

ENERGY STATEMENT



BENNET COURT, READING

DV5 COLTHAM (READING) LIMITED

Issued by:

Engineering Services Consultancy Ltd

Griffin House, 19 Ludgate Hill, Birmingham, B3 1DW

T: 0121 214 8998 www.escuk.com

Issue date: **06/02/2023**

ENERGY STATEMENT

BENNET COURT, READING
DV5 COLTHAM (READING) LIMITED

OUR PROJECT REF: ESC1870

ENGINEERING SERVICES CONSULTANCY LTD

Griffin House, 19 Ludgate Hill, Birmingham, B3 1DW

Tel: 0121 214 8998
Email: info@escuk.com
Web: www.escuk.com



REV	DATE	ISSUED BY
R1	06 February 2023	James Tickle

CONTENTS

EXECUTIVE SUMMARY	3
INTRODUCTION	4
CONTEXT	4
SITE LOCATION	4
PROPOSED DEVELOPMENT	5
POLICY AND LEGISLATION	6
NATIONAL	6
LOCAL	7
DEVELOPMENT AIMS	8
ENERGY CONSUMPTION OBJECTIVES	9
ENERGY	10
APPROVED DOCUMENT L2A (2021), BUILDING REGULATIONS.....	11
LOW & ZERO CARBON TECHNOLOGY STUDY	12
AVAILABLE TECHNOLOGIES	12
APPROPRIATE TECHNOLOGIES	17
BREEAM 2018	19
SUMMARY	20
CONCLUSION	21
APPENDIX A – BRUKL.....	22
APPENDIX A – EPC	27

EXECUTIVE SUMMARY

The Energy Statement supports the detailed planning application for the construction of the new industrial building at Bennets Court, Reading.

Assessment was required to assess the buildings' compliance with Building Regulations L2 and policy CC2 & CC4 of the Reading Borough Local Plan (2019). The Policy's sets out a number of ways in which development should be designed and constructed from an energy and sustainability point of view. The policy does not prescribe a percentage of energy to be generated by LZC technology, it does refer to the need to comply with BREEAM Excellent.

However, there is a clear policy expectation that some form LZC solution should be incorporated into new development schemes, unless unviable, to contribute to the overall carbon reduction target in policy reducing the city's carbon footprint.

To comply with Policy CC2 the current proposal will achieve a BREEAM Outstanding rating.

To comply with Policy CC4 the current proposal for the scheme is improved construction and air tightness along with the introduction ASHPs and Photovoltaics to be incorporated to offset the 100% of the regulated energy (regulated energy at PC) consumption.

The current proposal for the scheme is for ASHPs and Photovoltaics to be incorporated to offset the 100% of the regulated energy (regulated energy at PC) consumption.

Please refer to Appendix A for the planning stage BRUKL and Appendix B for the planning stage EPC which archives 9 Credits under BREEAM 2018 ENE01 and hence the requirements for Outstanding within the Energy Credit.

INTRODUCTION

CONTEXT

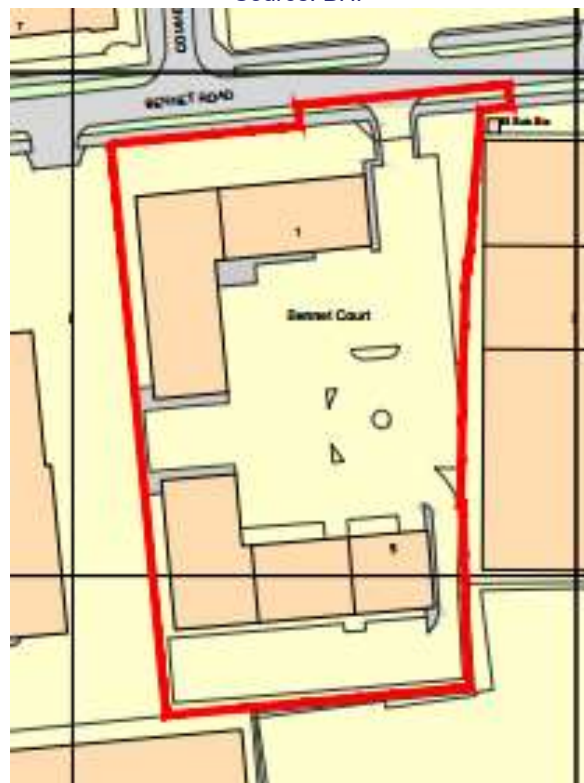
Sustainable development has been defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The Energy consumption of the building is a key part of this.

The Proposed Development aims to mitigate any negative impacts it might have on the environment whilst maximising efficiencies and opportunities to deliver an intrinsically sustainable building.

SITE LOCATION

The proposed development is a Industrial building at Bennets Court, Reading.

Source: BHP



PROPOSED DEVELOPMENT

The proposed development shall be comprised of:

- 39,420 Sqft warehouse unit with 6,955 Sqft Office.
- Car parking spaces including disabled spaces and vehicle charging spaces
- HGV parking and docking stations



Source: Proposed Site Plan (BHP)

POLICY AND LEGISLATION

NATIONAL

NATIONAL PLANNING POLICY FRAMEWORK

The National Planning Policy Framework (NPPF) was introduced in March 2012 and was revised in July 2021. The NPPF sets out the Government's planning policies for England and how these are to be applied. The framework must be considered when granting planning permission for any new development.

