

Land adjacent to
2 Coleridge Road E8 8EJ
ENERGY STATEMENT

Consultant Report

23 April 2026

PROJECT REF:	AJP-119
CLIENT:	Dan & Carolyn Schuster-Woldan
LOCAL AUTHORITY:	London Borough of Haringey
BUILDING REGULATIONS:	Part L1 (2021)
CO ₂ EMISSIONS REDUCTION:	thirty five percent (35%)

1	INTRODUCTION	5
1.1	Brief Development Overview	5
2	EXECUTIVE SUMMARY	6
3	ENERGY HIERARCHY	8
3.1	Be Lean	8
3.1.1	Energy efficiency first	8
3.1.1.1	Main Fabric Efficiency Improvements	8
3.1.1.2	Other areas for improvement:	9
3.2	Be Clean	9
3.3	Be Green	9
3.3.1	What are Low Carbon sources	9
3.3.2	What are Renewable Energy Sources?	9
3.4	Be Seen	9
4	COOLING AND OVERHEATING	9
4.1	The Cooling hierarchy	10
4.1.1	Minimising internal heat generation through energy efficient design	10
4.1.2	Reducing the amount of heat entering the building in summer	10
4.1.3	Use of thermal mass and high ceilings to manage the heat within the building	10
4.1.4	Passive ventilation	10
4.1.5	Mechanical ventilation	10
5	METHODOLOGY	10
5.1	Energy Assessment	10
5.1.1	Stage 1 – Baseline	11
5.1.1.1	Part L1	11
5.1.2	Stage 2 – Be Lean	11
5.1.2.1	Domestic L1a fabric enhancements	11
5.1.2.2	Domestic heating enhancements (with exceptions of heat pumps)	12
5.1.3	Stage 3 – Be Clean	12
5.1.3.1	Domestic heating enhancements	12
5.1.4	Stage 4 – Be Green	12
5.1.4.1	Domestic heating enhancements	12
6	APPRAISAL	13
6.1	District heating networks for Land adjacent to 2 Coleridge Road E8 8EJ	13
6.1.1	London Heat Map	13
6.1.2	Local Authorities Strategic Plans	13
6.1.3	Projects method of address the potential	13
6.2	Possible Options Summary for Land adjacent to 2 Coleridge Road E8 8EJ	14
6.2.1	Potential Options	15

6.2.1.1	Air Sourced Heat Pumps	15
6.2.1.2	Photovoltaic Cells	15
7	FINDINGS	15
7.1	Preferred options for Land adjacent to 2 Coleridge Road E8 8EJ	15
7.2	Carbon Dioxide Emissions by Stage	15
7.3	Project Energy Required by Stage	15
8	CONCLUSION	16
A	APPENDIX – SUPPORTING DETAILS FROM SAP CALCULATIONS	17
A.1	Solar PV Feasibility Table	17
A.2	Carbon Dioxide Reductions after each stage of the hierarchy	17
A.3	TFA, DER, TER, DFEE & TFEE for each domestic unit	17
A.3.1	Baseline	17
A.3.2	Be Lean (after energy reductions)	17
A.3.3	Be Clean (after addressing the heating systems)	17
A.3.4	Be Green (after addition of low or zero carbon technology)	17
A.4	Project energy requirements after each stage of the hierarchy	18
A.5	Project energy demand details by stage	18
A.5.1	Baseline	18
A.5.2	Be Lean (after energy reductions)	18
A.5.3	Be Clean (after addressing the heating systems)	18
A.5.4	Be Green (after addition of low or zero carbon technology)	18
B	SUSTAINABILITY CRITERIA SPECIFIC TO THIS PROJECT	19
B.1	BRE Internal Water Usage Calculator	19
B.2	BRE Green Guide Rating & Associated materials breakdown	20
B.2.1	METSEC Wall	20
B.2.2	Brick faced cavity wall	21
B.2.3	PVCu Double Glazed windows	22
B.2.4	Metal composite windows	23
B.2.5	Warm Deck Flat Roof	24
B.2.6	Pitched Roof Timber Construction	25
B.3	50% Timber Accredited Sources Compliance	26
B.4	Zero Ozone Depletion and toxicity compliance	29
C	RENEWABLE ENERGY REVIEW CRITERIA	40
C.1	WIND TURBINES	40
C.2	SOLAR HOT WATER	41
C.3	SOLAR PV (Photovoltaic)	41
C.4	HEAT PUMPS	42
C.4.1	Ground Source Heat Pumps (GSHP)	42
C.4.2	Air source heat pumps (ASHP)	43
C.4.3	Air to Water Heat Pump	43
C.4.4	Air to Air Heat pumps	43
C.4.5	Exhaust Air Heat Pump	44
C.4.6	Water sourced heat pumps (WSHP)	44
C.5	BIOMASS	44

1 Introduction

This report will investigate the various options for the provision of decentralised and renewable or low carbon energy sources (LZCs) in relations to the proposed development at Land adjacent to 2 Coleridge Road E8 8EJ. It will discuss the appropriate options available to meet London Borough of Haringey requirements

This Energy Assessment follows the guidelines set out in the Lord Mayor's Energy Strategic Specifically the document

ENERGY PLANNING Greater London Authority guidance on preparing energy assessments (June 2022)
the current version of the London Plan ratified June 2022

1.1 Brief Development Overview

This Energy Strategy Statement seeks to support the Full Planning Application, and this project will create one dwelling house with a GIA of 140.11 m²

Whilst there is a tangential link there is a complete difference between Energy savings and CO₂ reduction; however, for completeness I have dealt with both in this document:

- The CO₂ reductions are defined by the Dwelling Emission Rate (DER) x Total Floor Area (TFA) and this is what is identified in the executive summary. The DER takes account of factors such as NO_x emissions and the cost of the heating source (mains gas, electricity, etc.) used
- The Energy Savings are related to use of Energy and are defined only by the kWh/year required for the asset to function correctly

The Executive Summary details, in the top part, the hierarchical CO₂ savings both in tonnes per year and percentage against the baseline – the last line shows the Local Authority target savings

The tables in [here](#) show in more detail how the CO₂ reductions have been obtained for each level in the hierarchy – the details of which can be found in the SAP calculations whilst the full details will be found in the full SAP

The tables [here](#) are only applicable to the Energy requirements/reduction for this project

2 Executive Summary

A total CO₂ reduction of 82.60% shows the project has exceeded the minimum thirty five percent (35%) requirement of London Borough of Haringey

The whole project	Regulated Carbon dioxide savings	
	(Tonnes CO ₂ per annum)	Savings (%)
Savings from energy demand reduction	1.08	61.45%
Savings after addressing heating	0.00	0.00%
Savings from low or zero carbon technology	0.37	21.15%
Total Cumulative Savings	1.45	82.60%
Local Authority Target Minimum Savings (whole project)	0.61	35.00%

Table 2: Regulated carbon dioxide savings after each stage of the energy hierarchy

The whole project	Annual (Tonnes CO ₂)	Percentage savings	Cumulative CO ₂ (Tonnes x 30 years)
London Plan Zero Carbon minimum savings target	1.76	100.00%	
Annual shortfall	0.31	Against Zero Carbon	9.16

Table 3: Shortfall in regulated carbon dioxide savings

Domestic units only	LA Price per Tonne (2022 London Plan default £95)	Total Carbon Offset Part L 2021 Payment to LA	GLA Carbon Emission Reporting calculated Payment to LA
Calculated using 2022 London Plan default price	£ 95.00	£ 870.50	£ 871.00

Table 4: Carbon offset calculations

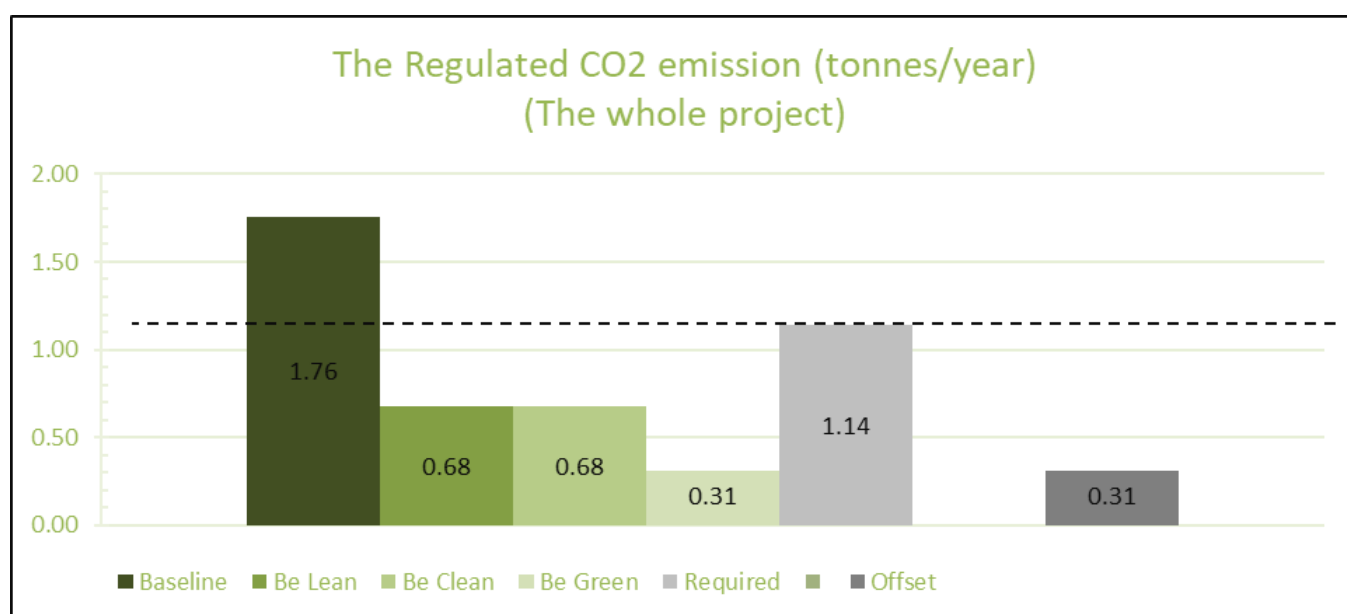


Table 5: Regulated CO₂ emissions for the whole project

Part L1a domestic	Project Energy Required (kWh/year)			% Energy Savings		Energy Generated (kWh/year)
	Regulated	Unregulated	Total	Regulated	Total	Solar PV
Baseline (Proposed = Notional)	11,444.04	3,118.36	14,562.40			0.00
Be Lean (Demand Reductions)	4,577.25	3,118.36	7,695.61	60.00%	47.15%	0.00
Be Clean (District/Communal heat)	4,577.25	3,118.36	7,695.61	0.00%	0.00%	0.00
Be Green (LZC Tech only)	3,527.50	3,118.36	6,645.86	9.17%	7.21%	N/A
Be Green (LZC tech + generated)	1,816.39	3,118.36	4,934.75	24.12%	18.96%	1,711.11
Total Savings				84.13%	66.11%	
	PV as % Regulated Energy Requirement					48.51%
	PV as % Total Energy Requirement					25.75%

