



88 St Paul's Road, Haringey, N17

Energy Statement for Planning

Job No: 6703

Issued: June, 2026

Issue No: 6

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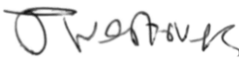
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1.0 Introduction

- 1.1 This Energy Statement has been prepared to support a planning application for the proposed refurbishment of the land rear of 88 St Paul's Road, N17.
- 1.2 The report assesses the predicted energy performance and carbon dioxide emissions of the proposed development in the context of local and London-wide policy requirements and best practice methods.
- 1.3 The methodology used to demonstrate the effects of the proposed energy efficiency measures is the 3-stage Energy Hierarchy expounded by the London Plan, Policy SI 2.
- 1.4 Emissions reductions are shown for the proposed scheme at each of these stages and the strategy underpinning them is detailed in the relevant sections of the report.
- 1.5 The overall effect of these policies are:
 - Minor conversion developments should reduce CO2 emissions as much as feasibly possible

2.0 Project Summary

- 2.1 The proposal site sits to the rear of 88 St Paul's Road, Haringey, N17 and is currently occupied by two, single-storey outbuildings.
- 2.2 The proposal is to convert the one of the existing outbuildings to provide a one bedroom dwelling and demolish the second.
- 2.3 The site location is shown below.



Site Location

3.0 Policy Requirements and Drivers

- 3.1 The relevant planning policy documents for this site, relating to energy are:
- The London Plan (2021)
 - 3.1.1 Policy SI 2 – Minimizing greenhouse gas emissions – minor developments should minimise on-site carbon emissions
 - Haringey Council Local Plan
 - 3.1.2 Local Plan Policy SP4 'Working Towards a Low Carbon Haringey'.
 - 3.1.3 Local Plan Policy CC2.3 'Minimising Energy Use'.
 - National Planning Policy Framework (NPPF 2023)
- 3.2 SP4 of the Haringey Local Plan, 'Working Towards a Low carbon Haringey' states that developments are expected to achieve a 20% reduction in predicted carbon dioxide emissions thorough the use of on-site renewable generation.
- 3.3 SP4 also states that residential buildings are expected to achieve a zero carbon standard. All remaining emissions will therefore need to be offset
- 3.4 In light of these policy requirements and through the developer and design team's commitment to reducing the impact of the development on the environment, this report sets out some of the measures that will be adopted to meet the policy targets

4.0 Energy Strategy and Approach

- 4.1 The London Plan document titled "Energy Assessment Guidance", updated in June 2022 to take into account of the update to building regulations 2021, this provides the parameters by which Energy Statements should be formulated and the approach to be adopted.
- 4.2 The three stages of the hierarchy are referred to as Be Lean (Use Less Energy), Be Clean (Supply Energy Efficiently), Be Green (Use Renewable Energy).
- 4.3 The Be Lean stage of the hierarchy requires development must initially reduce the energy demand of the building through architectural and building fabric measures (passive design) and energy efficient services (active design).
- 4.4 The second part of the hierarchy (Be Clean), is interested in the how their energy systems will exploit local energy resources and supply energy efficiently and cleanly to reduce CO₂.
- 4.5 The third stage is the addition, where feasible, to introduce renewable technology, which includes PV panels, Solar Hot Water panels and Wind Power and renewable heating systems (ASHPs/GSHPs)
- 4.6 The first stage of this process is to establish the baseline emissions on which the reductions will be based.
- 4.7 This is done using SAP (Standard Assessment Procedure) for residential elements.
- 4.8 In doing so three SAP calculations have been undertaken to determine the emissions at baseline (BS), Be Lean (BL) and Be Green (BG) stages these are attached in Appendix A of this report.

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5.0 Baseline Emissions

- 5.1 The baseline emissions on which reduction figures are based are calculated using SAP for residential buildings.
- 5.2 Refurbishments and extensions are based upon a notional specification set out in Appendix 4 of the London Plan Energy Statement Guidance.
- 5.3 As detailed in the London Plan Energy Statement Guidance, the heating/hot water strategy should be the same throughout the stages. The baseline emissions are therefore based on ASHPs.
- 5.4 The baseline emissions are as follows.

