice	An enforcement notice is a notice served against unauthorised development requiring the unauthorised development to be demolished or the unauthorised use to cease, for example.

Environmental Impact Assessment	A process by which information about the environmental effects of a project is collected, both by the developer and from other sources, and taken into account by the relevant decision making body before a decision is given on whether the development should go ahead.
Environmental Permit ('Permit')	Document issued by Natural Resources Wales in 2018, then subsequently varied in March 2019 (Ref. No: EPR/AB3790ZB) under the Environmental Permitting Regulations (England and Wales) 1996.
Environmental Statement 'ES')	Environmental Statement to be submitted by 29 th July 2022 pursuant to the Appeal process. This includes such information that is reasonably required to assess the environmental effects of a development.
Exceedance	A period of time where the concentrations of a pollutant is greater than, or equal to, the appropriate air quality standard
'Facility'	The Barry Biomass renewable energy recovery plant.
Flood Risk	The risk of flooding posed to a defined receptor. Sources can include fluvial (rivers), tidal (estuaries and the sea), groundwater, surface water runoff, artificial drainage systems, canals and impounded waterbodies (i.e. canals, reservoirs, ponds, flood defences). Receptors that can be affected include people, property, infrastructure and wildlife.
Fuel Feedstock	Raw material required for a process. The Development uses Fuel Grade (Grade C) waste wood.
Fugitive emissions	Emissions arising from the passage of vehicles that do not arise from the exhaust system.
Gasification	Gasification is a process that converts organic or fossil based carbonaceous materials into carbon monoxide, hydrogen and carbon dioxide. This is achieved by reacting the material at high temperatures (>700°C), without combustion, with a controlled amount of oxygen and/or steam
Gross External Area	A measure of floor space calculated in accordance with the Royal Institution of Chartered Surveyors (RICS) code of Measuring Practice.
Gross Internal Area	The area of a building measured to the internal face of the perimeter walls at each floor level.
Health Impact Assessment	HIA is a process that considers how the health and well-being of a population may be affected by a proposed action, be it a policy, programme, plan, project or a change to the organisation or delivery of a particular public service.
Impact Significance	Opinions from a relevant planning authority at an initial stage as to what are the nature and potential scale of the environmental impacts arising

	from the proposed development, and assessing what further studies are required to establish their significance.
ISO14001	ISO 14000 is a family of standards related to environmental management that exists to help organizations (a) minimize how their operations (processes etc.) negatively affect the environment (i.e. cause adverse changes to air, water, or land); (b) comply with applicable laws, regulations, and other environmentally oriented requirements, and (c) continually improve in the above.
Listed Buildings	A building or structure included in the list made by the Secretary of State for Culture Media and Sport of special architectural or historic interest.
Local Nature Reserve	Statutory designations made under Section 21 of the National Parks and Access to the Countryside Act 1949, and amended by Schedule 11 of the Natural Environment and Rural Communities Act 2006, by principal local authorities with wildlife or geological features that are of special interest locally.
Mitigation	Any process, activity of thing designed to avoid, reduce or remedy adverse environmental impacts likely to be caused by a development project.
Mitigation measures	Measures designed to avoid or minimise adverse environmental effects.
Net Internal Area	The usable area within a building measured to the internal face of the perimeter walls at each floor level.
Non-Technical Summary	A summary of the Environmental Statement in 'non-technical language'.
On-site	Taking place or available on the Site.
Off-site	Referring to a location other than the Site.
Ordnance Datum	Land levels are measured relative to the average sea level at Newlyn, Cornwall. This average level is referred to as 'Ordnance Datum'.
Pathways	The routes by which impacts are transmitted through air, water, soils or plants and organisms to their receptors.
Percentile	The percentage of results below a given value.
Permeability	The extent to which an environment allows people a variety of access routes through it. A permeable environment is one where there is ease of movement and where people have a choice of the routes they may use.
Permit	Document issued by Natural Resources Wales in 2018, then subsequently varied in March 2019 (Ref. No: EPR/AB3790ZB) under the Environmental Permitting Regulations (England and Wales) 1996