The purpose of the planning system and the NPPF is to help achieve sustainable development by meeting the needs of the present without compromising the ability of future generations to meet their own needs. The NPPF divides sustainable development into three objectives which are both independent and mutually supportive:

- Economic
- Social
- Environmental

These objectives should be delivered through the application and implementation of the NPPF policies. The NPPF aims to drive sustainable development and has been established on the basis of **presumption in favour of a sustainable development**.

CLIMATE CHANGE ACT 2008

The Climate Change Act 2008 was published on 26th November 2008 to:

- Set a target for the reduction of greenhouse gas emissions by 2050.
- Provide a system of carbon budgeting.
- Establish a Committee on Climate Change.
- Establish trading schemes to limit greenhouse gas emissions and encourage activities to reduce or remove greenhouse gases from the atmosphere.
- Reduce domestic waste and encourage recycling.

The Act outlines a target to reduce net UK carbon account by at least 80% by 2050, over the 1990 baseline.

TOWN AND COUNTRY PLANNING ACT 1990

The Town and Country Planning Act was published on 24th May 1990 and consolidates several elements relating to town and country planning.

ENERGY ACT 2013

The Energy Act received Royal Assent on 18th December 2013 and makes provision to:

- Set a decarbonisation target.
- Review the electricity market and encourage low carbon electricity generation or secure supply.
- Establish the Office of Nuclear Regulation.

- Protect the government pipe-line and storage system'
- Ensure domestic supplies of gas and electricity and regulation for consumers.
- Establish energy licencing categories.
- Establish principles for offshore transmission of electricity during a commissioning period.
- Review the integration of smoke and carbon monoxide alarms.

PLANNING AND ENERGY ACT 2008

The Act was adopted on 13th November 2008 and enables local planning authorities to set requirements for energy use and energy efficiency in local plans.

BUILDING REGULATIONS

The Building Regulations set out statutory standards developments are to meet. These standards cover measures including energy efficiency, water efficiency, sanitation, fire safety, sound resistance and ventilation.

Part L of the Building Regulations relates to the conservation of fuel and power. Part L covers energy efficiency and sets out the maximum carbon dioxide occupied buildings are to emit. The current 2021 edition came into effect on 15th June 2022.

LOCAL

READING CCS POLICY 2 & 4

The Plan sets out a vision and a strategy for the sustainable growth of the City. It sets out a framework to guide growth across Reading, in particular addressing the challenges related to climate change, quality of life, delivery of infrastructure, creation of an inclusive economy.

Policy CC2 requires that all major non-residential developments or conversions to residential are required to meet the most up-to-date BREEAM 'Excellent' standards, where possible.

Policy CC4 requires that any development of more than 20 dwellings and/or non[1]residential development of over 1,000 sq m shall consider the inclusion of decentralised energy provision, within the site, unless it can be demonstrated that the scheme is not suitable, feasible or viable for this form of energy provision. Where there is existing decentralised energy provision present within the vicinity of the application site, further developments of 10 dwellings or more or non-residential development of 1,000 sq m or more will be expected to link into the existing decentralised energy network or demonstrate why this is not feasible.

The policy does not prescribe a % of energy to be generated by LZC technology. However, there is a clear policy expectation that some form LZC solution should be incorporated into new development schemes, unless unviable, to contribute to the overall carbon reduction.

DEVELOPMENT AIMS

Following a review of the policies and legislation, the new development aims to:

- Meet the challenges of climate change.
- Prevent and minimise pollution.
- Reduce energy use and greenhouse emissions.
- Supporting the use and development of low carbon technologies.

ENERGY CONSUMPTION OBJECTIVES

Climate change is perhaps the most significant global sustainability issue as it directly impacts all others. Variability in the climate system occurs naturally, however human activity since pre-industrial times has accelerated change.

There has been an unequivocal warming on the global climate system with unprecedented temperature rises since the mid-1950s. Both the atmosphere and oceans have warmed resulting in:

- Rise in the global mean sea level.
- Ocean acidification.
- Altered precipitation levels - wet areas becoming wetter and dry areas becoming drier.
- Increased extremity and frequency of weather and multi-hazard events.
- Changes to ocean salinity.
- Significant ice loss from glaciers, ice sheets and sea ice.
- Reduced snowfall and snow cover.
- Increased permafrost temperatures.

More than half of the observed increase in global average surface temperature from 1951 to 2010 has been caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic influence, largely caused by fossil fuel combustion.

In the UK, communities are becoming increasingly vulnerable to climate change which has resulted in a drive for sustainable development. Having reviewed the policies and consequently established the targets to achieve a sustainable development, the following objectives have been established:

There are a number of policies within the Local Plan that require the Proposed Development to be inherently sustainable, including:

- Policy CC2
- Policy CC4

Following a review of these policies, several energy objectives have been established:

ENERGY

Demand for energy and fuel continues to increase and is driven by increases in urbanisation, globalisation and population growth. However, global awareness of the impact of fossil fuel combustion on climate change and the rise in energy costs is driving the need for alternative fuel sources which do not release greenhouse gases into the earth's atmosphere.

Fossil Fuels are not only one of the major global sources of greenhouse gases but are also finite sources of energy. There has been an increase in demand for renewable energy sources and more efficient technologies following recognition of the need to drive down energy use.