Residential Baseline Emissions	
Regulated Emissions	SAP 10 (Tonnes CO ₂ /Year)
	0.6 Tonnes CO ₂

Table 1 – Baseline Emissions

6.0 Be Lean Strategy

- 6.1 The next stage, once the baseline has been established, is to make improvements within the "Be Lean" category. This includes improving the U Values and the reduction of thermal bridging.
- 6.2 The U value improvements for each element, with the relevant Part L notional value are shown below.
- 6.3 Heating and hot water will be provided by an air source heat pump with a efficiency of 170% in accordance with London Plan energy statement guidance.
- 6.4 Lighting can also use significant energy in dwellings, it is proposed that the light fittings will have an efficacy of 110Lm/W.

Be Lean Fabric Specification		
Element or system	Appendix 4 Value	Proposed Value
Existing Floors	U = 0.25 W/(m ² k)	U = 0.15 W/(m ² k)
External walls	U = 0.30 W/(m ² k)	U = 0.20 W/(m ² k)
Roofs	U = 0.15 W/(m ² k)	U = 0.12 W/(m ² k)
Proposed Glazing	U = 1.60 W/(m ² k)	U = 1.20 W/(m ² k)
Air Permeability	15 m ³ /(hm ²) at 50 Pa	8 m ³ /(hm ²) at 50 Pa

Table 2 – Be Lean Fabric Specification

6.0 Be Lean Strategy

Residential - Be Lean Emissions			
	Baseline Emissions	Be Lean Emissions	% Reduction
Regulated Emissions	0.6 Tonnes CO ₂	0.5 Tonnes CO ₂	22%

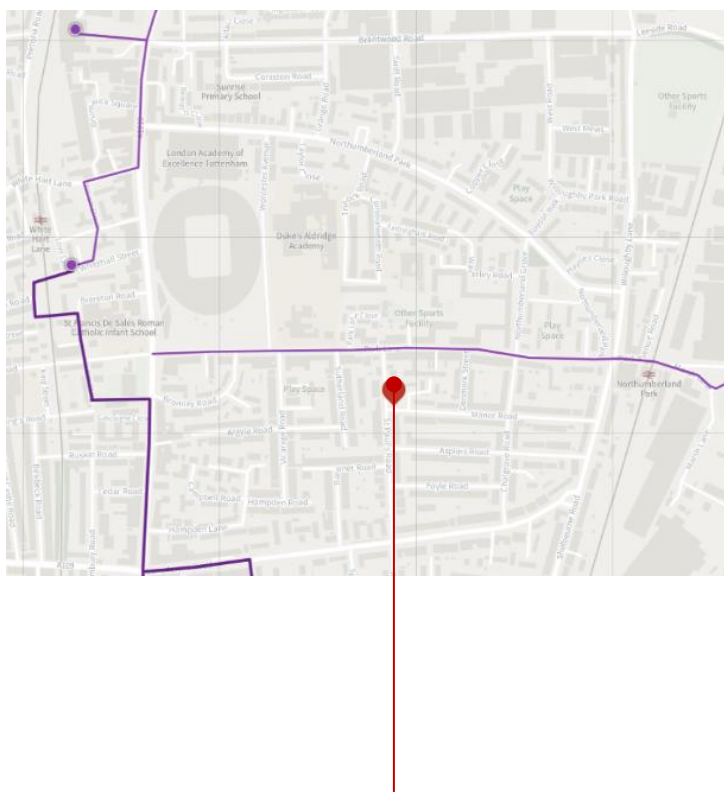
Table 3 –Be Lean Emissions

Fabric Energy Efficiency			
	Target Fabric Energy Efficiency	Dwelling Fabric Energy Efficiency	% Reduction
Fabric Energy Efficiency	126.83	97.01	24%

Table 4 – Fabric Energy Efficiency

7.0 Be Clean Strategy

- 7.1 The Be Clean element of the hierarchy refers to supplying energy in a clean manner. This encompasses the use of energy efficient heating sources (such as heat pumps), decentralised energy and heat networks and the consideration of Combined Heat and Power.
- 7.2 The site is not situated close to any existing decentralised energy or heating network as shown on the map below.
- 7.3 The site sits near a proposed decentralised heat network. Due to lack of centralised plant space future proofing for future connection is not feasible in this instance.
- 7.4 Due to the small scale of the proposal, CHP is also not a viable solution. London Plan guidance suggests that CHP is most suitable for developments of at least 500 units.
- 7.5 As there is no material change at this stage, no improvements on the Be Lean stage have been made.