Table 6: Project Energy Savings for each stage of the Energy Hierarchy

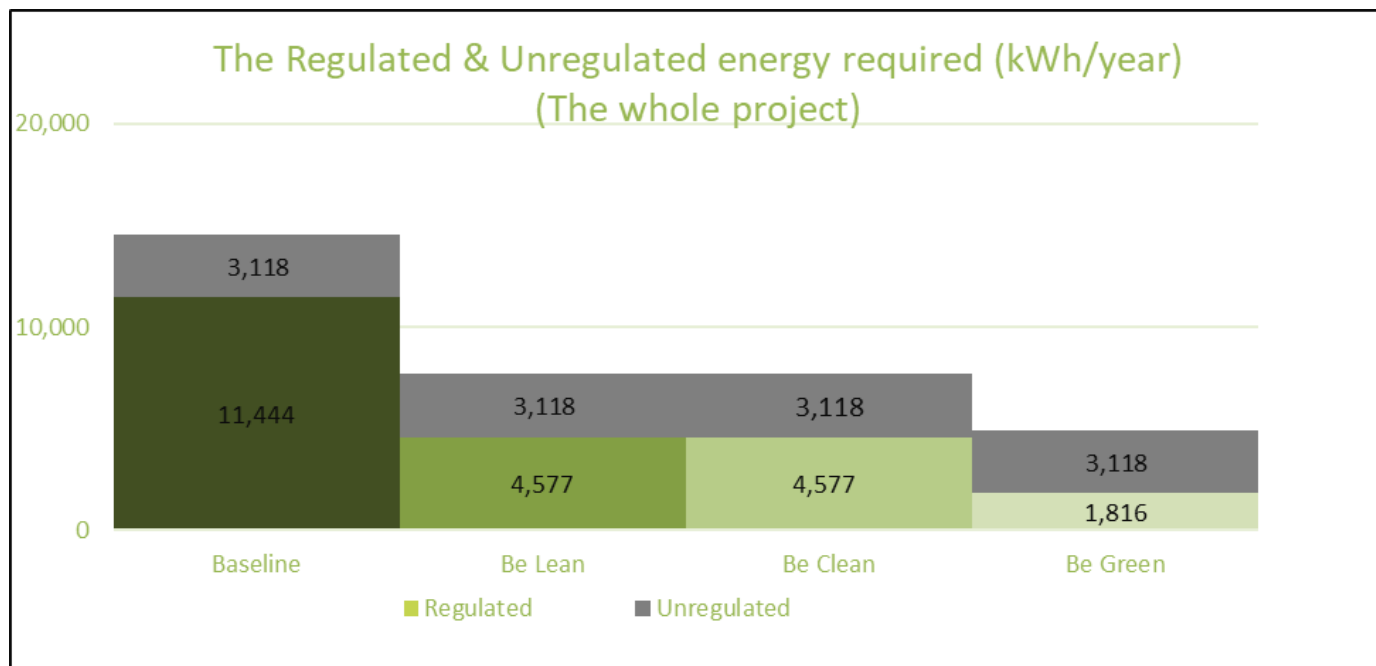


Table 7: Regulated & Unregulated energy required for each stage of the Energy Hierarchy

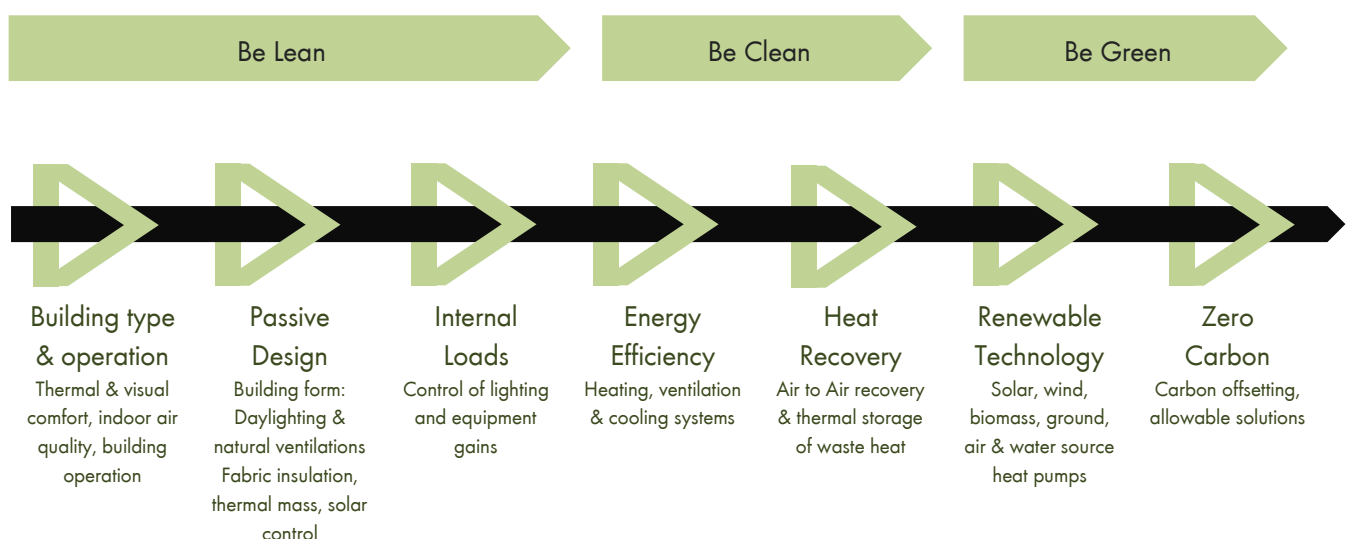
3 Energy Hierarchy

When designing a building, it is advisable to follow an energy hierarchy. The primary aim is to make the building as energy efficient as possible to reduce the demand for energy, and thus the demand of energy from renewable sources.

Building Regulations Part L1 (2021) aims to reduce CO₂ emissions from new buildings by 31% compared to those built to 2013 regulations. This can be achieved by making improvements to the fabric of the building by increasing levels of insulation, increasing air tightness, addressing thermal bridging issues and the use of efficient heating & appliances. CO₂ emissions can be further reduced by using renewable energy sources.

To reduce by thirty five percent (35%) the carbon emissions of the proposed development, the principle is to follow the energy hierarchy

- Be Lean – create an energy efficient building
- Be Clean – address the heating infrastructure (District & Communal heating systems)
- Be Green – include Low or Zero Carbon (LZC) technology to further reduce the efficiency (by convention Heat Pumps are considered LZC technology and Gas Boilers included in Be Lean)



3.1 Be Lean

3.1.1 Energy efficiency first

Before any renewable technologies are considered it is good practice to reduce the overall energy demand of a dwelling by using low energy design techniques

Low energy design involves the consideration and implementation of measures that will increase the dwelling fabric energy efficiency, and it is now standard practice to require major developments to decrease the CO₂ emissions by at least 10% for domestic dwellings and 15% for non-domestic units.

3.1.1.1 Main Fabric Efficiency Improvements

- Increased insulation to main external elements (roof, walls, floor, openings)
- Increase the efficiency of openings (windows, doors, etc.)
- Reduced thermal bridging
- Improved air tightness
- Energy efficient lighting & improved controls (especially important in non-domestic installations)

3.1.1.2 Other areas for improvement:

- Controlled ventilation
- Energy efficiency applications (Cooker, washing machine, fridges, etc.)

By decreasing the total energy demand first, the thirty five percent (35%) CO₂ reduction from LZC sources is also reduced ensuring a smaller LZC installation is required, had these efficiencies not been made

3.2 Be Clean

The largest proportion of energy demand of a typical dwelling is from space and water heating thus when addressing the heating infrastructure, we look at, where appropriate, district heating systems, community heating systems and heating systems. For larger developments planning for future district heating connectivity is either mandatory or highly recommended. It is becoming a standard practice to include discrete heat pump installations as Low Carbon sources and therefore incorporated in the Be Green hierarchy

3.3 Be Green

Include renewable energy and/or Low Carbon sources to further reduce the CO₂ emissions.

3.3.1 What are Low Carbon sources

Low carbon sources are items such as heat pumps, whilst they require a small amount of input energy (carbon generating) they are inherently so efficient the resultant output makes up for the small input – hence low carbon

3.3.2 What are Renewable Energy Sources?

Renewable sources of energy are those which are continually available in the environment. Examples of renewable energy sources are Solar Radiation, Wind, Hydropower, Geo-thermal, biomass and debatably nuclear

Up until now the UK has produced most of its energy needs from the burning of fossil fuels (coal, oil, natural gas). This has led to the depletion of these resources as well as to the production of vast quantities of greenhouse gases, created as these fuels are burnt to provide energy. Renewable energy sources emit no greenhouse gases, or in the case of biomass, are considered as carbon neutral over their lifecycle.

3.4 Be Seen

The Be Seen stage of the energy hierarchy requires monitoring and reporting of the actual operational energy performance of major developments for at least five years to ensure the Design assumptions are met in practice

4 Cooling and Overheating

The development has used the Good Homes Alliance – Overheating in New Homes as basis upon which to set out the design standards. During the design stage of this project the recommendations in GLA Policy 5.9 Overheating and cooling have been reviewed.

Summer overheating (Thermal Comfort) is now handled within Part O and applied to new dwellings within new buildings. For Material Change of Use and extensions to existing buildings, whether or not new dwellings are created, Part O does not apply

4.1 The Cooling hierarchy

Whilst the project will follow and implement a strategy based upon the London Plan cooling hierarchy as this is a planning application the GHA Early-Stage Overheating Risk Tool will be completed and if required CIBSE TM59 / TM49 Overheating dynamic modelling will be performed at RIBA Stage 2 or 3 to ensure the Technical Design is informed

4.1.1 Minimising internal heat generation through energy efficient design

The Design & Access Statement provides the details of how this has been implemented in this project; however, Energy Efficiency has been maximised using high quality insulation, glazing and air tightness achieving at least a 10% reduction in emissions for domestic units and 15% for non-domestic units

4.1.2 Reducing the amount of heat entering the building in summer

Where necessary and practical shading, to avoid summer overheating, has been implemented

4.1.3 Use of thermal mass and high ceilings to manage the heat within the building

Where practical and possible exposed thermal mass has been used to reduce the likelihood of overheating

4.1.4 Passive ventilation

Where practical and possible openable windows, East West orientation of a shallow floorplate, dual aspects etc. have been used

4.1.5 Mechanical ventilation

As a last resort the design will look at mechanical ventilation and include a summer by-pass on any heat recovery system installed

5 Methodology

This report will use the Standard Assessment Procedure (SAP and/or SBEM) as a tool to demonstrate energy requirements for the proposed development. This will give an accurate assessment of the individual dwelling including its size, location, and orientation to assess the total energy demand of the development.

SAP (or SBEM) assessments are done on individual dwellings. Energy usage and reduction for each unit will be calculated and the results summed to provide a site total. These calculations will be performed for each of the models

Decentralised and renewable, or low carbon technologies will be discussed, with a view to securing a reduction of at least thirty five percent (35%) of the total carbon emissions the development to satisfy the requirements of London Borough of Haringey. The advantages and disadvantages for each option will be explored to conclude the most suitable technologies for this development.

Feasible renewable technologies will be assessed in terms of their operational information and suitability. A synopsis will demonstrate the most suitable solutions for the development from a feasibility perspective.