In order to demonstrate compliance with *Building Regulations* and *Local Plan Policy* the Proposed Development will follow the following energy hierarchy:

REDUCE ENERGY DEMAND

The Proposed Development is designed with an enhanced building fabric so that the building's thermal performance is improved. Improved u-values and a low air permeability result in fewer heat and air losses and a reduced need for heating and cooling thereby reducing energy use.

REDUCE ENERGY USE

Energy usage will be reduced through the specification of energy efficient equipment, including LED lighting, efficient heating and cooling systems and automatic controls. The end user will be encouraged to use efficient equipment including energy labelled white goods and office equipment.

USE RENEWABLE OR LOW CARBON TECHNOLOGIES

In accordance with *Local Plan Policy*, low or zero carbon forms of energy generation will be incorporated where practical. The Proposed Development will be designed to include provision for photovoltaic panels and thermal collectors on the roof to provide heating and power.

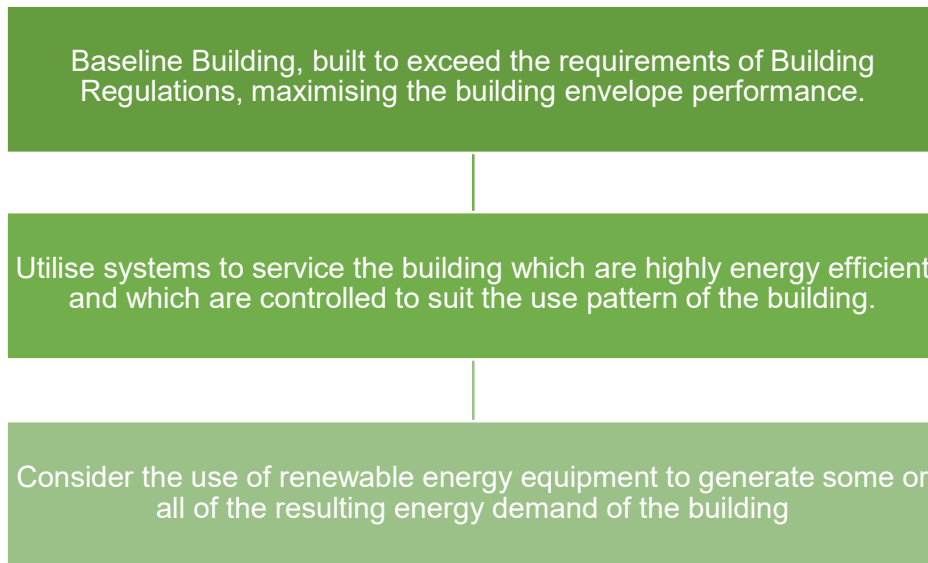
AIR POLLUTION

The following air pollution measures have been specified:

- Low NOx emission heating and hot water systems.
- Low VOC content products, including paints, varnishes & adhesives.
- Efficient refrigerant-using systems.

APPROVED DOCUMENT L2A (2021), BUILDING REGULATIONS

The current building regulations are concerned with 3 key criteria:



1. The amount of carbon dioxide emitted from a building per annum. The amount of carbon dioxide emitted is calculated by an approved Energy Assessor, using approved software tools. Within the approved software, the Energy Assessor creates a virtual building model which is compared against a “Notional Building”. The Notional Building is generated automatically within the accredited software and mimics the physical size, shape, orientation, location, and layout of the virtual model. In order to pass the Criterion One assessment for compliance with ADL2A 2013, the carbon emission of the virtual building must be equal to, or less than, the carbon dioxide emission of the notional building.
2. The performance of the building fabric to ensure that reasonable provision is made to limit heat gains and heat losses. This assesses building fabric U-values and building air permeability to ensure that minimum standards prescribed by the Building Regulations are met. M&E building services must also meet minimum energy efficiency standards.
3. The effect of solar gains during the period of April to September, whether air conditioning is installed or not. The intention is to reduce the need for air conditioning or reduced the installed capacity of air conditioning if present. Again, the virtual building model is compared to a notional building. The model must have a solar heat gain less than or equal to the notional building benchmark.

The principle of the building design is to use as little energy as possible and utilise low or zero carbon energy sources to deliver some of that energy.

This methodology needs a structured and analytical approach to understanding the overall value of each element of design. The first two steps, those of making the building envelope energy efficient and then utilising equipment to service the building which is also very energy efficient, are well proven. However, the results from implementing renewables are variable as many of the technologies are dependent on the variables of weather and of building usage.

LOW & ZERO CARBON TECHNOLOGY STUDY

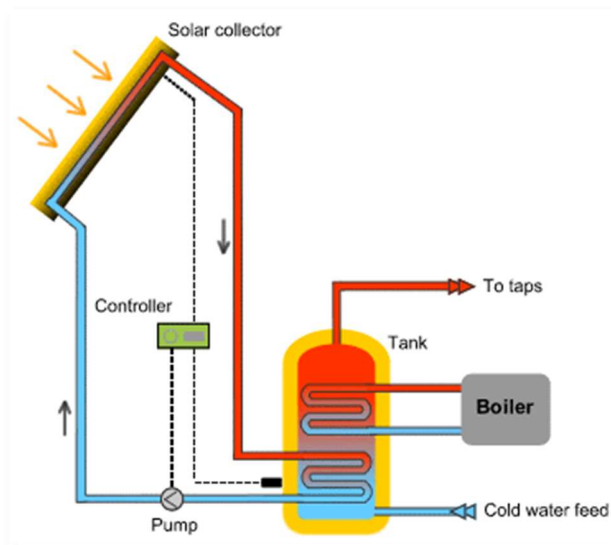
AVAILABLE TECHNOLOGIES

SOLAR HOT WATER

Description

Solar water heating systems use energy from the sun to heat water. A fluid within the wall/roof mounted panel is heated by the sun. The fluid is then used to heat water.