Site Location

8.0 Be Green Strategy

- 8.1 The Be Green element of the hierarchy requires the consideration of renewable technologies to reduce emissions still further beyond the savings made at the Be Lean and Be Clean stages.
- 8.2 The technologies that are considered here are wind power and solar panels photovoltaic (PV) and renewable heating technology.
- 8.3 Wind power is not suitable in a location such as this. Wind turbines tend to perform poorly in built-up areas.
- 8.4 Any wind that is received on the site would be too intermittent and turbulent to provide any meaningful reduction in emissions.
- 8.5 Air source heat pumps with an efficiency of 252% are proposed for the development.
- 8.6 It is proposed that 8 0.45kWp PV panels will be installed on site. This provides an overall kWp of 4.6.

9.0 Summary Of Results

- 9.1 The table below give the percentage improvement in emissions at each stage of the hierarchy and the overall savings made over Part L of the Building Regulations.
- 9.2 The building will be provided with increased U values (as shown above), , Improved lighting, electric boilers and PV panels.

Red Lion House	Carbon Dioxide Emissions (Tonnes CO2 per annum)	% Reduction
Baseline: Part L 2021 of the Building Regulations Compliant Development	0.6	
After energy demand reduction	0.5	22%
After heat network / CHP	0.5	0%
After renewable energy	-0.0011	80%
Total Savings	0.6011	102%

Table 5 - Summary of Results

10.0 Conclusions

- 10.1 This report has been set out to demonstrate how the proposed development at 88 St Pauls Road, N17 will meet the policy requirement of achieving the maximum feasible reduction in emissions through the Be Lean, Be Clean, Be Green hierarchy.
- 10.2 In doing so, preliminary SAP calculations have been undertaken using the information available and sensible assumptions on construction and M&E parameters.
- 10.3 The baseline figures have been calculated and improvements made to the fabric of the scheme, in addition to other measures listed below.
- 10.4 The measures at the Be Lean are detailed above but can be summarised as:
- Energy efficient lighting
 - Improved U-values
- 10.5 The Measures at the Be Green stage can be summarised as:
- Air Source heat pump with an efficiency of 252%
 - 3.6kWp of PV.
- 10.6 The results in Section 9 show that a 102% reduction in CO₂ emissions is achieved.
- 10.7 The total remaining emissions are 0.00 tonnes.
- 10.8 The required offset payment in Haringey is currently £95 per tonne over 30 years. Therefore, the total offset payment is $(0.0 \times 95 \times 30) = £0.00$



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Appendix A – SAP Calculations

Summary for Input Data



Plot Reference	88 St Pauls - conversion - R2		Issued on Date	02/06/2026
Assessment Reference	88 St Pauls - BS	Plot Type Ref		
Plot Address			SAP Version	10.2

SAP Rating	53 E	DER	15.96	TER	
Environmental	90 B	% DER < TER			N/A
CO ₂ Emissions (t/year)	0.56	DFEE	126.83	TFEE	
Compliance Check	N/A	% DFEE < TFEE			
% DPER < TPER		DPER	165.50	TPER	

Assessor Details	Mr. Samuel Westover	Assessor ID	AX13-0001
Client			

SUMMARY FOR INPUT DATA FOR: Conversion (As Designed)

Orientation	South	
Property Tenture	ND	
Transaction Type	6	
Terrain Type	Urban	
1.0 Property Type	Bungalow, Semi-Detached	
2.0 Number of Storeys	1	
3.0 Date Built	2024	
4.0 Sheltered Sides	2	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Enter TMP value	
Thermal Mass	170.00	kJ/m²