5.1 Energy Assessment

SAP calculates the energy demand for heating, hot water, lighting, pumps, and fans and this considers any reduction in energy use from built form by considering solar gains and efficiency measures such as lighting, insulation, and

the choice of boiler. As considered good practise, the energy requirement of appliances & cooking has been calculated by increasing overall energy use by twenty percent

5.1.1 Stage 1 – Baseline

5.1.1.1 Part L1

The development is modelled so that it meets the minimum requirements of Part L1 (2021) by increasing the efficiency of the various elements using, where relevant and appropriate so that DER = TER, also ensuring DFEE is as close as possible to TFEE and DPER is as close to TPER as possible

When using Heat pumps and SAP 10 the efficiency calculations of heat pumps are complex and therefore the Baseline is set using the Notional values (TER, TPER, TFEE) of the Be Lean stage

5.1.2 Stage 2 – Be Lean

Another model is developed that increases the thermal efficiency of the development, as a minimum for Part L1a, to those detailed in Table 4 Summary of concurrent notional dwelling specifications, from the Part L1 (2021) manual and look to increase the air tightness and thermal bridging

5.1.2.1 Domestic L1a fabric enhancements

Description	Limiting Factor	Notional	Proposed (W/m2K)
Floor	0.18	0.13	0.10
Walls (external)	0.26	0.18	L1a = 0.15
Roof	0.16	0.11	0.10
Psi value calculations	None	Reference values	Recognised Construction Details
Doors	1.60	1.0	1.0
Windows	1.60	1.2	1.2
Rooflights	2.2	1.7	1.7
Air Permeability	8 m3/hm2	5 m3/hm2	4.0 m3/hm2
Ventilations	Natural	Natural	Zehnder ComfoAir 350 - MVHR
Cooling	None	None	None
Low Energy Lights (LED)	75%	80 lm/cW	120 lm/cW
Solar PV	None	Standard calculation	Standard calculation

* Full fill or solid

5.1.2.2 Domestic heating enhancements (with exceptions of heat pumps)

Review the heating infrastructure and assess the impact of various alternative heating systems although the London Plan requires Heat Pumps to be treated as Low or Zero Carbon technology and assessed at the Be Green stage

Description	Notional	Proposed
Primary Heating	250% efficient ASHP	250% efficient ASHP
Primary Controls	Time/temp zoned + weather compensator	Time & temp zoned + weather compensator
Secondary heating	None	Log Burner
Water Heating	From main heating system	From main heating system
WWHRS	None	None

5.1.3 Stage 3 – Be Clean

5.1.3.1 Domestic heating enhancements

There will be no change at Be Clean unless the project is using a Heat Network

5.1.4 Stage 4 – Be Green

5.1.4.1 Domestic heating enhancements

Review the heating infrastructure and assess the impact of various alternative heating systems

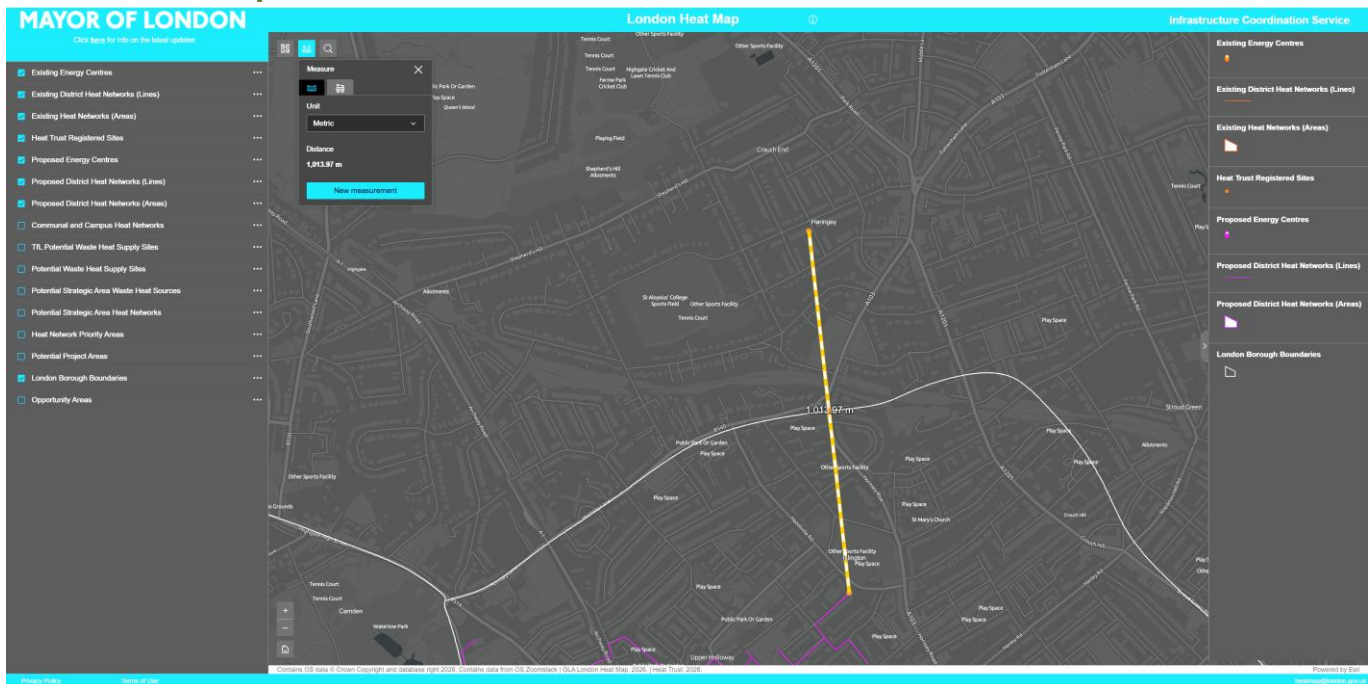
Description	Notional	Proposed
Primary Heating	Heat pump 250% efficient for space & water heating	Air Sourced Heat Pump – Vaillant aroTHERM 5kW + AI, or similar
Primary Controls	Time & temp zoned + weather compensator	Time & temp zone controlled + delayed start thermostat
Secondary heating	None	None
Water Heating	From combi boiler	Megaflo 250 litres, Heat loss 1.61kW / 24hr

If required, include LZC technology to ensure there is a thirty five percent (35%) reduction in CO₂ emissions, the details of any Solar PV may be viewed [here](#)

6 Appraisal

6.1 District heating networks for Land adjacent to 2 Coleridge Road E8 8EJ

6.1.1 London Heat Map



As you will see from the map above this project does not lie within an area designated as highly likely to benefit from district heating network

6.1.2 Local Authorities Strategic Plans

There are currently no plans available for local (within 1,000m) District Heating Systems and the Local Authority have no published strategy for implementation before 2030

6.1.3 Projects method of address the potential

As this is not a major project there is no requirement for DHN connectivity or to install a communal heating system

6.2 Possible Options Summary for Land adjacent to 2 Coleridge Road E8 8EJ

	Energy Output	Return on investment	Physical, Spatial & Land Use Impact	Noise Impact	Suitability of technology	Feasible
 Wind turbine	Electric	None	Are wind speeds at least 6 m/s? Is the area free from obstructions that could cause local wind turbulence	Wind turbines generate noise that can be heard up to a few hundred metres away. However, this level is normal only marginal greater than the actual wind noise itself.	Windspeed at site is 5.1 m/s which is below the requirements for small scale	No
 Photovoltaics	Electric	None	Will the buildings have an east to west (through south) facing roof or flat roof? Are roofs free from overshadowing for most of the day from buildings or other structures?	None	Solar PV is the chosen technology	Yes
 Solar Thermal	Hot water	Renewable Heat Incentive (RHI)	Will the building have all year-demand for hot water Will the buildings have an open aspect southeast to southwest facing roof of at least 4m2? Is space available for hot water cylinder near the panels? Is the building in a conservation area?	None	Solar hot water works best when the panels can be located close to the water storage	Yes
 Biomass Boiler	Heat & hot water	Renewable Heat Incentive (RHI)	Is there a local supply and space for storage of biomass fuel or can one be set up? Is a room heater or boiler required	Normal noises associated with boiler plant. Potential additional noise generation associates with the fuel deliveries.	This is not suitable for the site because of the size of the systems and storage of fuel	No
 Air Sourced Heat Pump	Heat & hot water	Renewable Heat Incentive (RHI)	Is there space for siting the heat pump, including the desired room for air movement?	Minimum noise	ASHP is the chosen technology	Yes
 Ground source heat pump	Heat & hot water	Renewable Heat Incentive (RHI)	Will there be room for a horizontal buried pipe? Is the ground suitable for vertical pipe system?	Minimal noise	The use of GSHP is suitable in meeting the requirements of the planning condition however there is insufficient space for the infrastructure.	No
 Combine heat & power	Heat, hot water & energy	None	CHP works well with a large demand (large plots) to create more electricity generation, as the boiler itself is not that efficient with small demand requirements. The use of gas is now being phased out thus unlikely to be used	Normal noises associated with boiler plant	The size of the dwellings within this development makes the installation of CHP plant inefficient	No

6.2.1 Potential Options

6.2.1.1 Air Sourced Heat Pumps

Although it is generally considered that grid-based electricity, used to power ASHPs, has a larger NO_x and similar CO₂ footprint to that of alternatives such as gas or biomass, because gas boilers are to be phased out of new builds by 2030 and the consistent increase in the use of LZC technology in grid-based generation these arguments are losing ground especially as the inherent efficiency of ASHP is increasing year on year.

6.2.1.2 Photovoltaic Cells

There is a flat roof on this development that would make siting the solar PV cells easy and out of sight from most pedestrians. PV cells may be installed per dwelling or may be allocated to flats by floor area providing more flexibility and provide the necessary reduction in CO₂ emissions

7 Findings

7.1 Preferred options for Land adjacent to 2 Coleridge Road E8 8EJ

The preferred options for this site are:

- Air Sourced Heat Pump
- Solar PV cells – there is the required compatible space on the roof for the panels

7.2 Carbon Dioxide Emissions by Stage

The whole project	Carbon dioxide emissions (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline L1(2)a - DER(BER) = TER L1(2)b - DER(BER) = Notional DER(BER)	1.76	0.73
Be Lean (Demand reduction)	0.68	0.73
Be Clean (District and/or Communal Heating systems)	0.68	0.73
Be Green (Low or Zero Carbon Technology)	0.31	0.73

7.3 Project Energy Required by Stage

Part L1a domestic	Project Energy Required (kWh/year)		
	Regulated	Unregulated	Total
Baseline (Proposed = Notional)	11,444.04	3,118.36	14,562.40
Be Lean (Demand Reductions)	4,577.25	3,118.36	7,695.61
Be Clean (District/Communal heat)	4,577.25	3,118.36	7,695.61
Be Green (LZC Tech only)	3,527.50	3,118.36	6,645.86
Be Green (LZC tech + generated)	1,816.39	3,118.36	4,934.75

8 Conclusion

A domestic 61.45% reduction in domestic CO₂ emissions reduction in CO₂ emissions for this development by increasing building Be Lean energy efficiency alone.