There are two types of collectors available: Flat plate & Evacuated tube



Advantages

Government Renewable Heat Incentive payments. Relies on a natural source (the sun).

Low maintenance.

Disadvantages

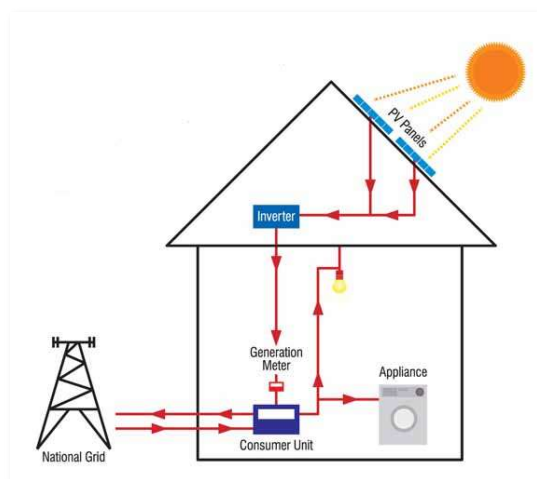
Panels ideally need to face South and at an incline of 30° to the horizontal.

The system must be unshaded.

PHOTOVOLTAICS (PV)

Description

Photovoltaic (PV) systems convert energy from the sun into electricity through semi-conductor cells, connected together in mounted modules.



Advantages

Panels can be incorporated into the building. Feed in Tariff payments.

Relies on a natural source (the sun).

Low maintenance. Silent in operation. No emissions.

Disadvantages

PV panels ideally need to face South and at an incline of 30° to the horizontal.

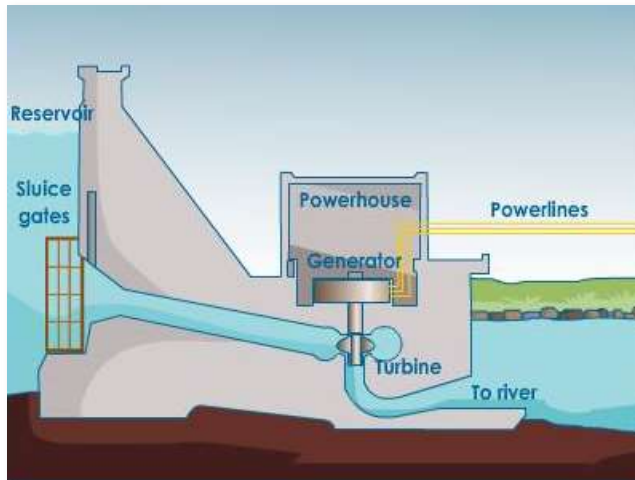
The system must be unshaded.

Amount of energy generated is dependent upon the daylight availability.

HYDRO POWER

Description

Hydro power is the process of using river water to generate electricity. Water is used to drive a turbine to generate electricity.



Advantages

Government Feed in Tariff payments.

Surplus energy can be sold to the grid.

Low running and maintenance costs.

Disadvantages

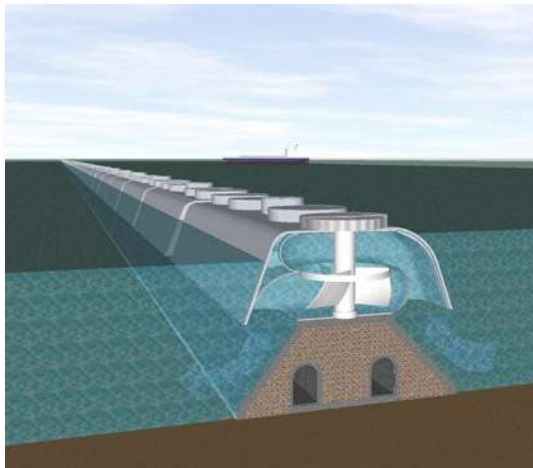
Installation is expensive.

Very site specific – need an adequate water supply all year round.

TIDAL & WAVE POWER

Description

Tidal/wave power is the process of using tidal waves to generate electricity. Water is used to drive a turbine to generate electricity.



Advantages

Government Feed in Tariff payments.

Surplus energy can be sold to the grid.

Low running and maintenance costs.

The tide moves a huge amount of water each day and has the potential to produce a lot of energy.