7.0 Electricity Tariff	Standard
Smart electricity meter fitted	Yes
Smart gas meter fitted	Yes

7.0 Measurements				
	Ground floor:	Heat Loss Perimeter 25.90 m	Internal Floor Area 39.50 m²	Average Storey Height 3.00 m

8.0 Living Area	28.80	m²
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Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Res	Shelter	Openings	Area Calculation Type
EW	Cavity Wall	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.30		77.70	64.20	0.00	None	13.50	Calculate Wall Area

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)	Shelter Res	Shelter
Party Wall 1	Filled Cavity with Edge Sealing	Plasterboard on dabs mounted on cement render on both sides, AAC blocks, cavity	0.00		23.70	0.00	None

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Wall 1	Plasterboard on timber frame		139.20

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Code	Shelter Factor	Calculation Type	Openings
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.15	9.00	39.50	39.50	None	0.00	Calculate Wall Area	0.00

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Heatloss Floor 1	Ground Floor - Solid	Lowest occupied	Suspended concrete floor, carpeted	0.25	None	0.00	75.00	39.30

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
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Summary for Input Data

Windows	Manufacturer	Window	Double Low-E Soft 0.05	0.63	0.70	1.60
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13.0 Openings

Name	Opening Type	Location	Orientation	Area (m ²)	Pitch
S	Windows	EW	South	1.20	
N	Windows	EW	North	2.30	
E	Windows	EW	East	10.00	

14.0 Conservatory

None

15.0 Draught Proofing

100

 %

16.0 Draught Lobby

No

17.0 Thermal Bridging

Default

17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E5 Ground floor (normal)		44.60			Yes
E6 Intermediate floor within a dwelling		15.90			Yes
E16 Corner (normal)		33.00			No
E18 Party wall between dwellings		6.00			No
E1 Steel lintel with perforated steel base plate		16.60			No
E3 Sill		5.80			No
E4 Jamb		40.00			No
E14 Flat roof		36.60			No

Y-value

0.20

 W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

No

20.0 Fans, Open Fireplaces, Flues

0

0

0

0

0

0

2

0

0

21.0 Fixed Cooling System

No

22.0 Pressure Testing

No

22.0 Lighting

No Fixed Lighting

No

Name	Efficacy	Power	Capacity	Count
Lighting 1	90.00	5.00	450.00	20

24.0 Main Heating 1

SAP table

100.00

 %

Electricity

214

In Winter

170.00

In Summer

170.00

Controls SAP Code

2207

Controls description

Time and temperature zone control by arrangement

Is MHS Pumped

Pump in heated space

Heating Pump Age

2013 or later

Heat Emitter

Underfloor

Underfloor Heating

Yes - Pipes in thin screed

Flow Temperature

Enter value

Summary for Input Data

Flow Temperature Value	35.00
25.0 Main Heating 2	None
26.0 Heat Networks	None
27.0 Secondary Heating	None
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
Cold Water Source	From mains
Bath Count	1
Supplementary Immersion	No
Immersion Only Heating Hot Water	No

28.1 Showers					
Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
S1	Vented hot water system + pump	9.00		No	
S2	Vented hot water system + pump	9.00		No	

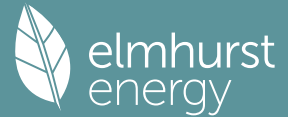
28.3 Waste Water Heat Recovery System	
29.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Measured Loss
Cylinder Volume	110.00
Loss	0.89
Pipes insulation	Fully insulated primary pipework

31.0 Thermal Store	None
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34.0 Small-scale Hydro	None										
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Recommendations					
Lower cost measures					
None					
Further measures to achieve even higher standards					
		Typical Cost	Typical savings per year	Ratings after improvement	Environmental Impact
Solar water heating		£4,000 - £7,000	£89	SAP rating D 56	B 91
Photovoltaic		£8,000 - £10,000	£277	C 69	A 94
Wind turbine				0	0

Full SAP Calculation Printout



Plot Reference	88 St Pauls - conversion - R2				Issued on Date	02/06/2026	
Assessment Reference	88 St Pauls - BS			Plot Type Ref			
Plot Address					SAP Version	10.2	
SAP Rating		53 E	DER	15.96	TER		
Environmental		90 B	% DER < TER			N/A	
CO ₂ Emissions (t/year)		0.56	DFEE	126.83	TFEE		
Compliance Check		N/A	% DFEE < TFEE				
% DPER < TPER			DPER	165.50	TPER		
Assessor Details	Mr. Samuel Westover				Assessor ID	AX13-0001	
Client							