A further 21.15% savings may be obtained by installing Air Sourced Heat Pumps and including Solar PV technologies, for the domestic units generating a total of 82.60% CO₂ reduction for the project. This will enable the development Land adjacent to 2 Coleridge Road E8 8EJ to exceed the minimum thirty five percent (35%) reduction in CO₂ emissions required by London Borough of Haringey

Details of the Solar PV installation may be found in [here](#)

A Appendix – Supporting details from SAP calculations

A.1 Solar PV Feasibility Table

Solar PV Information Required		
Model	JA Solar Mono MBB Percium Half-Cell	
Panel wattage	450 W	
Efficiency (of the Solar PV panels)	20.70 %	
Number of PV panels	5	
Panel size (width : height) mm	996	2180
Area of PV panels	10.86 m ²	
Total Capacity (Installed Solar PV Power)	2.25 kW _{hp}	
Total Energy Output (of Solar PV)	1711.11 kWh/year	
% regulated site energy requirements met by Solar PV	48.51 %	
% total site energy requirements met by Solar PV	25.75 %	
CO ₂ Offset by Solar PV	371.29 kgCO ₂ /year	
Emissions Reductions (from Solar PV)	21.15 %	

A.2 Carbon Dioxide Reductions after each stage of the hierarchy

The whole project	Regulated Carbon dioxide savings	
	(Tonnes CO ₂ per annum)	Savings (%)
Savings from energy demand reduction	1.08	61.45%
Savings after addressing heating	0.00	0.00%
Savings from low or zero carbon technology	0.37	21.15%
Total Cumulative Savings	1.45	82.60%
Local Authority Target Minimum Savings (whole project)	0.61	35.00%

A.3 TFA, DER, TER, DFEE & TFEE for each domestic unit

A.3.1 Baseline

Description			CO ₂ emissions				Primary Energy			Fabric Efficiency		
Unit	L1a	TFA	DER	TER	Reg. kg/year	Unreg. Kg/year	DPER	TPER	%improvement	DFEE	TFEE	%improvement
House 1	L1a	140.11	12.53	12.53	1,755.58	726.58	66.69	66.69	0.00%	59.79	59.79	0.00%

A.3.2 Be Lean (after energy reductions)

Description			CO ₂ emissions				Primary Energy			Fabric Efficiency		
Unit	L1a	TFA	DER	TER	Reg. kg/year	Unreg. Kg/year	DPER	TPER	%improvement	DFEE	TFEE	%improvement
House 1	L1a	140.11	4.83	12.53	676.73	726.58	50.55	66.69	24.20%	52.98	59.79	11.39%

A.3.3 Be Clean (after addressing the heating systems)

Description			CO ₂ emissions				Primary Energy			Fabric Efficiency		
Unit	L1a	TFA	DER	TER	Reg. kg/year	Unreg. Kg/year	DPER	TPER	%improvement	DFEE	TFEE	%improvement
House 1	L1a	140.11	4.83	12.53	676.73	726.58	50.55	66.69	24.20%	52.98	59.79	11.39%

A.3.4 Be Green (after addition of low or zero carbon technology)

Description			CO ₂ emissions				Primary Energy			Fabric Efficiency		
Unit	L1a	TFA	DER	TER	Reg. kg/year	Unreg. Kg/year	DPER	TPER	%improvement	DFEE	TFEE	%improvement
House 1	L1a	140.11	2.18	12.53	305.44	726.58	26.17	66.69	60.76%	52.98	59.79	11.39%

A.4 Project energy requirements after each stage of the hierarchy

Part L1a domestic	Project Energy Required (kWh/year)			% Energy Savings		Energy Generated (kWh/year)
	Regulated	Unregulated	Total	Regulated	Total	Solar PV
Baseline (Proposed = Notional)	11,444.04	3,118.36	14,562.40			0.00
Be Lean (Demand Reductions)	4,577.25	3,118.36	7,695.61	60.00%	47.15%	0.00
Be Clean (District/Communal heat)	4,577.25	3,118.36	7,695.61	0.00%	0.00%	0.00
Be Green (LZC Tech only)	3,527.50	3,118.36	6,645.86	9.17%	7.21%	N/A
Be Green (LZC tech + generated)	1,816.39	3,118.36	4,934.75	24.12%	18.96%	1,711.11
Total Savings				84.13%	66.11%	
	PV as % Regulated Energy Requirement					48.51%
	PV as % Total Energy Requirement					25.75%

A.5 Project energy demand details by stage

A.5.1 Baseline

Energy Demand (kWh/year)										
Unit	Space	Water	Cooling	Fans & Pumps	Lighting	Cooking	Appliance	Tot Regulated	Tot Unreg'ed	Total/dwelling
House 1	8,003.19	3,093.04	0.00	86.00	261.81	157.64	2,960.72	11,444.04	3,118.36	14,562.40

A.5.2 Be Lean (after energy reductions)

Energy Demand (kWh/year)										
Unit	Space	Water	Cooling	Fans & Pumps	Lighting	Cooking	Appliance	Tot Regulated	Tot Unreg'ed	Total/dwelling
House 1	2,162.67	1,638.73	0.00	544.37	231.48	157.64	2,960.72	4,577.25	3,118.36	7,695.61

A.5.3 Be Clean (after addressing the heating systems)

Energy Demand (kWh/year)										
Unit	Space	Water	Cooling	Fans & Pumps	Lighting	Cooking	Appliance	Tot Regulated	Tot Unreg'ed	Total/dwelling
House 1	2162.67	1638.73	0.00	544.37	231.48	157.64	2,960.72	4,577.25	3,118.36	7,695.61

A.5.4 Be Green (after addition of low or zero carbon technology)

Energy Demand (kWh/year) (total includes the reduction from energy generation)											Energy Gen'd
Unit	Space	Water	Cooling	Fans & Pumps	Lighting	Cooking	Appliance	Tot Regulated	Tot Unreg'ed	Total/dwelling	PV (kWh/year)
House 1	1,658.87	1,092.78	0.00	544.37	231.48	157.64	2,960.72	3,527.50	3,118.36	4,934.75	1,711.11

B Sustainability criteria specific to this project

B.1 BRE Internal Water Usage Calculator

BRE Global 2010. BRE Certification is a registered trademark owned by BRE Global and may not be used without BRE Global's written permission.
Permission is given for this tool to be copied without infringement of copyright for use only on projects where a Code for Sustainable Homes assessment is carried out. Whilst every care is taken in preparing the Wat 1 assessment tool, BRE cannot accept responsibility for any inaccuracies or for consequential loss incurred as a result of such inaccuracies arising through the use of the Wat 1 tool.
PRINTING: before printing please make sure that in "Page Setup" you have selected the page to be as "Landscape" and that the Scale has been set up to 70% (maximum)

Job no:
Date:
Assessor name:
Registration no:
Development name:

AJP-119
21/04/2026
Derek GC White
ESS/004958
L300-1863
land adjacent to
2 Colersidge Road London N8 8EJ



WATER EFFICIENCY CALCULATOR FOR NEW DWELLINGS - (BASIC CALCULATOR)																					
House Type:		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		Type 9		Type 10	
Description:		House 1																			
Installation Type	Unit of measure	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day
Is a dual or single flush WC specified?	Dual	Click to Select																			
	Full flush volume	4.5	6.57	Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select	
	Part flush volume	2.5	7.40	Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select	
Taps (excluding kitchen and external taps)	Flow rate (litres / minute)	3.5	7.11	Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select	
	Are both a Bath & Shower Present?	Bath & Shower		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select	
Bath	Capacity to overflow	175	19.25	Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select	
Shower	Flow rate (litres / minute)	8	34.96	Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select	
Kitchen sink taps	Flow rate (litres / minute)	12	15.64	Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select	
Has a washing machine been specified?		Yes		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select	
Washing Machine	Litres / kg	7.5	15.75	Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select	
Has a dishwasher been specified?		Yes		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select	
Dishwasher	Litres / place setting	0.9	3.24	Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select	
Has a waste disposal unit been specified?		No		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select	
Water Softener	Litres / person / day	0	0.00	Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select		0.00		Click to Select	
Calculated Use		109.9		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Normalisation factor		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91	
Code for Sustainable Homes	Total Consumption	100.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	Mandatory level	Level 3/4		-		-		-		-		-		-		-		-		-	
Building Regulations 17.K	External use	5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0	
	Total Consumption	105.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	17.K Compliance?	Yes		-		-		-		-		-		-		-		-		-	

B.2 BRE Green Guide Rating & Associated materials breakdown

Following are a set of constructions, from which the project may select, all of which are rated as highly sustainable

B.2.1 METSEC Wall

Green Guide 2008 ratings

Building type >	<u>Domestic</u>
Category >	<u>External Wall Construction</u>
Sub-category >	<u>Brickwork on Framed Construction</u>
Element type >	<u>Light Steel Framed Construction</u>

Element	Brickwork, cement mortar, cement-bonded particle board sheathing, insulation, light steel frame, vapour control layer, plasterboard on battens, paint
Element Number	1206470004
Summary Rating	A+
Climate Change	A
Water Extraction	A+
Mineral Resource Extraction	A+
Stratospheric Ozone Depletion	A
Human Toxicity	A+
Ecotoxicity to Freshwater	A+
Nuclear Waste (higher level)	A+
Ecotoxicity to Land	A+
Waste Disposal	A+
Fossil Fuel Depletion	A+
Eutrophication	A+
Photochemical Ozone Creation	A+
Acidification	A
Kg of CO ₂ eq. (60 years)	94.0

B.2.2 Brick faced cavity wall

Green Guide 2008 ratings

Building type >	Domestic
Category >	External Wall Construction
Sub-category >	Blockwork Cavity Wall
Element type >	Brick, Stone & Block Cavity Wall

Element	Brickwork outer leaf, insulation, aircrete blockwork inner leaf, cement mortar, plasterboard on battens, paint
Element Number	806170615
Summary Rating	A+
Climate Change	A
Water Extraction	A+
Mineral Resource Extraction	A+
Stratospheric Ozone Depletion	A
Human Toxicity	A+
Ecotoxicity to Freshwater	A+
Nuclear Waste (higher level)	A+
Ecotoxicity to Land	A+
Waste Disposal	A+
Fossil Fuel Depletion	A+
Eutrophication	A+
Photochemical Ozone Creation	A+
Acidification	A
Kg of CO₂ eq. (60 years)	74.0

B.2.3 PVCu Double Glazed windows**Green Guide 2008 ratings**Building type > DomesticCategory > Domestic WindowsElement type > Windows

Element	PVC-U window with steel reinforcement, double glazed
Element Number	813100009
Summary Rating	A
Climate Change	D
Water Extraction	E
Mineral Resource Extraction	A
Stratospheric Ozone Depletion	B
Human Toxicity	A+
Ecotoxicity to Freshwater	A+
Nuclear Waste (higher level)	B
Ecotoxicity to Land	A
Waste Disposal	C
Fossil Fuel Depletion	E
Eutrophication	B
Photochemical Ozone Creation	A+
Acidification	A
Kg of CO ₂ eq. (60 years)	310.0

B.2.4 Metal composite windows

Green Guide 2008 ratings

Building type >	Domestic
Category >	Domestic Windows
Element type >	Windows

Element	Powder coated aluminium clad softwood window, double glazed, water based translucent coating internally (WWA clip-on specification)
Element Number	1413100007
Summary Rating	A+
Climate Change	B
Water Extraction	B
Mineral Resource Extraction	A
Stratospheric Ozone Depletion	B
Human Toxicity	A
Ecotoxicity to Freshwater	A+
Nuclear Waste (higher level)	B
Ecotoxicity to Land	A+
Waste Disposal	C
Fossil Fuel Depletion	A+
Eutrophication	A
Photochemical Ozone Creation	A+
Acidification	A
Kg of CO₂ eq. (60 years)	220.0

B.2.5 Warm Deck Flat Roof**Green Guide 2008 ratings**Building type > DomesticCategory > Roof ConstructionElement type > Flat Roof: Warm Deck

Element	Timber joists, plywood (temperate EN 636-2) decking, vapour control layer, insulation, PVC single ply waterproofing membrane
---------	--

Element Number	1212540029
----------------	------------

Summary Rating	A+
----------------	----

Climate Change	A+
----------------	----

Water Extraction	A
------------------	---

Mineral Resource Extraction	A+
-----------------------------	----

Stratospheric Ozone Depletion	B
-------------------------------	---

Human Toxicity	A
----------------	---

Ecotoxicity to Freshwater	A
---------------------------	---

Nuclear Waste (higher level)	A
------------------------------	---

Ecotoxicity to Land	B
---------------------	---

Waste Disposal	A+
----------------	----

Fossil Fuel Depletion	A+
-----------------------	----

Eutrophication	A+
----------------	----

Photochemical Ozone Creation	A
------------------------------	---

Acidification	A+
---------------	----

Kg of CO ₂ eq. (60 years)	36.0
--------------------------------------	------

B.2.6 Pitched Roof Timber Construction

Green Guide 2008 ratings

Building type >	Domestic
Category >	Roof Construction
Element type >	Pitched Roof Timber Construction

Element	Timber trussed rafters and joists with insulation, roofing underlay, counterbattens, battens and UK produced clay plain tiles
Element Number	812410006
Summary Rating	A+
Climate Change	A
Water Extraction	A+
Mineral Resource Extraction	A+
Stratospheric Ozone Depletion	A
Human Toxicity	A+
Ecotoxicity to Freshwater	A+
Nuclear Waste (higher level)	B
Ecotoxicity to Land	A+
Waste Disposal	A+
Fossil Fuel Depletion	A
Eutrophication	A+
Photochemical Ozone Creation	A
Acidification	A+
Kg of CO₂ eq. (60 years)	77.0

B.3 50% Timber Accredited Sources Compliance

All timber will be sourced from companies that adhere to the EU Timber Regulations and is likely to be Travis Perkins

SUPPLIER COMMITMENTS:

GUIDANCE AND FURTHER INFORMATION: TIMBER

Travis Perkins 

Timber

‘As a supplier, you commit to only supply timber products from legal and sustainable sources that don’t cause deforestation or degradation.’