Disadvantages

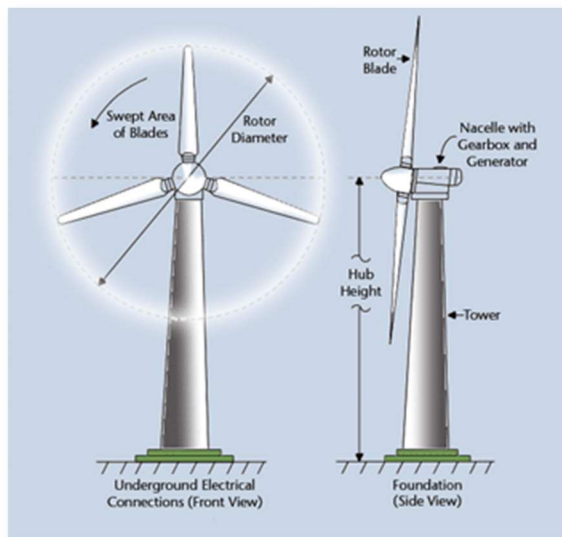
Installation is expensive.

Very site specific – requires a tidal location.

WIND TURBINES

Description

Wind turbines harness the power of the wind to generate electricity through a vertical or horizontal axis propeller which harnesses the kinetic energy in wind and converts it to electrical power through a generator. Requires an average wind speed greater than 5m/s according to CIBSE TM 38. (Refer to <https://www.rensmart.com/Maps> to find the average wind speed for the site.)



Advantages

Wind is free.

Surplus energy can be sold to the grid.

Extremely beneficial in exposed or coastal sites.

Disadvantages

Highly dependent on the speed of the wind at the site of the turbine.

Wind speed is dependent upon location within the UK and nearby obstructions.

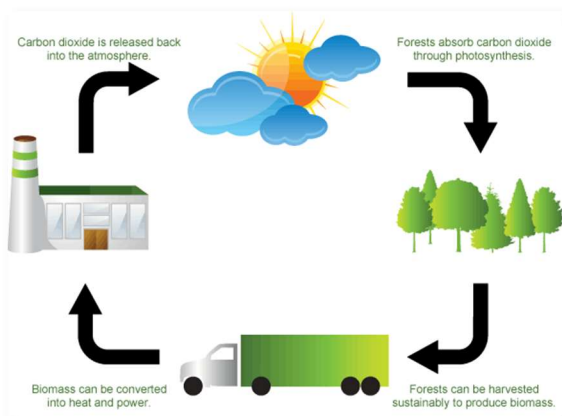
Very visible. High noise levels.

Creates a flickering shadow.

BIOMASS

Description

Wood is burned to provide heat to either a single room, a central heating system or to heat water.



Advantages

May be eligible for Renewable Heat Incentives.

Affordable fuel.

Disadvantages

Wood is renewable but trees take a longer time to grow than to burn.

CO2 emitted when wood is burned.

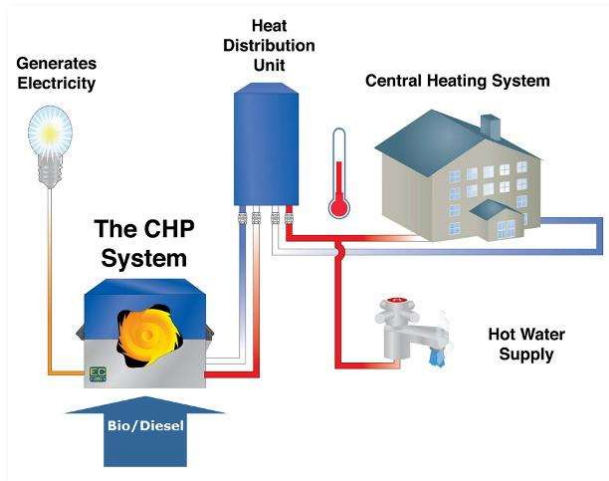
Requires regular deliveries of wood pellets.

The chimney must be carefully considered as it is generally significantly taller than the building.

COMBINED HEAT AND POWER (CHP)

Description

A CHP system generates heat and electricity simultaneously through an internal combustion engine that drives an electrical alternator.



Advantages

Electricity generated as a by-product of heat.

Can burn a variety of fuels, such as natural gas, diesel oil, or biofuels such as bioethanol.

Feed in Tariff payments.

Easy installation.

Cheap maintenance costs.

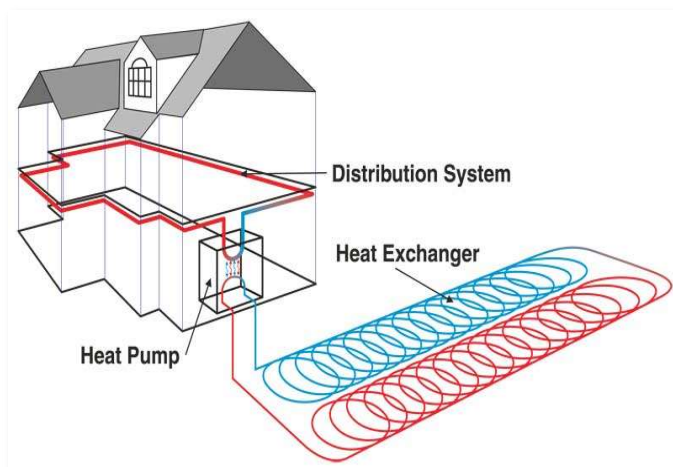
Disadvantages

Typically powered by mains gas or LPG.

GROUND SOURCE HEAT PUMPS

Description

Ground source heat pumps extract heat from the ground via pipes buried in the ground. The pipes contain a fluid which is heated, this heat can then be used for heating or hot water.



Advantages

Government Renewable Heat Incentive payments.