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	39.5000 (1b)	3.0000 (2b)	118.5000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.5000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	118.5000 (5)

2. Ventilation rate

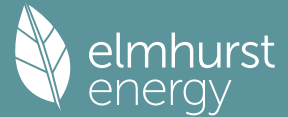
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c)	20.0000 / (5) = 0.1688 (8)
Pressure test	No
Pressure Test Method	Blower Door
Measured/design AP50	15.0000 (17)
Infiltration rate	0.9188 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.7810 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.9957	0.9762	0.9567	0.8591	0.8395	0.7419	0.7419	0.7224	0.7810	0.8395	0.8786	0.9176 (22b)
Effective ac	0.9957	0.9765	0.9576	0.8690	0.8524	0.7752	0.7752	0.7609	0.8049	0.8524	0.8860	0.9210 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
Windows			13.5000	1.5038	20.3008		(27)
Heatloss Floor 1			39.3000	0.2500	9.8250		(28a)
EW	77.7000	13.5000	64.2000	0.3000	19.2600		(29a)
Flat Roof	39.5000		39.5000	0.1500	5.9250		(30)
Total net area of external elements Aum(A, m ²)			156.5000				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	55.3108		(33)
Main dwelling							
Party Wall 1			23.7000	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							170.0000 (35)
Thermal bridges (Default value 0.200 * total exposed area)							31.3000 (36)
Point Thermal bridges						(36a) =	0.0000
Total fabric heat loss						(33) + (36) + (36a) =	86.6108 (37)
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)							
(38)m	38.9381	38.1854	37.4475	33.9818	33.3334	30.3148	30.3148
Heat transfer coeff	125.5489	124.7961	124.0583	120.5925	119.9441	116.9256	116.9256
Average = Sum(39)m / 12 =							122.6273 (39)
							120.5894

Full SAP Calculation Printout



HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP (average)	3.1785	3.1594	3.1407	3.0530	3.0366	2.9601	2.9601	2.9460	2.9896	3.0366	3.0698	3.1045	(40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													1.3931 (42)
Hot water usage for mixer showers													
53.5244	52.7201	51.5480	49.3053	47.6503	45.8046	44.7556	45.9188	47.1940	49.1756	51.4664	53.3194	(42a)	
Hot water usage for baths													
20.5830	20.2773	19.8469	19.0532	18.4588	17.7998	17.4439	17.8713	18.3367	19.0419	19.8520	20.5134	(42b)	
Hot water usage for other uses													
28.8968	27.8461	26.7953	25.7445	24.6937	23.6429	23.6429	24.6937	25.7445	26.7953	27.8461	28.8968	(42c)	
Average daily hot water use (litres/day)													94.7013 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	103.0043	100.8435	98.1901	94.1029	90.8028	87.2473	85.8423	88.4838	91.2752	95.0128	99.1645	102.7297	(44)
Energy content (annual)	163.1337	143.5998	150.9145	128.8222	122.2380	107.2808	103.8188	109.5614	112.5514	128.9315	141.2780	160.8498	(45)
Distribution loss (46)m = 0.15 x (45)m										Total = Sum(45)m =		1572.9798	
24.4700	21.5400	22.6372	19.3233	18.3357	16.0921	15.5728	16.4342	16.8827	19.3397	21.1917	24.1275	(46)	
Water storage loss (or HIU loss):													
Store volume													110.0000 (47)
a) If manufacturer declared loss factor is known (kWh/day):													0.8900 (48)
Temperature factor from Table 2b													0.5400 (49)
Enter (49) or (54) in (55)													0.4806 (55)
Total storage loss													
14.8986	13.4568	14.8986	14.4180	14.8986	14.4180	14.8986	14.8986	14.4180	14.8986	14.4180	14.8986	(56)	
If cylinder contains dedicated solar storage													
14.8986	13.4568	14.8986	14.4180	14.8986	14.4180	14.8986	14.8986	14.4180	14.8986	14.4180	14.8986	(57)	
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624	(59)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(61)
Total heat required for water heating calculated for each month													
201.2947	178.0678	189.0755	165.7522	160.3990	144.2108	141.9798	147.7224	149.4814	167.0925	178.2080	199.0108	(62)	
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63d)
Output from w/h													
201.2947	178.0678	189.0755	165.7522	160.3990	144.2108	141.9798	147.7224	149.4814	167.0925	178.2080	199.0108	(64)	
12Total per year (kWh/year)													2022.2948 (64)
Electric shower(s)													2022 (64)
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000	(64a)
Heat gains from water heating, kWh/month													
84.7707	75.3213	80.7079	72.3774	71.1729	65.2149	65.0486	66.9580	66.9673	73.3985	76.5189	84.0114	(65)	

