

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 06 Aug 2025 14:41:59

Project Information			
Assessed By	Jake Nixon	Building Type	House, Detached
OCDEA Registration	EES/033564	Assessment Date	2025-08-06

Dwelling Details			
Assessment Type	As designed	Total Floor Area	100 m ²
Site Reference	Plot 2	Plot Reference	ASHP + PV
Address	Plot 2, Shatterford		

Client Details	
Name	Kelly Holmes
Company	Array
Address	

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	11.37 kgCO ₂ /m ²	
Dwelling carbon dioxide emission rate	3.4 kgCO ₂ /m ²	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	59.42 kWh _{PE} /m ²	
Dwelling primary energy	35.6 kWh _{PE} /m ²	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	41.4 kWh/m ²	
Dwelling fabric energy efficiency	41.4 kWh/m ²	OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.18	Walls (2) (0.19)	OK
Party walls	0.2	N/A	N/A	N/A
Curtain walls	1.6	N/A	N/A	N/A
Floors	0.18	0.12	Ground Floor (0.12)	OK
Roofs	0.16	0.12	Roof (2) (0.14)	OK
Windows, doors, and roof windows	1.6	1.22	HGD1 (1.4)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	Net area [m ²]	U-Value [W/m ² K]
Exposed wall: Walls (1)	124.9875	0.18
Exposed wall: Walls (2)	1.89	0.19
Ground floor: Ground Floor, Ground Floor	50	0.12
Exposed roof: Roof (1)	39.2	0.11
Exposed roof: Roof (2)	14.12	0.14

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
NW Glazing, Glazing	4.19	North West	0.7	1.2
HGD1, Half Glazed Door	2.1	North West	N/A	1.4
NE Glazing, Glazing	3.9075	North East	0.7	1.2
SW Glazing, Glazing	0.66	South West	0.7	1.2
SE Glazing, Glazing	9.165	South East	0.7	1.2

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Government-approved scheme	0.232	RCD

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E3: Sill	Government-approved scheme	0.022 (!)	
External wall	E4: Jamb	Government-approved scheme	0.017 (!)	
External wall	E5: Ground floor (normal)	Government-approved scheme	0.051	
External wall	E6: Intermediate floor within a dwelling	Government-approved scheme	0.001 (!)	
External wall	E11: Eaves (insulation at rafter level)	Government-approved scheme	0.017 (!)	
External wall	E12: Gable (insulation at ceiling level)	Government-approved scheme	0.037 (!)	
External wall	E13: Gable (insulation at rafter level)	Government-approved scheme	0.039 (!)	
External wall	E16: Corner (normal)	Government-approved scheme	0.041	
Roof	R6: Flat ceiling	SAP table default	0.12	

3 Air permeability (better than typically expected values are flagged with a subsequent (!))				
Maximum permitted air permeability at 50Pa		8 m ³ /hm ²		
Dwelling air permeability at 50Pa		6.1 m ³ /hm ² , Design value		OK
Air permeability test certificate reference				

4 Space heating	
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity	
Efficiency	279.7%
Emitter type	Both radiators and underfloor
Flow temperature	45°C
System type	Heat Pump
Manufacturer	Mitsubishi Electric Europe B.V.
Model	Ecodan 8.5kW
Commissioning	
Secondary heating system: N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water	
Cylinder/store - type: Cylinder	
Capacity	180 litres
Declared heat loss	1.5 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
Waste water heat recovery system 1 - type: N/A	
Efficiency	
Manufacturer	
Model	

6 Controls	
Main heating 1 - type: Programmer, room thermostat and TRVs	
Function	
Ecodesign class	
Manufacturer	
Model	
Water heating - type: Cylinder thermostat and HW separately timed	
Manufacturer	
Model	

7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	75 lm/W	OK
External lights control	N/A	

8 Mechanical ventilation		
System type: N/A		
Maximum permitted specific fan power	N/A	
Specific fan power	N/A	N/A
Minimum permitted heat recovery efficiency	N/A	
Heat recovery efficiency	N/A	N/A
Manufacturer/Model		
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	1.78 kWp	
Orientation	South East	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Summary for Input Data



Property Reference	Plot 2	Issued on Date	06/08/2025
Assessment Reference	ASHP + PV	Prop Type Ref	SE013782
Property	Plot 2, Shatterford		

SAP Rating	86 B	DER	3.40	TER	11.37
Environmental	97 A	% DER < TER			70.10
CO ₂ Emissions (t/year)	0.3	DFEE	41.41	TFEE	41.45
Compliance Check	See BREL	% DFEE < TFEE			0.09
% DPER < TPER	40.08	DPER	35.60	TPER	59.42