Can be used throughout the entire year as the ground remains at a consistent temperature.

Disadvantages

The ground must be suitable for digging a trench or boreholes.

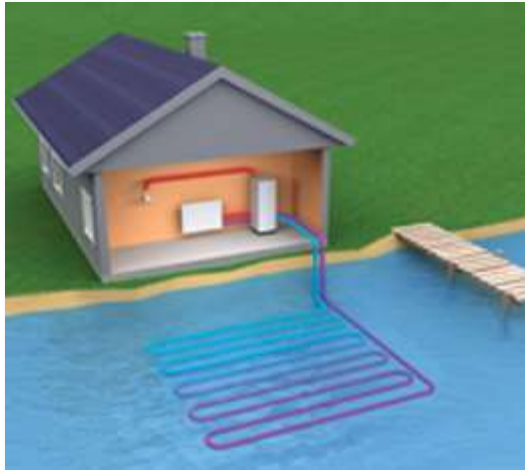
Require regular maintenance.

Initial installation can be expensive.

WATER SOURCE HEAT PUMPS

Description

Water source heat pumps absorb heat from a water source which can then be used for heating or hot water.



Advantages

Government Renewable Heat Incentive payments.

High rate of heat transfer.

Disadvantages

Require regular maintenance.

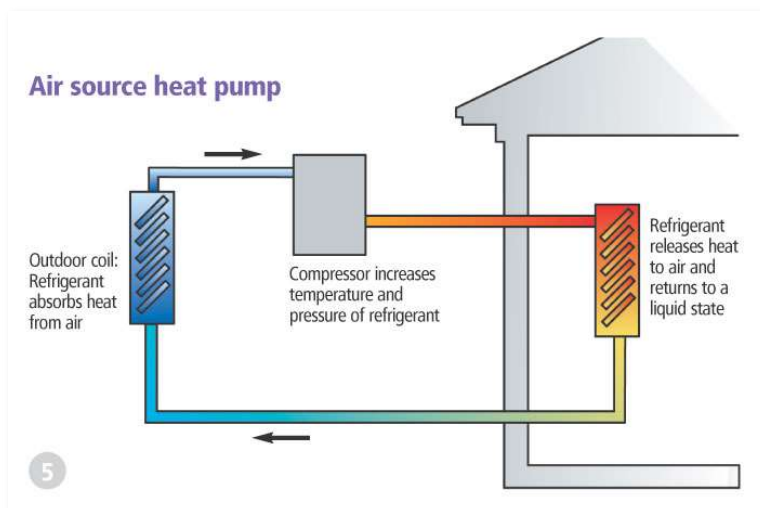
The ground must be suitable for digging a trench or boreholes.

Site specific as it requires an adequate water source.

AIR SOURCE HEAT PUMPS

Description

Air source heat pumps absorb heat from the outside air which can then be used for heating or hot water.



Advantages

Government Renewable Heat Incentive payments.

Relatively low capital costs.

Disadvantages

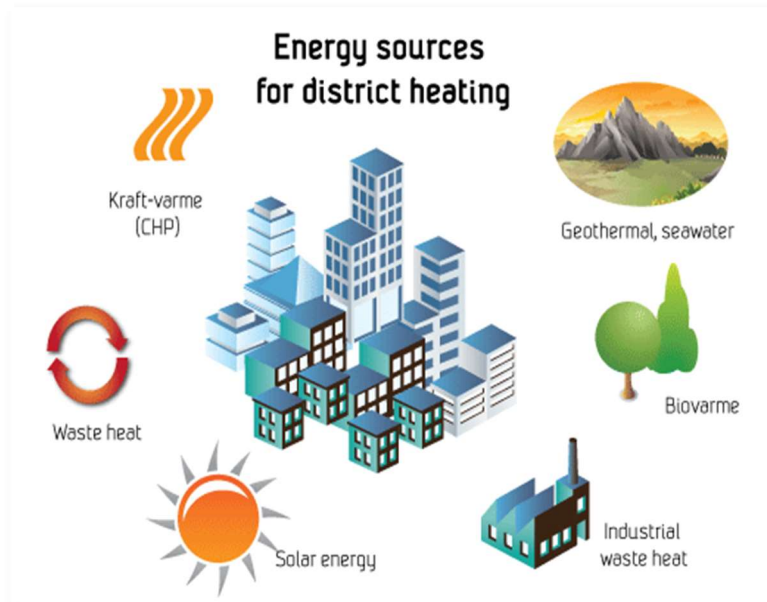
Require regular maintenance.

Requires additional plant space.

COMMUNITY/DISTRICT HEATING

Description

A centralised heating network supplies heat from a central source to businesses/homes through a network of pipes carrying hot water.



Advantages

Cost-effective.

Government funding often available.

Disadvantages

Expensive installation.

Often requires existing network to allow a connection.

APPROPRIATE TECHNOLOGIES

The breakdown below summarises the technologies which could be considered feasible for use on this development:

APPROPRIATE LZC TECHNOLOGY INFORMATION

Photovoltaics (PV)

The building has large roof spaces available for installation. Should a building not achieve compliance with Building Regulation's ADL2A then implementing this technology is highly recommended.

Carbon Emissions associated with Electrical usage within the building will be reduced due to on site generation.

Air Source Heat Pumps (ASHP)

Heating & Cooling to the offices will be provided via ASHPs.