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5												
	60.6664	67.1664	60.6664	62.6886	60.6664	62.6886	60.6664	60.6664	62.6886	60.6664	62.6886	60.6664 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5												
	120.2780	121.5261	118.3809	111.6852	103.2330	95.2891	89.9821	88.7340	91.8792	98.5750	107.0272	114.9710 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5												
	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656 (69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)												
	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244 (71)
Water heating gains (Table 5)												
	113.9392	112.0853	108.4783	100.5241	95.6626	90.5762	87.4309	89.9973	93.0102	98.6539	106.2763	112.9185 (72)
Total internal gains												
	341.7803	347.6745	334.4223	321.7946	306.4586	292.4506	281.9761	283.2944	291.4747	304.7920	322.8887	335.4526 (73)

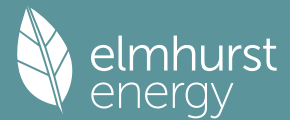
6. Solar gains

[Jan]				Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b		FF Specific data or Table 6c		Access factor Table 6d		Gains W
North				2.3000	10.6334	0.6300		0.7000		0.7700		7.4743 (74)
East				10.0000	19.6403	0.6300		0.7000		0.7700		60.0232 (76)
South				1.2000	46.7521	0.6300		0.7000		0.7700		17.1456 (78)
Solar gains	84.6432	159.7821	253.4117	361.4333	440.2717	450.5741	428.9440	369.4551	291.4459	186.6166	104.3858	70.4065 (83)
Total gains	426.4234	507.4565	587.8340	683.2280	746.7304	743.0247	710.9201	652.7495	582.9206	491.4085	427.2746	405.8591 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	14.8570	14.9466	15.0355	15.4676	15.5512	15.9527	15.9527	16.0293	15.7956	15.5512	15.3830	15.2110
alpha	1.9905	1.9964	2.0024	2.0312	2.0367	2.0635	2.0635	2.0686	2.0530	2.0367	2.0255	2.0141
util living area	0.9663	0.9513	0.9257	0.8735	0.7928	0.6760	0.5605	0.6054	0.7765	0.9034	0.9529	0.9693 (86)
MIT	17.7786	18.0582	18.5481	19.2456	19.8739	20.3875	20.6333	20.5875	20.1707	19.3515	18.4781	17.7746 (87)
Th 2	18.6634	18.6724	18.6813	18.7237	18.7318	18.7701	18.7701	18.7772	18.7552	18.7318	18.7155	18.6987 (88)
util rest of house	0.9561	0.9367	0.9020	0.8294	0.7106	0.5257	0.3283	0.3793	0.6526	0.8597	0.9361	0.9601 (89)