Assessor Details	Mr. Jake Nixon	Assessor ID	ED44-0001
Client			

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	Northwest
Property Tenture	ND
Transaction Type	6
Terrain Type	Suburban
1.0 Property Type	House, Detached
Which Floor	0
2.0 Number of Storeys	2
3.0 Date Built	2025
3.0 Property Age Band	L
4.0 Sheltered Sides	1
5.0 Sunlight/Shade	Average or unknown
6.0 Thermal Mass Parameter	Precise calculation
Thermal Mass	204.75 kJ/m ² K

7.0 Electricity Tariff	Standard
Smart electricity meter fitted	No
Smart gas meter fitted	No

7.0 Measurements		Heat Loss Perimeter	Internal Floor Area	Average Storey Height
	Ground floor:	30.00 m	50.00 m ²	2.50 m
	1st Storey:	30.00 m	50.00 m ²	2.55 m

8.0 Living Area	19.38 m ²
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9.0 External Walls		Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Res	Shelter	Openings	Area Calculation Type
	External Walls	Cavity Wall		Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.18	60.00	145.01	124.99	0.00	None	20.02	Enter Gross Area
	Dormer Walls	Timber Frame		Timber framed wall (one layer of plasterboard)	0.19	9.00	1.89	1.89	0.00	None	0.00	Enter Gross Area

9.2 Internal Walls		Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
	Block		Dense block, plasterboard on dabs	75.00	98.39

10.0 External Roofs		Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Code	Shelter Factor	Calculation Type	Openings
	Roof at Joist	External Plane		Plasterboard, insulated at ceiling level	0.11	9.00	39.20	39.20	None	0.00	Enter Gross Area	0.00
	Roof at Rafter	External Slope		Plasterboard, insulated slope	0.14	9.00	14.12	14.12	None	0.00	Enter Gross Area	0.00

10.2 Internal Ceilings		Description	Storey	Construction	Area (m ²)
	GF		Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	50.00

11.0 Heat Loss Floors		Description	Type	Storey Index	Construction	U-Value (W/m ² K)	Shelter Code	Shelter Factor	Kappa (kJ/m ² K)	Area (m ²)
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Summary for Input Data



Ground Floor Ground Floor - Solid Lowest occupied Suspended concrete floor, carpeted 0.12 None 0.00 75.00 50.00

11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
FF		Plasterboard ceiling, carpeted chipboard floor	18.00	50.00

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Glazing	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.20
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
NW Glazing	Glazing	External Walls	North West	4.19	0
HGD1	Half Glazed Door	External Walls	North West	2.10	0
NE Glazing	Glazing	External Walls	North East	3.91	0
SW Glazing	Glazing	External Walls	South West	0.66	0
SE Glazing	Glazing	External Walls	South East	9.16	0

14.0 Conservatory

15.0 Draught Proofing

%

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E2 Other lintels (including other steel lintels)	Gov Approved Scheme	14.09	0.23	0.23 RCD	No
E3 Sill	Gov Approved Scheme	8.94	0.02	0.02	No
E4 Jamb	Gov Approved Scheme	31.32	0.02	0.02	No
E5 Ground floor (normal)	Gov Approved Scheme	30.00	0.05	0.05	No
E6 Intermediate floor within a dwelling	Gov Approved Scheme	30.00	0.00	0.00	No
E11 Eaves (insulation at rafter level)	Gov Approved Scheme	11.40	0.02	0.02	No
E12 Gable (insulation at ceiling level)	Gov Approved Scheme	16.60	0.04	0.04	No
E13 Gable (insulation at rafter level)	Gov Approved Scheme	9.76	0.04	0.04	No
E16 Corner (normal)	Gov Approved Scheme	20.60	0.04	0.04	No
R6 Flat ceiling	Table K1 - Default	16.10	0.12	0.12	No

Y-value W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys

Number of open flues

Number of chimneys/flues attached to closed fire

Number of flues attached to solid fuel boiler

Number of flues attached to other heater

Number of blocked chimneys

Number of intermittent extract fans

Number of passive vents

Number of flueless gas fires

21.0 Fixed Cooling System

22.0 Pressure Testing

Designed AP₅₀ m³/(h.m²) @ 50 Pa

Property Tested?