- It’s the intention of the Travis Perkins Group to make sure all our timber and timber products are sourced responsibly and legally, and without causing deforestation or degradation. These are defined as:
 - Deforestation: A net decrease in the area covered by forest.
 - Degradation: Changes within the forest, such as overexploitation and disease, which have been caused by human activity and which reduce the forest’s quality and function, therefore lowering its capacity to supply products.
- The easiest way for suppliers to support our intentions is to purchase material which complies with the EU Timber Regulation and has a Chain of Custody certified by either the Forest Stewardship Council (FSC ®) or the Programme for the Endorsement of Forest Certification (PEFC).
- The EU Timber Regulation bans the importation of illegal timber into the EU. It requires anyone handling wood or wood products to assess the risk that those products may have come from an illegal source, and to act to mitigate that risk.
- The FSC and PEFC are international, non-profit, multi stakeholder organisations that promote sustainable forest management through independent third party certification. The Travis Perkins Group maintains a certified Chain of Custody for both FSC and PEFC, and this is an essential requirement for many of our customers.
- We work with our suppliers to make sure all the timber and timber fibre products we purchase come from certified FSC or PEFC sources. Wherever possible, this should be full Chain of Custody certified with a claim of at least ‘FSC Mix’ or ‘PEFC 70%’.
- We’ll only accept products without FSC or PEFC Chain of Custody certification where prior approval has been granted **by exception** after a formal risk assessment. We’ll take swift and prompt action to remove any timber from our business if we receive credible information that it doesn’t meet our policy requirements or values.
- Should the credibility of a certificate or mitigating information be in doubt, we may apply additional verification measures or obtain further assurances that a source is in line with our policy and values. This could include third party isotope, DNA or fibre testing to validate species and country of origin claims.

Useful Links

- FSC: [link](#)
- PEFC: [link](#)
- EU Timber Regulations: [link](#)
- EUTR Guidance: [link](#)
- WWF Global Forest Trust Network: [link](#)



BM TRADA

CERTIFICATE OF REGISTRATION

This is to certify that

Travis Perkins Trading Company Ltd
Lodge Way House
Lodge Way
Harlestone Road
Northampton
NN15 7UG

has been audited and found to meet the requirements of standard **PEFC International Standard PEFC ST 2002:2010 and PEFC ST 2002:2013**

Appendix 1

Appendix 3

Appendix 4 Chain of Custody Certification

As amended - www.pefc.org

Scope of certification

The Purchasing, Importation, Warehousing, Processing, Sales and Distribution of PEFC Certified Products including Outsourcing

Products:

Imported and British
Softwoods
Hardwoods
Chipboard
Plywood
OSB
MDF Products
Solid and Engineered
Flooring
Softwood Doors and Windows
Mouldings
Stairparts
Timber Garden Buildings
Landscape Products

Raw material origin: Certified Material

Vic Bowen
Chief Operating Officer
Certification UK

Certificate number BMT-PEFC-0006

Issue number: 2013-02

Date of initial certification: 30 July 2003

Certificate start date: 31 July 2013

Certificate expiry date: 29 June 2018

BM TRADA Certification Ltd, Chiltern House, Stoking Lane, High Wycombe, Buckinghamshire, HP14 4ND, UK

This certificate remains the property of BM TRADA Certification Ltd. This certificate and all copies or reproductions of the certificate shall be returned to BM TRADA Certification Ltd or destroyed if requested. Further clarification regarding the scope of this certificate and verification of the certificate is available through BM TRADA at the above address or at www.pefc.org

This certificate itself does not constitute evidence that a particular product supplied by the certificate holder is PEFC certified. Products offered, shipped or sold by the certificate holder can only be considered to be covered by the scope of this certificate when the required PEFC claim is stated on invoices and shipping documents.

The use of the accreditation mark indicates accreditation in respect of those activities covered by the UKAS accreditation certification 012.

Multisite clients - The scope of certification shown above includes the participating sites shown in appendix A



The mark of
responsible forestry

BM TRADA

CERTIFICATE OF REGISTRATION

This is to certify that

Travis Perkins Trading Company Ltd
Lodge Way House
Lodge Way
Harlestone Road
Northampton
NN15 7UG

has been audited and found to meet the requirements of standard(s) **FSC-STD-50-001 (Version 1.2) EN and FSC-STD-40-004 (Version 2.1) EN and FSC-STD-40-003 (Version 1.0) EN** for **FSC® Chain of Custody Certification**

Scope of certification

The Purchasing, Importation, Warehousing, Processing, Sales and Distribution of FSC Certified Products including Outsourcing

Products:

Imported and British Softwoods
Hardwoods
Chipboard
Plywood
OSB
MDF Products
Solid and Engineered Flooring
Softwood Doors and Windows
Mouldings
Stairparts
Timber Garden Buildings
Landscape Products

Certificate number TT-COC-001671

Issue number: 2013-02

Date of initial certification: 30 July 2003

Certificate start date: 30 June 2013

Certificate expiry date: 29 June 2018

Vic Bowen
Chief Operating Officer
Certification UK

BM TRADA Certification Ltd, Chiltern House, Stoking Lane, High Wycombe, Buckinghamshire, HP14 4ND, UK

This certificate remains the property of BM TRADA Certification Ltd. This certificate and all copies or reproductions of the certificate shall be returned to BM TRADA Certification Ltd or destroyed if requested. The validity of this certificate and the list of products covered by this certificate can be verified on www.fsc-info.org Forest Stewardship Council®

This certificate itself does not constitute evidence that a particular product supplied by the certificate holder is FSC certified (or FSC Controlled Wood). Products offered, shipped or sold by the certificate holder can only be considered to be covered by the scope of this certificate when the required FSC claim is stated on invoices and shipping documents.

Multisite clients - The scope of certification shown above includes the participating sites shown in appendix A

B.4 Zero Ozone Depletion and toxicity compliance



Acoustic Partition Roll (APR 1200)

Isover Acoustic Partition Roll (APR 1200) provides high levels of acoustic insulation in partitions, walls and floors to meet requirements in domestic and non-residential buildings.

High-performance acoustic insulation

A glass mineral wool roll providing high levels of acoustic insulation in partitions, walls and floors to meet acoustic requirements in domestic and non-residential applications. The product carries a system lifetime performance guarantee when used in British Gypsum SpecSure warranted drywall and floor systems. The rolls push-fit between 600mm stud centres making it easy to install.

View NBSPlus product specification by NBS



<https://www.isover.co.uk/products/acoustic-partition-roll-apr-1200>

1/5

17/07/2018

Acoustic Partition Roll (APR 1200)

Key Benefits

- British Gypsum SpecSure® Warranty - Covered by the SpecSure® Warranty with guaranteed lifetime performance when used as a part of British Gypsum drywall and acoustic floor systems.
- Non-combustible - Isover glass mineral wool insulation has an **A1 Euroclass** fire rating – the best attainable.
- Recycled content - Manufactured from up to 86% recycled glass.
- Protected planet - Zero Ozone Depletion Potential (ODP) and Global Warming Potential of less than 5.

Variants Details

Product details

Order Code	Thickness	Width (mm)	Length	Pack area (m2)	Pallet area (m2)	Product Name	Units per pallet
5200625577	25	2 x 600	20000	24	576	Acoustic Partition Roll - 25mm (2 x 600)	24
5200625578	50	2 x 600	13000	15.6	374.4	Acoustic Partition Roll - 50mm	24
5200625579	65	2 x 600	10000	12	288	Acoustic Partition Roll - 65mm	24
5200625580	75	2 x 600	12200	14.64	351.38	Acoustic Partition Roll - 75mm	24
5200625581	100	2 x 600	9170	11	264	Acoustic Partition Roll - 100mm	24

Related Documentation

Document	Category
 DoP - 0007-CPR-131001-01 - Acoustic Partition Roll (APR 1200) 07 / 10 / 2015	Declaration Of Performance, Building Insulation 

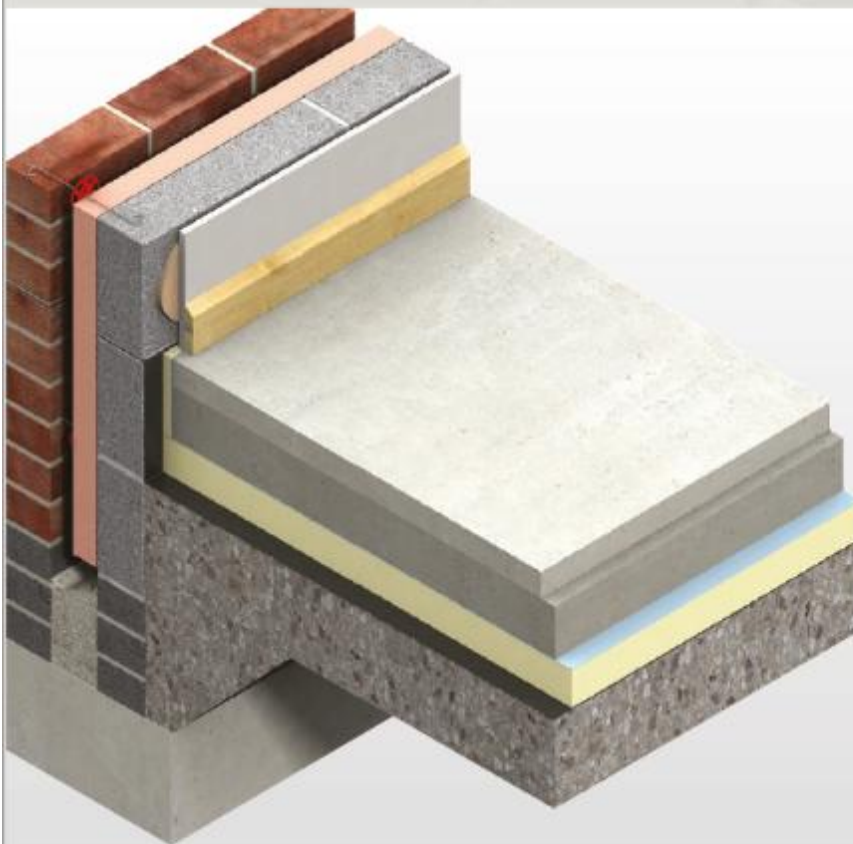
Insulation



CI/SfB
(13.9) Pn7 M2
Seventh Issue September 2017

Thermafloor® TF70

INSULATION FOR SOLID CONCRETE AND SUSPENDED
GROUND FLOORS



- High performance rigid thermoset insulation – thermal conductivity 0.022 W/m-K
- Can reduce the cost of related items – soil removal, service connections
- Unaffected by air infiltration
- Resistant to the passage of water vapour
- Easy to handle and install
- Ideal for new build and refurbishment
- Non-deleterious material
- Manufactured with a blowing agent that has zero ODP and low GWP

Fibre-free
Core


Kingspan®
Low Energy –
Low Carbon Buildings

Design Considerations

Environmental Impact & Responsible Sourcing

Green Guide Rating

An Ecoprofile, certified by BRE Certification to the 2008 BRE Environmental Profiles Methodology, has been created for **Kingspan Thermafloor® TF70** produced at Kingspan Insulation's British and Irish manufacturing facilities. The BRE has assigned the product a 2008 Green Guide Summary Rating of A+.