EXCLUDED TECHNOLOGIES

A number of technologies have been excluded due to location or resource availability; these have been summarised in the table below:

EXCLUDED LZC TECHNOLOGY INFORMATION

Hydro Power

There is no suitable water source to allow for a hydroelectric power installation.

Tidal & Wave Power

There is no suitable water source to allow for a tidal or wave power installation.

Ground Source Heat Pumps

Ground source heat pumps can be suitable for this development; however, capital cost will be greater than air source heat pumps. As the price difference between electricity and gas fuel can sometimes be a factor of three, payback will potentially be very long.

Solar Thermal Collectors

The nature of the building will benefit from the efficient generation of hot water. The usage profile of a warehouse is generally high-water usage.

Water Source Heat Pumps

There is no suitable water source to enable the installation of a water source heat pump system.

Wind Turbines

The average wind speed shown in RenSMART's wind map show it is generally below or equal to 5.0 m/s. Wind turbines require average wind speeds greater than 5.0 m/s to generate meaningful amount of energy.

Biomass

The buildings are speculative and assumed to have no industrial space heating and/or cooling applied. However, spare ducts shall be provided within site for future connections onto any future decentralised energy networks

Combined Heat and Power

The buildings are speculative and assumed to have no industrial space heating and/or cooling applied. However, spare ducts shall be provided within site for future connections onto any future decentralised energy networks.

Community / District Heating

The buildings are speculative and assumed to have no industrial space heating and/or cooling applied for this report. However, spare ducts shall be provided within site for future connections onto any nearby district heating network.

BREEAM 2018

The development is targeting BREEAM Outstanding with 9 credits being achieved under ENE01 Energy credits.

Energy performance - Building score

Heating and cooling demand energy performance ratio (EPRdem)	0.313
Primary consumption energy performance ratio (EPRpc)	0.327
CO ₂ -eq energy performance ratio (EPRco2-eq)	0.327
Overall building energy performance ratio (EPRnc)	0.967
Total BREEAM credits achieved	9.0

Calculate score

Clear

SUMMARY

The development aims to mitigate any negative impacts it might have on the environment and minimise and consequential risks whilst maximising efficiencies and opportunities to deliver an intrinsically sustainable building.

The Proposed Development has established the following aims:

- Meet the challenges of climate change.
- Conserve and enhance the natural environment.
- Prevent and minimise pollution.
- Reduce energy use and greenhouse emissions.
- Comply with Policy CC2 & CC4

Energy consumption reduction objectives have been established to meet the long term aims and include actions throughout the planning, design, construction and operation phases of the development.

The objectives will be delivered through the implementation of:

- Improved Air Permeability
- Improved U Values
- LED Lighting with Intelligent Lighting Control
- ASHP's to serve the office areas
- 175m² Photovoltaic Panels generating circa. 31,528kWh/annum

The result of the above is an EPC A+ rated building with 100% of regulated energy offset via the Photovoltaic Panels. Please refer to Appendix A&B for the BRUKL & EPC.

CONCLUSION

Sustainable development aims to meet the needs of the present without compromising the ability of future generations to meet their own needs.

The Proposed Development aims to mitigate negative impacts and target opportunities relating to the environment. The development has been designed to incorporate several sustainability measures to address the aims and objectives established so that an intrinsically sustainable building is delivered.

With any new building there will be unavoidable negative impacts resulting from energy use however the planning, design, construction and operation of the Proposed Development has been and will be managed so that the effect is minimised and mitigated where possible.

The development complies with Policy CC2 (Sustainable Design & Construction) & CC4 (Decentralised Energy).

To comply with Policy CC2 the current proposal will achieve a BREEAM Outstanding rating.

To comply with Policy CC4 the current proposal for the scheme is improved construction and air tightness along with the introduction ASHPs and Photovoltaics to be incorporated to offset the 100% of the regulated energy (regulated energy at PC) consumption.

APPENDIX A – BRUKL

BRUKL Output Document



Compliance with England Building Regulations Part L 2021

Project name

Shell and Core

ESC1870 - Warehouse Excluded - EPC A+ As designed

Date: Wed Jan 25 15:31:07 2023

Administrative information

Building Details

Address: Bennet Court, Reading, RG2

Certifier details

Name: James Tickle

Telephone number: 0121 214 8998

Address: Griffin House, 19 Ludgate Hill, Birmingham, B3 1DW

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.17

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.17

BRUKL compliance module version: v6.1.c.0

Foundation area [m²]: 372.45

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	4.64
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	-0.3
Target primary energy rate (TPER), kWh/m ² .annum	48.92
Building primary energy rate (BPER), kWh/m ² .annum	-8.33
Do the building's emission and primary energy rates exceed the targets?	BER <= TER BPER <= TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	U _a -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.25	0.26	11000000:Surf[1]
Floors	0.18	0.18	0.18	20000000:Surf[0]
Pitched roofs	0.16	-	-	No Pitched roofs in building
Flat roofs	0.18	0.18	0.18	11000000:Surf[0]
Windows** and roof windows	1.6	1.5	1.5	RM000001:Surf[0]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors [^]	1.6	-	-	No Personnel doors in building
Vehicle access & similar large doors	1.3	-	-	No Vehicle access doors in building
High usage entrance doors	3	-	-	No High usage entrance doors in building
U _a -Limit = Limiting area-weighted average U-values [W/(m ² K)] U _a -Calc = Calculated area-weighted average U-values [W/(m ² K)] U _i -Calc = Calculated maximum individual element U-values [W/(m ² K)] * Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows. ** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position. ^ For fire doors, limiting U-value is 1.8 W/m ² K NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.				