Test Method

22.0 Lighting

No Fixed Lighting

Name	Efficacy	Power	Capacity	Count
LED	75.00	10.00	750.00	25

24.0 Main Heating 1

Percentage of Heat %

Summary for Input Data



Database Ref. No.	106396
Fuel Type	Electricity
SAP Code	0
In Winter	279.66
In Summer	177.18
Model Name	Ecodan 8.5kW
Manufacturer	Mitsubishi Electric Europe B.V.
System Type	Heat Pump
Controls SAP Code	2210
Delayed Start Stat	No
HETAS approved System	No
Is MHS Pumped	Pump in heated space
Heating Pump Age	2013 or later
Heat Emitter	Radiators and Underfloor
Underfloor Heating	Yes - Pipes in thin screed
Flow Temperature	Enter value
Flow Temperature Value	45.00

25.0 Main Heating 2

26.0 Heat Networks

27.0 Secondary Heating

28.0 Water Heating

Water Heating	Main Heating 1
SAP Code	901
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
Summer Immersion	No
Cold Water Source	From mains
Bath Count	1
Supplementary Immersion	No
Immersion Only Heating Hot Water	Yes

28.1 Showers

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
Shower 1	Combi boiler or unvented hot water system	11.00		No	
Shower 2	Combi boiler or unvented hot water system	11.00		No	

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder

Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Measured Loss
Cylinder Volume	180.00 L
Loss	1.50 kWh/day
Pipes insulation	Fully insulated primary pipework

Summary for Input Data



In Airing Cupboard

31.0 Thermal Store

32.0 Photovoltaic Unit

Export Capable Meter?

Connected To Dwelling

Diverter

Battery Capacity [kWh]

PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
1.78	South East	30°	None Or Little	No	No	1.00		

34.0 Small-scale Hydro

Electricity Generated

Apportioned kWh/Year

Connected to dwelling's electricity meter

Electricity Generation

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement	
			SAP rating	Environmental Impact
Solar water heating	£4,000 - £7,000	£50	B 87	A 98
			0	0
			0	0