Phase 1 Contaminated Land Desk Study	An assessment to establish the previous uses of the Site or land nearby or adjacent to it, and to identify potential sources of contamination, receptors and pathways.
PM _{2.5}	The term PM _{2.5} refers to the fraction of particles with aerodynamic diameters equal to, or less than, 2.5 µm. More precisely, the definitions specify the inlet cut-off for which 50% collection efficiency by a particle separator is obtained for these sizes.
PM ₁₀	The term PM ₁₀ refers to the fraction of particles with aerodynamic diameters equal to, or less than, 10 µm. More precisely, the definitions specify the inlet cut-off for which 50% collection efficiency by a particle separator is obtained for these sizes.
Polycyclic Aromatic Hydrocarbons	Polycyclic aromatic hydrocarbons (PAHs), also known as poly-aromatic hydrocarbons or polynuclear aromatic hydrocarbons, are potent atmospheric pollutants that consist of fused aromatic rings and do not contain heteroatoms or carry substituents. Naphthalene is the simplest example of a PAH. PAHs occur in oil, coal, and tar deposits, and are produced as by-products of fuel burning (whether fossil fuel or biomass). As a pollutant, they are of concern because some compounds have been identified as carcinogenic, mutagenic, and teratogenic.
Project Environmental Plan ('PEP')	The PEP, prepared by the Contractor (Galliford Try) identifies and manages the environmental risks associated with the construction stage of the Facility.
Pyrolysis	Pyrolysis is a thermochemical decomposition of organic material at elevated temperatures in the absence of oxygen.
Receptor	A 'receptor' is a component of the natural or built environment (such as a human being, water, air, a building or a plant) that is affected by an impact of construction works and/or the operation of a proposed development.
Renewable energy	Renewable energy is generally defined as energy that comes from resources which are continually replenished on a human timescale such as sunlight, wind, rain, tides, waves and geothermal heat. Renewable energy is also defined under the Renewable Energy Directive as comprising energy from the biomass fraction of waste.
Residual Impacts	Those impacts of the development that cannot be mitigated following implementation of mitigation proposals.
Risk Assessment	An assessment of the likelihood and severity of an occurrence.
Runoff	The overland flow of water from either impermeable surfaces, or areas where precipitation is collecting faster than it can infiltrate into the ground.

Scheduled Monument	A 'nationally important' archaeological site or historic building, given protection against unauthorised change.
Screening Direction	A screening decision made by Welsh Ministers on whether an environmental impact assessment is required as part of a planning application (or an enforcement appeal).
Scoping	An initial stage in determining the nature and potential scale of the environmental impacts arising from the proposed development, and assessing what further studies are required to establish their significance.
Scoping Opinion	A written statement of the opinion of the relevant planning authority as to the information to be provided in the Environmental Statement.
Setting	The context in which a building or area can be appreciated.
The 'Site'	Area defined by the land shown in Chapter 1: Figure 1.2. Land off Woodham Road, Vale of Glamorgan, Wales. Total area: 1.07 ha.
Site of Special Scientific Interest	The best sites for wildlife and geological features in England as designated under the Wildlife and Countryside Act 1981.
Synthetic gas (syngas)	Syngas, or synthesis gas, is a fuel gas mixture consisting primarily of hydrogen, carbon monoxide, and very often some carbon dioxide. The name comes from its use as intermediates in creating synthetic natural gas (SNG) and for producing ammonia or methanol.
Validation (modelling)	Refers to the general comparison of modelled results against monitoring data carried out by model developers.
Validation (monitoring)	Screening monitoring data by visual examination to check for spurious and unusual measurements (see also ratification).
2010 Permission	The development proposals as defined by the 2010 appeal decision (Ref: Ref: Z6950/A/09/2114604).
2015 Permission	The development proposals as defined by the outline planning permission dated granted in July 2015 (Ref: 2015/00031/OUT) and pursuant to the reserved matters application approved in April 2016 (Ref: 2015/00031/5/CD).