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MIT 2	15.2443	15.5951	16.2053	17.0709	17.7993	18.3488	18.5333	18.5197	18.1611	17.2294	16.1456	15.2533 (90)
Living area fraction									FLA = Living area / (4) =			0.7291 (91)
MIT	17.0921	17.3910	17.9134	18.6565	19.3120	19.8352	20.0645	20.0273	19.6263	18.7766	17.8462	17.0916 (92)
Temperature adjustment												0.0000
adjusted MIT	17.0921	17.3910	17.9134	18.6565	19.3120	19.8352	20.0645	20.0273	19.6263	18.7766	17.8462	17.0916 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9465	0.9257	0.8917	0.8278	0.7353	0.6065	0.4763	0.5209	0.7096	0.8608	0.9273	0.9511	(94)
Useful gains	403.6305	469.7338	524.1560	565.6010	549.1034	450.6544	338.6283	340.0336	413.6332	423.0072	396.1995	386.0235	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	1606.0366	1558.8263	1415.9316	1176.5636	913.0102	612.1346	405.0869	422.0995	652.5951	980.7387	1303.0443	1580.8669	(97)
Space heating kWh	894.5901	731.8702	663.4810	439.8931	270.7466	0.0000	0.0000	0.0000	0.0000	414.9523	652.9283	888.9635	(98a)
Space heating requirement - total per year (kWh/year)												4957.4251	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	894.5901	731.8702	663.4810	439.8931	270.7466	0.0000	0.0000	0.0000	0.0000	414.9523	652.9283	888.9635	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												4957.4251	
Space heating per m2										(98c) / (4) =		125.5044	(99)

9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													170.0000 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	894.5901	731.8702	663.4810	439.8931	270.7466	0.0000	0.0000	0.0000	0.0000	414.9523	652.9283	888.9635	(98)
Space heating efficiency (main heating system 1)	170.0000	170.0000	170.0000	170.0000	170.0000	0.0000	0.0000	0.0000	0.0000	170.0000	170.0000	170.0000	(210)
Space heating fuel (main heating system)	526.2295	430.5119	390.2830	258.7606	159.2627	0.0000	0.0000	0.0000	0.0000	244.0896	384.0755	522.9197	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	201.2947	178.0678	189.0755	165.7522	160.3990	144.2108	141.9798	147.7224	149.4814	167.0925	178.2080	199.0108	(64)
Efficiency of water heater													170.0000 (216)
(217)m	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	(217)
Fuel for water heating, kWh/month	118.4086	104.7457	111.2209	97.5013	94.3524	84.8299	83.5175	86.8955	87.9302	98.2897	104.8282	117.0652	(219)
Space cooling fuel requirement													
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(231)
Lighting	12.1186	9.7220	8.7536	6.4133	4.9538	4.0473	4.5190	5.8740	7.6297	10.0106	11.3069	12.4554	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1													2916.1324 (211)
Space heating fuel - main system 2													0.0000 (213)
Space heating fuel - secondary													0.0000 (215)
Efficiency of water heater													170.0000
Water heating fuel used													1189.5852 (219)
Space cooling fuel													0.0000 (221)
Electricity for pumps and fans:													
Total electricity for the above, kWh/year													0.0000 (231)
Electricity for lighting (calculated in Appendix L)													97.8042 (232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation													0.0000 (233)
Wind generation													0.0000 (234)
Hydro-electric generation (Appendix N)													0.0000 (235a)
Electricity generated - Micro CHP (Appendix N)													0.0000 (235)
Appendix Q - special features													
Energy saved or generated													-0.0000 (236)
Energy used													0.0000 (237)
Total delivered energy for all uses													4203.5218 (238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	2916.1324	0.1539	448.8235	(261)
Total CO2 associated with community systems			0.0000	(373)

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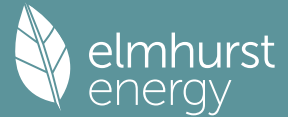


Water heating (other fuel)	1189.5852	0.1409	167.6618 (264)
Space and water heating			616.4854 (265)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (267)
Energy for lighting	97.8042	0.1443	14.1162 (268)
Total CO ₂ , kg/year			630.6015 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			15.9600 (273)

----- 13a. Primary energy - Individual heating systems including micro-CHP -----

	Energy kWh/year	Primary energy factor kg CO ₂ /kWh	Primary energy kWh/year
Space heating - main system 1	2916.1324	1.5698	4577.7796 (275)
Total CO ₂ associated with community systems			0.0000 (473)
Water heating (other fuel)	1189.5852	1.5212	1809.5404 (278)
Space and water heating			6387.3200 (279)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (281)
Energy for lighting	97.8042	1.5338	150.0154 (282)
Total Primary energy kWh/year			6537.3354 (286)
Dwelling Primary energy Rate (DPER)			165.5000 (287)