Environmental Profile Scheme
Certificate Number ENP 500

Responsible Sourcing

Kingspan Thermafloor® TF70 produced at Kingspan Insulation's Pembroke and Selby manufacturing facilities is certified to BES 6001 (Framework Standard for the Responsible Sourcing of Construction Products) 'Excellent'.



Kingspan Thermafloor® TF70 produced at Kingspan Insulation's Castleblayney manufacturing facilities is manufactured under a management system certified to ISO 14001: 2004.

NB The above information is correct at the time of writing. Please confirm at the point of need by contacting Kingspan Insulation's Technical Service Department (see rear cover), from which copies of Kingspan Insulation's certificates can be obtained.

Sustainability & Responsibility

Kingspan Insulation has a long-term commitment to sustainability and responsibility: as a manufacturer and supplier of insulation products; as an employer; as a substantial landholder; and as a key member of its neighbouring communities.

A report covering the sustainability and responsibility of Kingspan Insulation Ltd's operations at its Pembroke, Herefordshire and Selby, North Yorkshire manufacturing facilities is available at www.kingspaninsulation.co.uk/sustainabilityandresponsibility.

Specification Clause

Kingspan Thermafloor® TF70 should be described in specifications as:-

The floor insulation shall be **Kingspan Thermafloor® TF70** _____ mm thick: comprising a high performance rigid thermoset insulation core faced on both sides with a low emissivity composite foil facing. The product shall be manufactured:

with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP); in accordance with the requirements of BS 4841-6; under a management system certified to ISO 9001: 2008, ISO 14001: 2004, BS / I.S. OHSAS 18001: 2007 and ISO 50001: 2011; by Kingspan Insulation Limited; and installed in accordance with the instructions issued by them.

NBS Specifications

Details also available in NBS Plus.

NBS users should refer to clause(s):

E20 200, K11 115, 125, 135, 145, 215, 225, 235, 245, M10 290, M13 260 and P10 255

(Standard and Intermediate) E20 30 (Minor Works)



Building Information Modelling (BIM)

Kingspan Insulation's BIM objects can be downloaded in Revit and in IFC formats. For more information please visit www.kingspaninsulation.co.uk/bim.

Design Standards

Consideration should be given to the recommendations of BS 8102: 2009 (Code of practice for protection of buildings against water from the ground), BS 8215: 1991 (Code of practice for design and installation of damp proof courses in masonry construction), and the information given in Building Research Establishment Digest 104 (Floor Screeds).

Compressive Loads

Un-reinforced floor screeds can be used in conjunction with **Kingspan Thermafloor® TF70** in most applications. The compressive strength of **Kingspan Thermafloor® TF70** offers considerable advantages over some other floor insulants. Providing a minimum compressive strength of 140 kPa at 10% compression allows greater floor loads to be considered and therefore additional scope in the use of **Kingspan Thermafloor® TF70**. However, where floor loads are to be excessive, consideration should be given to the use of **Kingspan Styrozone®** extruded polystyrene insulation which has greater compressive strength. For further information please contact the Kingspan Insulation Technical Service Department (see rear cover).

Substrate

Kingspan Thermafloor® TF70 is not recommended for use in direct contact with subsoil and must be used over a DPM.

Lightning Protection

Building designers should give consideration to the requirements of BS / I.S. EN 62305: 2011 (Protection against lightning).

Insulation



See rear cover for applicable countries

TECHNICAL
BULLETIN

Third Issue November 2016

Same on the outside, different on the inside

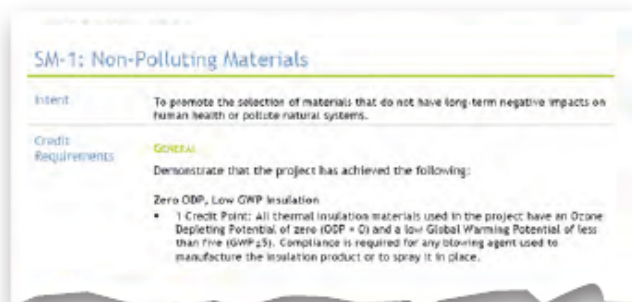
GLOBAL WARMING POTENTIAL AND OZONE DEPLETION
POTENTIAL OF DIFFERENT PIR INSULATION



Fibre-free
Core


Kingspan™
*Low Energy –
Low Carbon Buildings*

Within the Estidama Rating Systems, 1 credit point is available if all thermal insulation materials used have an Ozone Depletion Potential of zero (ODP=0) and a Global Warming Potential of less than 5 (GWP ≤ 5). This includes all blowing agents used in the manufacture of the insulation, but also, all those used to spray it in place, if required.



Kingspan KoolDuct™ Panels, Kingspan PalDuct Hydro Panels, all products in the Kingspan Kooltherm Range, the Kingspan Therma™ range and the Kingspan Styrozone™ N-range and are manufactured with blowing agents that are deemed to have, or have, a zero Ozone Depletion Potential (ODP) and a Global Warming Potential (GWP) <5.

Kingspan PalDuct Hydro - a CFC/HCFC-free Product

Kingspan PalDuct Hydro Panels comprise a fibre-free high performance rigid thermoset polyisocyanurate (PIR)

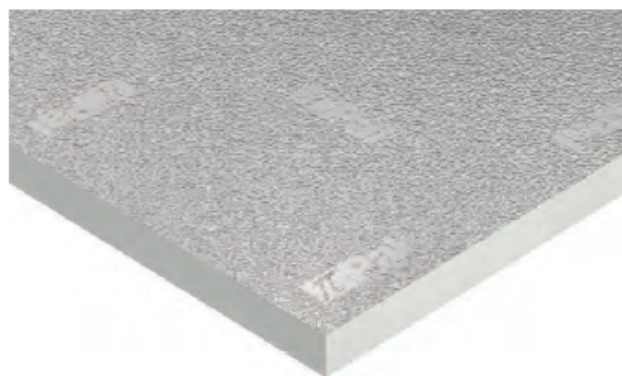


Insulation core, faced on both sides with an embossed aluminium foil. The aluminium foil is lacquered with corrosion resistant polymer varnish.

Property	Value	
	20PH80	30PH200
Product Thickness (mm)	20	30
Product Dimensions (mm)	4000 x 1200	4000 x 1200
Density (kg/m³)	50 ± 5	50 ± 5
Thermal Conductivity (mm)	0.020	0.020

Table 2: Kingspan PalDuct Hydro Panels product data

The core is manufactured with a CFC/HCFC-free blowing agent, which has zero Ozone Depletion Potential (ODP) and Global Warming Potential (GWP) of less than 5.



Kingspan PalDuct Hydro Panel

Page 5 of this document clarifies that the term Low GWP means a GWP < 5 for all the products listed below, one of which is Kingspan Therma Range that includes Thermafloor TF70

The Technical manual may be downloaded from <https://www.kingspan.com/meati/en-in/product-groups/insulation/knowledge-base/white-papers-technical-bulletins/ozone-depletion-and-global-warming-potential-of-th>


www.knaufinsulation.co.uk

SUPAFIL 34 CAVITY WALL INSULATION

March 2018



APPLICATIONS



DESCRIPTION

Supafil 34 cavity wall insulation is a silicone treated high performance, non-combustible Glass Mineral Wool for injection into masonry cavity walls only by approved Knauf Insulation contractors. With improved thermal performance, Supafil 34 can help to achieve improved U-Values and is supplied loose in polythene bales.

PERFORMANCE

Thermal

Thermal conductivity: 0.034W/mK declared to Lambda 90/90

Fire

Classification: EUROCLASS A1 to BS EN 13501-1

Vapour resistivity

Water vapour resistivity: 5.00MNs/g.m

BENEFITS

- ✓ Euroclass A1 non-combustible
- ✓ British Board of Agrément approved
- ✓ Suitable for new-build or retrofit
- ✓ Installed by approved contractors - quick and clean to install
- ✓ Injected after wall constructed, allowing empty cavity to be checked before installation

SPECIFICATIONS

Typical U-values (W/m²K) for masonry cavity walls insulated with Supafil 40 Cavity Wall Insulation

Product	Weight per bale (kg)	Installed density (kg/m ³)	Thermal conductivity (W/mK)
Supafil 34	15.5	min. 25	0.034

All dimensions are nominal

Cavity width (mm)	Declared thermal resistance (m ² K/W)	Minimum bag usage rate (bags per 100m ²)
90	2.60	14.52
100	2.90	16.13
125	3.65	20.16
150	4.40	24.19

The usage rate is based on an installed density of 25.00kg/m³

CERTIFICATION





SUPAFIL 34 CAVITY WALL INSULATION

March 2018

ADDITIONAL INFORMATION

Certification

The application and installation procedure for Supafil 34 Cavity Wall Insulation is covered by British Board of Agrément Certificate 11/4857.

This product complies with the relevant sections of the:

- Building Regulations (England and Wales)
- Building Standards (Scotland)
- Building Regulations (Northern Ireland)

The BBA Certificate covers the use of Supafil 34 Cavity Wall Insulation in masonry cavity walls with a minimum 90 mm cavity width and up to 12m in height, as detailed within the BBA certificate and may be installed up to 25m subject to a satisfactory inspection of the wall construction and installation approval by Knauf Insulation. Supafil 34 can be installed in any exposure zone.

Standards

Supafil 34 Cavity Wall Insulation is manufactured in accordance with BS EN 14064, ISO 50001 Energy Management Systems, OHSAS 18001 Occupational Health and Safety Management Systems, ISO 14001 Environmental Management Systems, and ISO 9001 Quality Management Systems, as certified by Bureau Veritas.

Environmental

Supafil 34 Cavity Wall Insulation has an A+ Generic BRE Green Guide rating. Supafil 34 Cavity Wall Insulation represents no known threat to the environment and has zero Ozone Depletion Potential and zero Global Warming Potential.

Moisture resistance

Tests by the British Board of Agrément confirm that Supafil 34 Cavity Wall Insulation will not transmit water to the inner leaf. Nor will it transmit moisture by capillary action across the cavity or from below damp proof course level. This has been confirmed by independent research conducted for the Energy Saving Trust, which shows that cavity wall insulation does not add to the risk of water penetration.

Vapour resistivity

Supafil 34 Cavity Wall Insulation offers negligible resistance to the passage of water vapour and has a water vapour resistivity of 5.00 MN.s.g.m.