Abbreviations

AADF	Annual Average Daily Flows
AADT	Annual Average Daily Traffic flows
AAP	Area Action Plan
AAWT	Annually Average Weekday Traffic
ACC	Air Cooler Condenser
ACM	Asbestos Containing Materials
AEP	Annual Exceedance Probability
AGNET	Defra Acid Gases and Aerosols Network
AMP	Accident Management Plan
ANC	Association of Noise Consultants
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
APCR	Air Pollution Control Residue
AQA	Air Quality Assessment
AQAL	Air Quality Assessment Level
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQMP	Air Quality Management Plan
AQO	Air Quality Objective
AQS	Air Quality Standard
AQTAG	Air Quality Technical Advisory Group
As	Arsenic
ATC	Automatic Traffic Counter
ATT	Advanced Thermal Treatment
BAT	Best Available Technique(s)
BAT-AEL	BAT Associated Emission Level
BECCS	Bioenergy with Carbon Capture with Storage
BEIS	Business, Energy and Industrial Strategy
BREF	BAT Reference Note
BRES	Business Register and Employment Survey

BS	British Standard
BS EN	British Standard European Norm
BS PAS	British Standard Publicly Available Specification
BUG	Bicycle User Group
C ₆ H ₆	Benzene
CA	Conservation Area
CCC	Committee on Climate Change
CCS	Carbon Capture Storage
CCTV	Closed-Circuit Television
Cd	Cadmium
CEM	Continuous emissions monitor
CEMP	Construction Environmental Management Plan
CEMS	Continuous Emissions Monitoring System
CFD	Computerised fluid dynamics
CH ₄	Methane
CHP	Combined Heat and Power
CIEEM	Chartered Institute of Ecology and Environmental Management
CIL	Community Infrastructure Levy
CITB	Construction Industry Training Board
CLP	Constructions Logistics Plan
CO	Carbon Monoxide
Co	Cobalt
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide Equivalent
COMEAP	Committee on the Medical Effects of Air Pollutants
COSHH	Control of Substances Hazardous to Health
COT	Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment
CPP	Construction Phase Plan
Cr	Chromium
Cr(III)	Trivalent Chromium
Cr(VI)	Hexavalent Chromium

CROW	Countryside and rights of way Act 2000
CRTN	Calculation of Road Traffic Noise
CTMP	Construction Traffic Management Plan
Cu	Copper
CV	Calorific Value
CW	Clinical Waste
CWS	County Wildlife Sites
DAA	Directly associated activity – Additional activities necessary to be carried out to allow the principal activity to be carried out
DAM	Development Advice Maps
dB	Decibel
DBA	Desk-Based Assessment
DDOC	Decomposable Degradable Organic Carbon
Defra	Department for Environment, Food and Rural Affairs
DEM	Digital Elevation Model
DEMP	Demolition Environmental Management Plan
DfT	Department for Transport
DMP	Dust and Particulate Emission Management Plan
DMPO	Development Management Procedure (England) Order
DMRB	Design Manual for Roads and Bridges
DPD	Development Management Document
DSP	Delivery and Servicing Plan
EA	Environment Agency
EAL	Environmental assessment level
EC	European Commission
EclA	Ecological Impact Assessment
EHO	Environmental Health Officer
EHIA	Environmental Health Impact Assessment
EIA	Environmental Impact Assessment
ELV	Emission Limit Value
EMAS	EU Eco Management and Audit Scheme
EMS	Environmental Management System

EPA	European Protection Act
EPAQS	Expert Panel on Air Quality Standards
EPR	Environmental Permitting Regulations
EPSML	European Protected Species Mitigation Licence
EPUK	Environmental Protection UK
ERA	Environmental Risk Assessment
ES	Environmental Statement
EU	European Union
EV	Electric Vehicle
FGT	Flu Gas Treatment
FPMP	Fire Prevention and Mitigation Plan
FRA	Flood Risk Assessment
FTE	Full-time Equivalent
GEA	Gross External Area
GHG	Greenhouse Gases
GIA	Gross Internal Area
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GTP	Green Travel Plan
GWP	Global Warming Potential
H ₂ O	Water
Ha	Hectares
HCl	Hydrochloric Acid
HDV	Heavy Duty Vehicles
HF	Hydrofluoric Acid
HFCs	Hydrofluorocarbons
Hg	Mercury
HGV	Heavy Goods Vehicle
HHRA	Human Health Risk Assessment
HHRAP	Human Health Risk Assessment Protocol
HIA	Health Impact Assessment
HoPI	Habitat of Principal Importance
HRA	Habitat Regulations Assessment