Predicted Energy Assessment

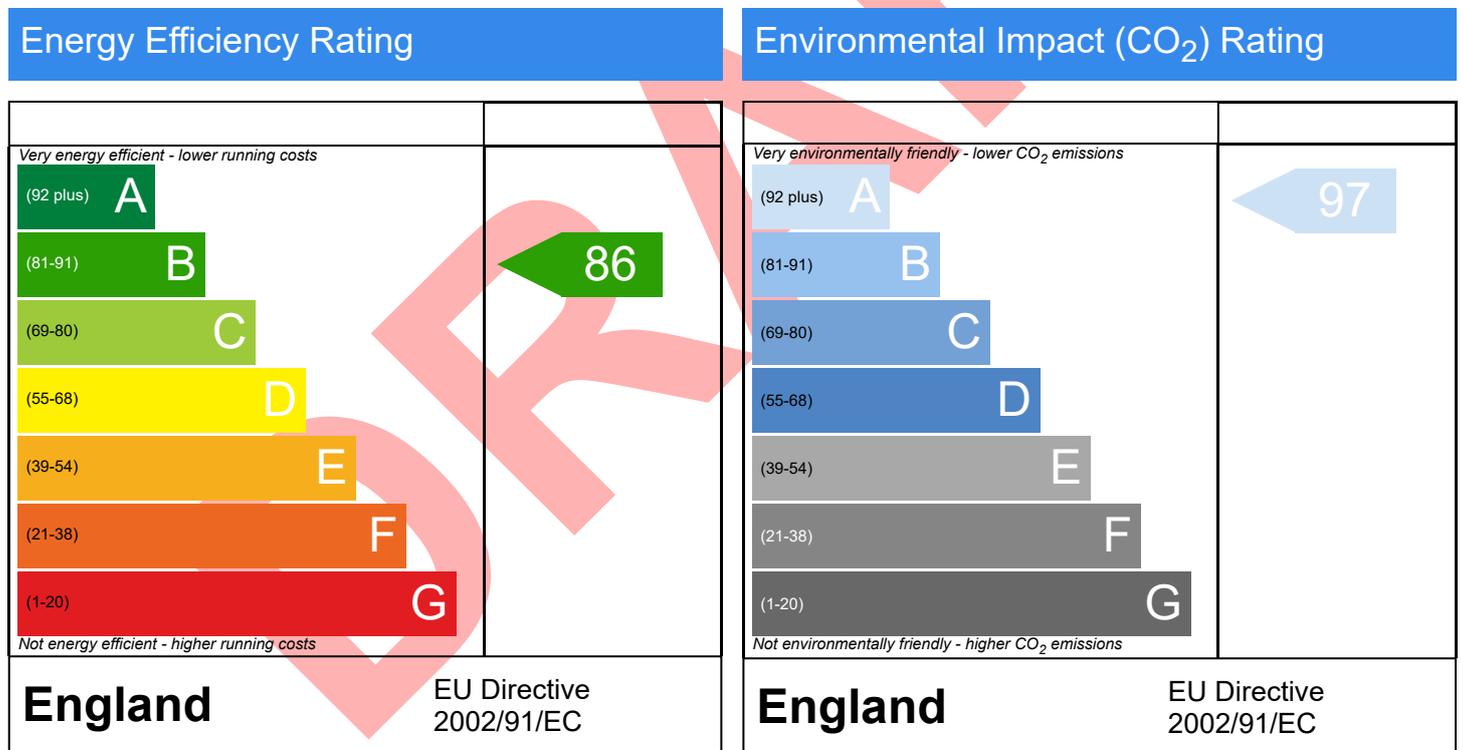


Plot 2, Shatterford

Dwelling type: House, Detached
 Date of assessment: 06/08/2025
 Produced by: Jake Nixon
 Total floor area: 100 m²
 DRRN:

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO₂) emissions.



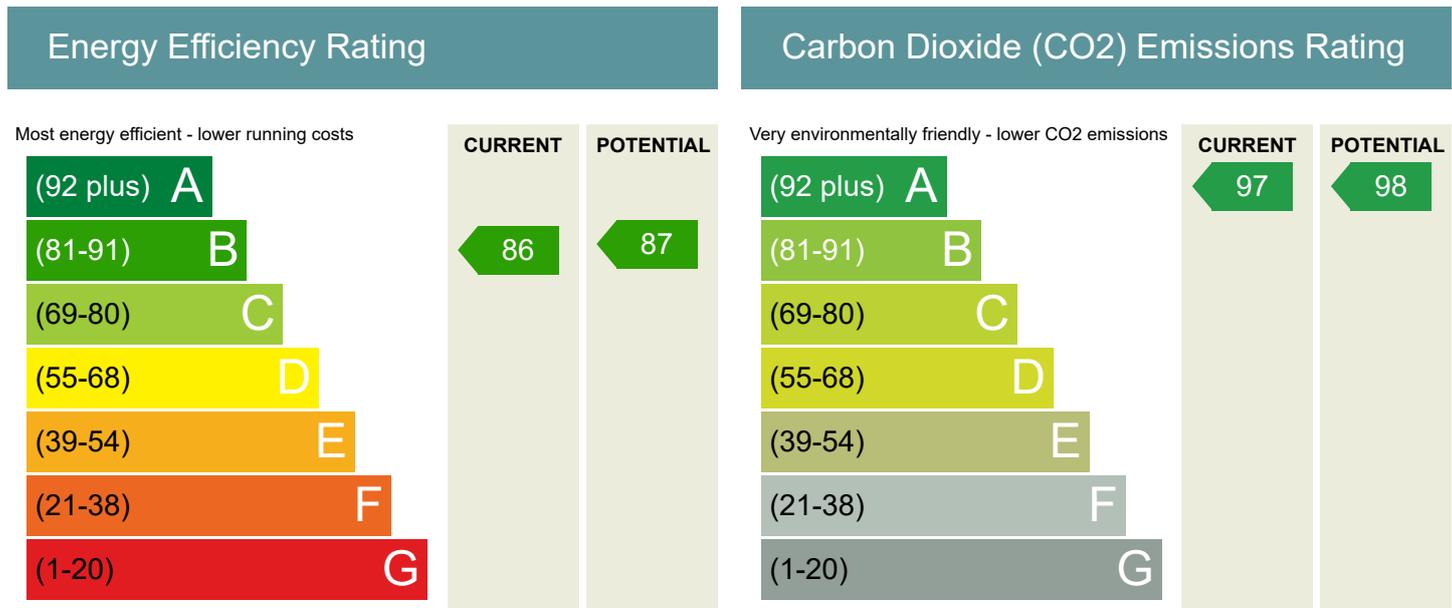
The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