Handling and storage

Supafil 34 Cavity Wall Insulation is supplied in polythene packs which are designed for short term protection only. For longer term protection on site, the product should either be stored indoors, or under cover and off the ground. Supafil 34 Cavity Wall Insulation should not be left permanently exposed to the elements.



Knauf Insulation mineral wool products made with ECOSE Technology® benefit from a no added formaldehyde binder, which is up to 70% less energy intensive than traditional binders and is made from rapidly renewable bio-based materials instead of petroleum-based chemicals. The technology has been developed for Knauf Insulation's glass and rock mineral wool products, enhancing their environmental credentials without affecting the thermal, acoustic or fire performance. Insulation products made with ECOSE Technology® contain no dye or artificial colours.

Knauf Insulation Ltd

PO Box 10, Stafford Road, St.Helens,
Merseyside, WA10 3NS. UK

Customer Service: 0844 800 0135

Technical Support Team: 01744 766 666

Literature: 08700 668 660

All rights reserved, including those of photomechanical reproduction and storage in electronic media. Extreme caution was observed when putting together and processing the information, texts and illustrations in this document. Nevertheless, errors cannot quite be ruled out. The publisher and editors cannot assume legal responsibility or any liability whatever for incorrect information and the consequences thereof. The publisher and editors will be grateful for improvement suggestions and details of possible errors pointed out.

KINE1223DAT

challenge.
create.
care.



October 2011

Earthwool® Loft Roll 44

For pitched roofs at ceiling level and suspended timber floors

Description

Earthwool Loft Roll 44 is a flexible low density glass mineral wool quilt which is lightweight, flexible, resilient and non-combustible. The rolls are 1140mm wide and partially perforated to produce either 2 rolls 570mm wide or 3 rolls 380mm wide.

Application

Earthwool Loft Roll 44 is primarily used for the thermal insulation of pitched roofs at ceiling level and it can also be used to thermally insulate floors. When used to insulate at ceiling level it is usually laid in two layers, with the first layer between the joists and the second layer over, and at right angles to the joists.

Standards

Earthwool Loft Roll 44 is manufactured in accordance with BS EN 13162:2008, EN 16001:2009 Energy Management Systems, OHSAS 18001:2007 Occupational Health and Safety Management Systems, ISO 14001:2004 Environmental Management Systems, and ISO 9001:2008 Quality Management Systems, as certified by Bureau Veritas.

Performance

Thermal

Earthwool Loft Roll 44 has a thermal conductivity of 0.044W/mK.

Fire

Earthwool Loft Roll 44 is classified as Euroclass A1 to BS EN ISO 13501-1.

Benefits

- Lightweight and economic insulation quilt
- Produced for use with timber joists at 400mm and 600mm centres
- Partially cut perforations
- Provides thermal, acoustic and fire performance



Move Forward with Confidence



Earthwool® Loft Roll 44

Durability

Earthwool Loft Roll 44 is odourless, rot proof, non-hygroscopic, does not sustain vermin and will not encourage the growth of fungi, mould or bacteria.

Vapour resistance - resistivity

Earthwool Loft Roll 44 offers negligible resistance to the passage of water vapour and has a vapour resistivity of 7.00MN/g.m.

Environmental

Earthwool Loft Roll 44 is free from CFCs, HCFCs and any other material with ozone depletion potential in its manufacture and content and represents no known threat to the environment. **Earthwool Loft Roll 44's manufacture has a low impact on the environment and is classified as Zero ODP and Zero GWP.**

Handling and storage

Earthwool Loft Roll 44 is easy to handle and install, being lightweight and easily cut to size, where necessary. It is supplied in polythene packs which is designed for short term protection only. For longer term protection on site, the product should be stored either indoors, or under cover and off the ground. Installation instructions are on every pack. Earthwool Loft Roll 44 should not be left permanently exposed to the elements.

Thickness (mm)	Thermal conductivity (W/mK)	Thermal resistance (m ² K/W)	Length (m)	Width (mm)	Area per pack (m ²)
Earthwool Loft Roll 44 (Combi-cut)					
200	0.044	4.50	5.20	1140/2x570/3x380	5.93
170	0.044	3.85	7.03	1140/2x570/3x380	8.01
150	0.044	3.40	8.05	1140/2x570/3x380	9.18
100	0.044	2.25	12.18	1140/2x570/3x380	13.89
Earthwool Loft Roll 44 (Combi-cut) Shorter Lengths					
170	0.044	3.85	4.30	1140/2x570/3x380	4.90
100	0.044	2.25	7.28	1140/2x570/3x380	8.30
Earthwool Loft Roll 44 (Ready-cut)					
150	0.044	3.40	8.05	2x570	9.18
150	0.044	3.40	8.05	3x380	9.18
100	0.044	2.25	12.18	2x570	13.89
100	0.044	2.25	12.18	3x380	13.89

All dimensions are nominal

Ref: GD023211

Knauf Insulation mineral wool products with ECOSE® Technology benefit from a formaldehyde-free binder made from rapidly renewable bio-based materials instead of petroleum-based chemicals which is up to 70% less energy intensive. The technology has been developed for Knauf Insulation's glass and rock mineral wool products, enhancing their environmental credentials without affecting the thermal, acoustic or fire performance. Insulation products made with ECOSE® Technology contain no dye or artificial colours – the colour is completely natural.

Knauf Insulation Ltd

PO Box 10
Stafford Road
St Helens
Merseyside
WA10 3NS

Customer Service (sales)

Tel: 0844 800 0135

Technical Advisory Centre

Tel: 01744 766 666

Literature

Tel: 08700 668 660

www.knaufinsulation.co.uk

For more information please visit
www.knaufinsulation.co.uk

All rights reserved, including those of photomechanical reproduction and storage in electronic media. Commercial use of the processes and work activities presented in this document is not permitted. Extreme caution was observed when putting together the information, texts and illustrations in this document. Nevertheless, errors cannot quite be ruled out. The publisher and editors cannot assume legal responsibility or any liability whatever for incorrect information and the consequences thereof. The publisher and editors will be grateful for improvement suggestions and details of errors pointed out.

Class O Nitrile



These foams are highly resilient and are suitable for use with a variety of finishing solutions, including pre-applied surface protection. They can also be used with proprietary sound barrier sheets and in conjunction with open cell acoustic foams to produce an integrated thermal and acoustic insulation.

Sister products include non-halogen and EPDM options that offer a higher temperature range (up to 150°C) and better ultra violet protection, making it an ideal product for use outdoors.

Class O fire performance (BS 476 parts 6/7)

- Thermal conductivity at 0°C is 0.033 W/mK
- Highly water vapour diffusion resistant
- Factory mutual approved

Typical Properties (Class O)

Material	Typical values	Remarks
Material	Foamed nitrile rubber	
Max. surface temperature	+110°C	
Max temperature for flat surface	+85°C	
Min surface temperature	-50°C	
Thermal conductivity at 0°C	0.033 W/mK [33 + 0,1 · θ m + 0,0008 · θ m ²]/1000	Declared acc. to EN ISO 13787 Tested acc. to EN 12667 EN ISO 8497
Water vapour permeability	Moisture resistance factor μ 10,000 (Tubes 6-19 mm, sheets 6-32mm)	
Surface spread of flames	Class 1	Surface spread of flame acc. BS 476 Part 7: 1997
Fire propagation	Total index performance (1) $\leq$ 12 Sub index (1) $\leq$ 6	Fire protection acc. BS 476 Part 6: 1989
Fire performance acc. to building regulation	Class O	Test results for surface spread of flames and fire propagation meets: • Building regulation 2000 (England and Wales) • Building standard (Scotland) regulation 1990 • Building regulations 2000 (Northern Ireland) • Building regulations 1997 (Republic of Ireland) for the Class O fire category
Euroclass fire rating	Tubes B ₁ -s3, do Sheets & tapes B-s3, do	Classified acc. to EN 13501-1 Tested acc. to EN 13823 EN ISO 11925-2
Reaction to fire	Self-extinguishing, does not drip	
Resistance to	Building materials – very good Chemicals – consult product test list Ozone – very good	
Environmental aspects	ODP zero, GWP zero	
Health aspects	Dust & fibre free	

Figures Courtesy of Armacell UK Limited (December 2013).

Class "O" and Non-Halogen Flexible Elastomeric Foam are manufactured by a number of suppliers, including Armacell UK Limited, NMC Industries (INSUL-TUBE®) and Kaimann (Kaliflex).

Class O Nitrile pipe insulation will be used from Armacell, NMC or Kalmann (see above certificate)

C Renewable Energy review criteria

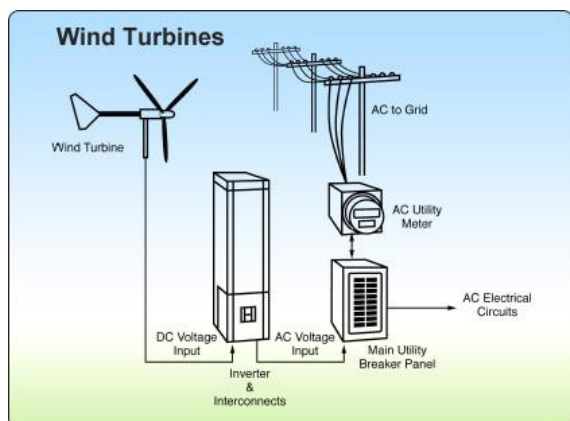
The following demonstrates the various energy systems which have been considered in relation to their sizing, potential contribution to the site and practical constraints of including the technologies, which could be applicable to this development

The following renewable and low carbon source energy systems will be considered:

- Wind turbines
- Solar thermal hot water
- Solar PV (photovoltaics')
- Heat pumps (Air/Ground/Water Sourced - ASHP/GSHP/WSHP)
- Biomass

C.1 WIND TURBINES

The UK has the largest potential wind resource in northern Europe with approximately 40 per cent of the total supply available and this potential is recognised by the UK Government, which sees wind energy as making a significant contribution to its renewable energy target of supplying 10% of total energy requirement by 2010 and in 2019 this has now far exceeded that



Wind turbines can have outputs ranging from a few watts to several megawatts and produce electricity without emitting CO₂. Energy is extracted from the wind using a rotor generally consisting of two or three blades, which have a profile like that of an airplane wing. If the diameter of the rotor is doubled, the power output from the turbine is quadrupled at a given wind speed.

Correct assessment of the resource and siting is critical before considering the installation of a turbine. Potential sites should generally have average wind speeds of greater than 5m/s at

hub height to be economically viable in the UK, although small roof mounted wind turbines (typically up to 1.5kw) can function at wind speeds as low as 3.5m/s. Wind energy availability varies on a seasonal basis, peaking during the winter months, which matches well with the requirements in a development.

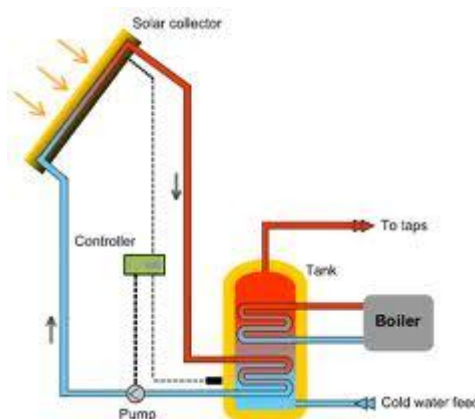
Although best suited to rural environments, modern wind turbines are becoming increasingly cost effective in low density areas where there is often the opportunity to connect them immediately to the grid, or use the electricity generated directly in a dwelling. For higher density housing, they are not as cost-effective as their output will be affected by lower and disrupted average wind speeds. Rooftop mounted turbines are becoming increasingly available, where the higher average wind speeds at increased hub heights contribute to improved performance.