HSE	Health and Safety Executive
HUDU	Healthy Urban Development Unit
IAQM	Institute of Air Quality Management
ID	Induced draught
IED	Industrial Emissions Directive (2010/75/EU)
IEMA	Institute of Environmental Management Assessment
IES	Institute of Environmental Science
IIP	Illumination Impact Profile
ILP	Institution of Lighting Professionals
IMPACT	International Health Impact Assessment Consortium
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
km	Kilometres
LAQM	Local Air Quality Management
LDP	Local Development Plan
LDV	Light Duty Vehicles
LED	Light-Emitting Diode
LEZ	Low Emission Zone
LNR	Local Nature Reserve
LOAEL	Lowest Observed Adverse Effect Level
LPA	Local Planning Authority
LSOA	Lower Super Output Area
lux	Luminous flux per unit area (equal to one lumen per square metre)
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Sites
m	Metres
MCC	Manual Classified Counts
MCERTS	The Environment Agency's Monitoring Certification Scheme for environmental permit holders
MCR	Maximum Continuous Rating
MIOA	Member of the Institute of Acoustics
Mn	Manganese

MVHR	Mechanical Ventilation and Heat Recovery
MW	MegaWatts (10 ⁶ Watts)
N ₂ O	Nitrous Oxide
NAMN	National Ammonia Monitoring Network
NF ₃	Nitrogen Trifluoride
NGR	National Grid Reference
NH ₃	Ammonia
Ni	Nickel
NIA	Net Internal Area
NMP	Noise Management Plan
NMR	National Monuments Record
NNR	National Nature Reserves
NO	Nitric Oxide
NO ₂	Nitrogen dioxide
NOAEL	No Observed Adverse Effect Level
NOC	Normal Operating Condition
NO _x	Nitrogen oxides
NPPF	National Planning Policy Framework.
NPSE	Noise Policy Statement for England
NRW	Natural Resources Wales
NSR	Noise Sensitive Receptor
NTF	National Transfer Format
O ₂	Oxygen
ONS	Office for National Statistics
OS	Ordnance Survey
OTNOC	Other Than Normal Operating Conditions
PAH	Polycyclic Aromatic Hydrocarbons
PAS	Publicly Available Standard
Pb	Lead
PC	Process Contribution
PCBs	Polychlorinated biphenyls
PCDD/Fs	Polychlorinated dibenzo-p-dioxins and dibenzofurans

PEC	Predicted Environmental Concentrations
PEDW	Planning and Environmental Decisions Wales
PEP	Project Environmental Plan
PERA	Preliminary Environmental Risk Assessment
PFC _s	Perfluorocarbons
PHE	Public Health England
PHW	Public Health Wales
PINS	Planning Inspectorate
POP(s)	Persistent organic pollutant(s)
PPG	Pollution Prevention Guidance
PPS	Planning Policy Statement
PPV	Peak Particle Velocity
PPW	Planning Policy Wales
PTAL	Public Transport Accessibility Level
PWS	Potential Wildlife Sites
RCP	Representative Concentration Pathway
RICS	Royal Institution of Chartered Surveyors
SAC	Special Area of Conservation
Sb	Antimony (Sb)
SCR	Selective Catalytic Reduction
SF ₆	Sulphur Hexafluoride
SFRA	Strategic Flood Risk Assessment
SINC(s)	Site(s) of Importance for Nature Conservation
SNCR	Selective Non-Catalytic Reduction
SO ₂	Sulphur Dioxide
SOAEL	Significant Observed Adverse Effect Level
SPA	Special Protection Area
SPD	Supplementary Planning Document
SPG	Supplementary Planning Guidance
SPZ	Source Protection Zone
SSSI(s)	Site(s) of Special Scientific Interest
SUDs	Sustainable Drainage Systems

TA	Transport Assessment
TCO _{2e}	Tonnes of Carbon Dioxide Equivalent
TCPA	Town and Country Planning Act
Ti	Thallium
TOC	Total Organic Carbon
TOMPs	Toxic Organic Micropollutants
TPC	Travel Plan Co-ordinator
TVIA	Townscape and Visual Impact Assessment
UNFCCC	United Nations Framework Convention on Climate Change
V	Vanadium
VES	Voluntary Environmental Statement
VOC	Volatile Organic Compounds
VoGC	Vale of Glamorgan Council
WFD	Waste Framework Directive (2008/98/EC)
WHO	World Health Organisation
WID	Waste Incineration Directive
WIMD	Welsh Index of Multiple Deprivation
WPD	Western Power Distribution
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility
ZTVI	Zone of Theoretical Visual Influence