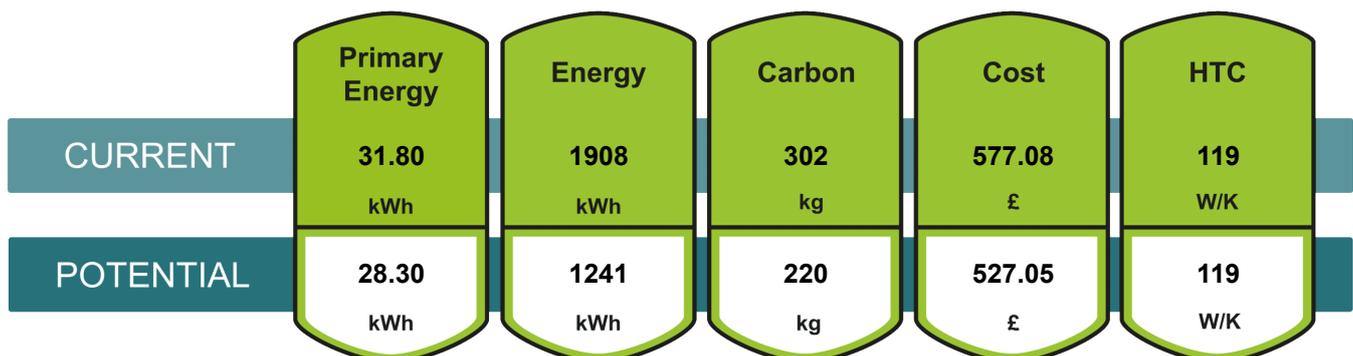
Dwelling Address	Plot 2, Shatterford
Reference	Plot 2-ASHP + PV
Assessment Date	03/04/2025
Submission Date	
Property Type	House, Detached
Total Floor Area	100

This Energy Report has been generated using the UK's National Calculation Methodology for dwellings, Standard Assessment Procedure (SAP). This methodology is used to assess the energy efficiency of dwellings which is calculated based on a dwelling's heating, hot water, ventilation and lighting usage.

This document is not an Energy Performance Certificate (EPC) as required by the Energy Performance of Buildings Regulations



Additional ratings for your home



Breakdown of property's energy performance

Each feature is assessed as one of the following:



Feature	Description	Energy Performance
Walls	Average thermal transmittance 0.18 W/m ² K	Very Good
Roof	Average thermal transmittance 0.12 W/m ² K	Very Good
Floor	Average thermal transmittance 0.12 W/m ² K	Very Good
Windows	High performance glazing	Very Good
Main heating	Air source heat pump, radiators and underfloor, electric	Good
Main heating controls	Programmer, room thermostat and TRVs	Good
Secondary heating	None	
Hot water	From main system	Average
Lighting	Good lighting efficiency	Good
Air tightness	Air permeability [AP50] = 6.1 m ³ /h.m ² (assumed)	Good

Recommendations

The recommended measures provided below will help to improve the energy efficiency of the dwelling. To reach the dwelling's potential energy rating all of the recommended measures shown below would need to be installed. Having these measures installed individually or in any other order may give a different result when compared with the cumulative potential rating.

Recommended measures	Cumulative savings (per year)	Cumulative rating	Typical costs	Incremental savings (per year)	Cumulative CO2 rating
Solar water heating	£50	 B 87	£4,000 - £7,000	£50	 A 98

The typical cost is based on average installation prices across the country so may not be representative of the actual costs in your area.

Estimated energy costs of the dwelling

The table below shows the estimated running costs of the space and water heating and lighting within the dwelling. It does not include the energy used from household appliances. The estimated annual costs after potential improvements indicates the total energy cost if all recommended measures named above were installed.

		Estimated annual costs	Estimated annual costs after potential improvements	Potential future savings
Lighting		£64	£64	
Heating		£344	£368	
Hot Water		£419	£379	
New Technologies e.g. Impact of PV		-(£251)	-(£284)	
TOTAL		£577	£527	

Estimated energy use and potential savings



Space Heating

1211

kWh per year



Water Heating

1474

kWh per year

About this document

Created by:	
Company/Trading name:	
Phone number:	
Email address:	

Disclaimer

This Energy Report should not under any circumstances be treated as a Condition Survey and cannot be used to indicate that any element of the dwelling (e.g.heating system) is working correctly.
This Energy Report must not be used in situations where an Energy Performance Certificate (EPC) is required.
This Energy Report is generated from a set of data inputs which may not reflect the actual dimensions, services or construction of the dwelling.
The calculation used to generate this report reflects the SAP Methodology current at the time of report generation.

Glossary terms for additional metrics

Primary Energy	The measure of the energy required for lighting, heating and hot water in a property. This includes the efficiency of the property's heating system, power station efficiency for electricity and the energy used to produce the fuel and deliver it to the property.
Energy Used	The estimated amount of fuel energy for lighting, heating and hot water for the property. The estimate is based on typical usage which is likely to be different to actual consumption.
Carbon (CO ₂)	The current emissions based on the energy estimates.
Cost	The estimated cost of energy. The cost of each unit of fuel is based on an industry standard which is likely to be different to those the occupier actually pays.
Heat Transfer Coefficient	Heat flow through the property envelope where internal and external temperatures are different.