Building-mounted wind turbines have been considered for use on this site, as it would be possible to mount wind turbines on roof areas. The electricity produced could be used to provide a contribution of the energy requirements.

C.2 SOLAR HOT WATER

Solar thermal or solar hot water (SHW) systems for use in dwellings use a heat collector that is usually mounted on a roof. The collector contains a fluid (usually water with glycol) which is heated by the sun. The heated liquid is then passed through a coil in a hot water storage cylinder. The water in the cylinder may then be supplied directly or raised to a higher temperature (if required) by a boiler or electric immersion heater. In this way the 'free' energy obtained from the sun can be used to offset the amount of Energy required for providing domestic hot water and will reduce both running costs (due to the fuel being displaced) and the associated CO₂ emissions. These systems do not generally provide space heating and are among the most cost-effective renewable energy systems that can be installed on dwellings in rural or urban environments.



Evacuated tube system

Solar thermal systems can be linked to a GSHP/ASHP to offer maximum hot water provision from the energy used. Typically, this will provide a proportion of the hot water demand for the dwelling over the course of a year dependent on external conditions and deliver 1400– 2000kWh of useful heating energy a year, as follows:

Summer 50% - 60%

Spring/Autumn 40% - 30%

Winter 15% - 25%

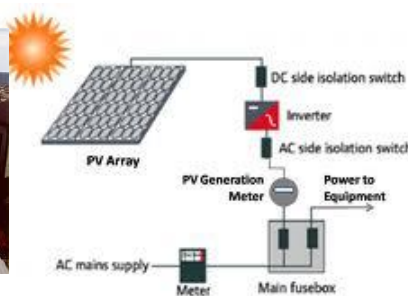
Solar thermal systems require large cylinders (around 150 litres in addition to any thermal store normally associated with system boilers), plus there will need to be pipework running from each tank to the solar panels on the roof. For a multi dwelling building these pipe runs will be a source of heat loss and therefore efficiency loss



C.3 SOLAR PV (Photovoltaic)

PV systems convert energy from the sun into electricity via semi-conducting cells. A cell consists of a junction between two thin layers of dissimilar semiconducting materials (usually based on silicon). When light shines on the junction, a difference in energy is created - known as "potential difference" or "voltage". This voltage is used to produce an electrical current (direct current - DC) which can be used directly or converted into alternating current (AC) depending on the application. AC is the most appropriate for domestic use and for exporting to the local electricity network or national grid.

The brighter the light, the more power is produced by the cells - although PV cells still produce power when the sun is hidden by clouds. However, shading from other objects (nearby buildings, trees) is a key issue with PV – they are more likely to produce a drop-in output than solar thermal panels. Ideally panels should be oriented as close to south as possible and be without shade for most of the day.



Individual PV cells produce only a small amount of power and so are connected to form modules, which are then linked to form an array which is sized depending upon the energy required. Current research suggests that a PV panel less than 0.53 kWhp becomes increasingly less able to function so use of minimum of 0.60 kWhp, per dwelling, will be considered

There are three main types of solar cells available in the UK:

Monocrystalline Very thin wafers of silicon cut from a small seed crystal. This is the most efficient and most expensive option due to the manufacturing process.

Polycrystalline Instead of one crystal, several different crystals are used in slice production. The result is cheaper PV cells than monocrystalline but with lower efficiencies.

Amorphous silicon Silicon is made into a continuous strip of film Cells can be produced more quickly and hence cheaply. This option is cheaper than mono or polycrystalline, but with substantially lower efficiencies.

A variety of solar cells based on materials other than silicon, such as cadmium telluride (CdTe) and copper indium diselenide (CIS) are also starting to appear in the UK market, as they are easier and cheaper to manufacture.

Development in PV technology is increasing due to increased demand, which is decreasing costs as well as improving efficiencies. Solar PV cells are slowly becoming popular as these improvements in cost and efficiency are realised. A feed-in-tariff incentive scheme is now in place in the UK, making Solar PV a less costly option for the long term.

C.4 HEAT PUMPS

A heat pump works by extracting heat energy from a source and transferring that energy into a form that can be used for space heating (and/or hot water pre-heating in some cases). Heat pumps operate much like a refrigerator in that they 'pump' heat from the surroundings into an enclosed space, rather than extracting heat energy from the contents of the fridge and into the room.

There are two prominent types of heat pump available in the UK, Ground Source and Air Source.

C.4.1 Ground Source Heat Pumps (GSHP)

In the UK, at one metre below the surface, the earth maintains a constant temperature of around 11 °C throughout the year. Because of its high thermal mass, the ground stores heat obtained from the sun during the summer months. Ground Source Heat Pumps can transfer this heat into a building to provide space heating and in some cases preheating domestic hot water. For every unit of electricity used to operate the system at least 3-5 units of heat energy are produced. This is known as the Coefficient of Performance (COP).

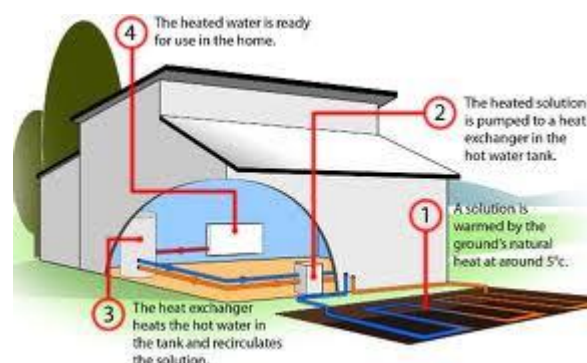
How does GSHP work? There are three important elements to a GSHP:

Ground loop

The ground loops are laid either horizontally



or vertically in boreholes



Heat pump

Comprises lengths of pipe buried in the ground, either vertically in a borehole (or series of boreholes) or horizontally in trenches (or sometimes in lakes and ponds). The pipe is usually a closed circuit and filled with a mixture of water and antifreeze, which is pumped around the pipe absorbing heat from the ground.

The hub of the system – much like a fridge or air conditioner, fluid is pumped around the system through a series of heat exchangers that extract the heat energy and transfer it to the distribution system.

Typically, two trenches of 225–300m would be required for a development of 45 kW heat loss (Heat Pump Association – Heat Pump Data sheet). A geological survey may identify the potential for 50 – 100m boreholes; however, the cost implications of either option is likely to make many developments unviable

Heat distribution system

Consists of underfloor heating (or occasionally oversized radiators) for space heating and in some cases water storage for hot water supply.

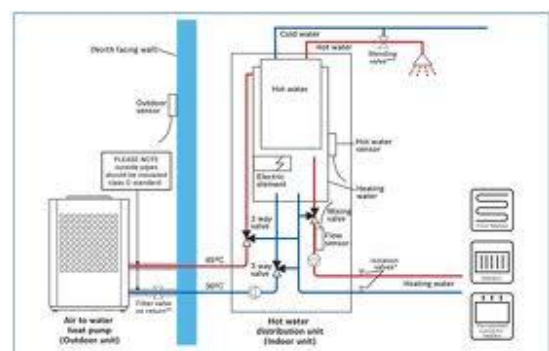


C.4.2 Air source heat pumps (ASHP)

As the name suggests, ASHPs take energy from ambient air. COP for ASHP ranges from 2.5 to 6, depending in the system used; SAP uses an assumed efficiency of 170% (COP 1.7) for ASHPs (i.e. the heat energy provided by the system is 1.7 times that of the energy used to power the system). In some system the system may be reversed and used to cool the space. There are three main types of Air Source Heat Pumps:

C.4.3 Air to Water Heat Pump

A compact unit is fixed to the exterior of the house, most commonly the rear of the property, (the unit looks much like an air conditioning unit) which passes heated refrigerant (warmed by taking heat from the outside air) to an internal unit containing the cylinder, expansion vessel and electric heater. The internal unit raises the temperature to heat domestic hot water and water-based heating systems. Back up heating is provided by an integral electric heating.

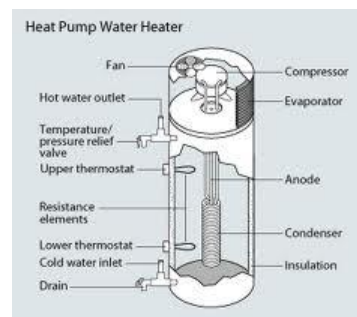


C.4.4 Air to Air Heat pumps

Fundamentally the same as an Air to Water system except air is heated directly by the inverters and blown into the space rather than via underfloor heating or radiators. This approach is often found in non-domestic units and may be considered as a modern form of Air Conditioning

C.4.5 Exhaust Air Heat Pump

A mechanical ventilation system combined with a heat pump (MVHR), which extracts air via ductwork connected to the warm areas of the dwelling such as bathrooms, kitchens, and utility rooms. Heat is removed from the air and transferred into the heat pump where the temperature is raised to heat the domestic hot water and provide space heating. Back up heating is provided by an electric heating unit integral within the system



C.4.6 Water sourced heat pumps (WSHP)

As the name suggests, WSHPs are like both ASHPs and GSHPs but take energy from a large area of water such as a lake but otherwise they work in exactly similar way

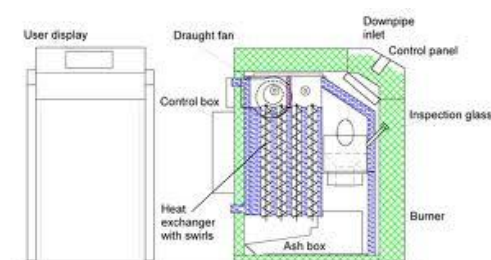
C.5 BIOMASS



Biomass is the term used to define all plant and animal material and has been used as an energy source for centuries. Although there are several different technologies available that extract heat from biomass, wood burning systems are most likely to be appropriate for use in community systems. Wood is an

extremely versatile energy source which can be burned in many different forms and numerous appliances. Burning biomass differs from other renewable energy sources in that CO₂ is

emitted when it is burned to produce heat. However, the quantity of CO₂ released is the same as the quantity of carbon absorbed by the tree whilst it was growing. Thus, burning biomass is considered carbon neutral.



To be a true renewable energy source the wood (biomass) must come from a sustainable source (i.e. it is replenished when harvested) and have minimal secondary CO₂ emissions (e.g. extra CO₂ produced through transportation).

Wood fuel can be sourced in three main forms: logs, pellets, and woodchips. Logs are a simple, cheap, and quick way of using wood fuel, although the energy density of a wood log is half that of a wood pellet, and a quarter of that of woodchip.



Burning wood fuel on a large development would involve the use of large automatic wood chip/pellet boiler situated in a central energy centre with adjacent wood pellet store to supply the installation. Due to the slow response rates of these boilers a thermal store can be included in the installation to smooth demand requirements.

To minimize pollution, the boilers must have Individual flues designed to take the emissions above the surrounding buildings and ensure dilution of particulates and pollutive emissions. The pellet fuel supply must also be monitored for moisture and dust content.

On an individual dwelling basis biomass energy, can be obtained using a wood burner to burn wood logs, chips, or pellets. It is even a desirable feature for some developments in a market where many prospective homeowners would like a wood burner installed.

The following must be considered at the early stages of a project to ensure a successful biomass scheme:

- Fuel sourcing
- Delivery of the fuel to the central fuel store
- Fuel handling
- Boiler sizing and control
- Local Environmental Pollution