Air permeability	Limiting standard	This building
m ³ /(h.m ²) at 50 Pa	8	3

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	<0.9

1- Electric Panel Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.81	-	0	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

2- VRF & MVHR

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4	5	0	1.5	0.75
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

"No HWS in project, or hot water is provided by HVAC system"

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1			
WC FF	-	-	0.4	-	-	-	-	-	-	-	-	N/A
WC GF	-	-	0.4	-	-	-	-	-	-	-	-	N/A
WC GF	-	-	0.4	-	-	-	-	-	-	-	-	N/A

Shell and core configuration

Zone	Assumed shell?
Circulation FF	NO
Cleaner FF	NO
Cleaners GF	NO
Office Meeting Boardroom FF	NO
Office Meeting FF	NO
Office Open FF	NO
Reception	NO

Shell and core configuration

Zone	Assumed shell?
Staircase Offices	NO
Staircase Fire	NO
WC FF	NO
WC GF	NO
WC GF	NO

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
Circulation FF		110	-	-
Cleaner FF		110	-	-
Cleaners GF		110	-	-
Office Meeting Boardroom FF		110	-	-
Office Meeting FF		110	-	-
Office Open FF		110	-	-
Reception		110	110	0.982
Staircase Offices		110	-	-
Staircase Fire		110	-	-
WC FF		110	-	-
WC GF		110	-	-
WC GF		110	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Office Meeting Boardroom FF	NO (-65.8%)	NO
Office Meeting FF	NO (-72%)	NO
Office Open FF	NO (-80.3%)	NO
Reception	NO (-79.4%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Floor area [m ²]	753.2	753.2		Retail/Financial and Professional Services
External area [m ²]	2130.2	2160.6		Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON		Offices and Workshop Businesses
Infiltration [m ³ /hm ² @ 50Pa]	3	5		General Industrial and Special Industrial Groups
Average conductance [W/K]	510.3	632.32	100	Storage or Distribution
Average U-value [W/m ² K]	0.24	0.29		Hotels
Alpha value* [%]	25.02	10		Residential Institutions: Hospitals and Care Homes
				Residential Institutions: Residential Schools
				Residential Institutions: Universities and Colleges
				Secure Residential Institutions
				Residential Spaces
				Non-residential Institutions: Community/Day Centre
				Non-residential Institutions: Libraries, Museums, and Galleries
				Non-residential Institutions: Education
				Non-residential Institutions: Primary Health Care Building
				Non-residential Institutions: Crown and County Courts
				General Assembly and Leisure, Night Clubs, and Theatres
				Others: Passenger Terminals
				Others: Emergency Services
				Others: Miscellaneous 24hr Activities
				Others: Car Parks 24 hrs
				Others: Stand Alone Utility Block

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	14.58	13.94
Cooling	2.56	2.82
Auxiliary	5.51	10.8
Lighting	7.73	7.13
Hot water	4.13	3.7
Equipment*	40.01	40.01
TOTAL**	34.52	38.39

* Energy used by equipment does not count towards the total for consumption or calculating emissions.

** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	41.87	5.7
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>41.87</i>	<i>5.7</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	133.55	151.7
Primary energy [kWh/m ²]	-8.33	48.92
Total emissions [kg/m ²]	-0.3	4.64

HVAC Systems Performance									
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	78.7	34	5.9	3	6.3	3.71	3.18	4	5
Notional	79.8	54.7	8	3.3	12.5	2.78	4.63	----	----
[ST] Central heating using air distribution, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	284.2	0	74	0	0.5	1.07	0	0.81	0
Notional	279.3	0	55	0	0.5	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	0	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

APPENDIX A – EPC

Energy Performance Certificate Non-Domestic Building



Bennet Court
Address 2
Address 3
Address 4
Reading
RG2

Certificate Reference Number:
2760-7372-9559-9693-1555

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient

A+

-1

This is how energy efficient the building is.

Net zero CO₂ emissions

A 0-25

B 26-50

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Air Conditioning
Total useful floor area (m ²):	753.165
Building complexity:	Level 5
Building emission rate (kgCO ₂ /m ² per year):	-0.3
Primary energy use (kWh/m ² per year):	-8.33

Benchmarks

Buildings similar to this one could have ratings as follows:

13 If newly built

51 If typical of the existing stock

Administrative information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software: Virtual Environment v7.0.17 using calculation engine ApacheSim v7.0.17

Property Reference: UPRN-000000000000

Assessor Name: James Tickle

Assessor Number: LCEA008531

Accreditation Scheme: CIBSE Certification Limited

Assessor Qualifications: NOS5

Employer/Trading Name: Trading Name

Employer/Trading Address: Trading Address

Issue Date: 25 Jan 2023

Valid Until: 24 Jan 2033 (unless superseded by a later certificate)

Related Party Disclosure: Not related to the owner

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report: 4993-9146-3391-8405-9311

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by CIBSE Certification Limited. You can obtain contact details of the Accreditation Scheme at www.cibsecertification.com.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. For further information about how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document and advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property - whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.