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Plot Reference	88 St Pauls - conversion - R2				Issued on Date	02/06/2026	
Assessment Reference	88 St Pauls - BS			Plot Type Ref			
Plot Address					SAP Version	10.2	
SAP Rating		53 E	DER	15.96	TER		
Environmental		90 B	% DER < TER			N/A	
CO ₂ Emissions (t/year)		0.56	DFEE	126.83	TFEE		
Compliance Check		N/A	% DFEE < TFEE				
% DPER < TPER			DPER	165.50	TPER		
Assessor Details	Mr. Samuel Westover				Assessor ID	AX13-0001	
Client							

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF FABRIC ENERGY EFFICIENCY

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	39.5000 (1b)	3.0000 (2b)	118.5000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.5000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	118.5000 (5)

2. Ventilation rate

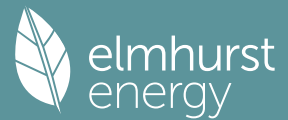
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) = 0.1688 (8)
Pressure test	No
Pressure Test Method	Blower Door
Measured/design AP50	15.0000 (17)
Infiltration rate	0.9188 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.7810 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.9957	0.9762	0.9567	0.8591	0.8395	0.7419	0.7419	0.7224	0.7810	0.8395	0.8786	0.9176 (22b)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)												0.0000 (23b)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												0.0000 (23c)
Effective ac	0.9957	0.9765	0.9576	0.8690	0.8524	0.7752	0.7752	0.7609	0.8049	0.8524	0.8860	0.9210 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
Windows			13.5000	1.5038	20.3008		(27)
Heatloss Floor 1			39.3000	0.2500	9.8250		(28a)
EW	77.7000	13.5000	64.2000	0.3000	19.2600		(29a)
Flat Roof	39.5000		39.5000	0.1500	5.9250		(30)
Total net area of external elements Aum(A, m ²)			156.5000				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	55.3108		(33)
Main dwelling							
Party Wall 1			23.7000	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							170.0000 (35)
Thermal bridges (Default value 0.200 * total exposed area)							31.3000 (36)
Point Thermal bridges						(36a) =	0.0000
Total fabric heat loss						(33) + (36) + (36a) =	86.6108 (37)
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)							
(38)m	38.9381	38.1854	37.4475	33.9818	33.3334	30.3148	30.3148
Heat transfer coeff							

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Average = Sum(39)m / 12 =	125.5489	124.7961	124.0583	120.5925	119.9441	116.9256	116.9256	116.3666	118.0883	119.9441	121.2559	122.6273 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	3.1785	3.1594	3.1407	3.0530	3.0366	2.9601	2.9601	2.9460	2.9896	3.0366	3.0698	3.1045 (40)
HLP (average)												3.0529
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.3931 (42)
Hot water usage for mixer showers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42a)
Hot water usage for baths	20.5830	20.2773	19.8469	19.0532	18.4588	17.7998	17.4439	17.8713	18.3367	19.0419	19.8520	20.5134 (42b)
Hot water usage for other uses	28.8968	27.8461	26.7953	25.7445	24.6937	23.6429	23.6429	24.6937	25.7445	26.7953	27.8461	28.8968 (42c)
Average daily hot water use (litres/day)												45.3536 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	49.4799	48.1234	46.6421	44.7976	43.1525	41.4427	41.0867	42.5650	44.0812	45.8372	47.6980	49.4103 (44)
Energy conte	78.3640	68.5271	71.6872	61.3257	58.0916	50.9586	49.6908	52.7043	54.3565	62.2006	67.9546	77.3646 (45)
Energy content (annual)										Total = Sum(45)m =		753.2256
Distribution loss (46)m = 0.15 x (45)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (46)
Water storage loss (or HIU loss):												
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
If cylinder contains dedicated solar storage												
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (61)
Total heat required for water heating calculated for each month												
	66.6094	58.2480	60.9341	52.1268	49.3778	43.3148	42.2372	44.7987	46.2031	52.8705	57.7614	65.7599 (62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)
Output from w/h	66.6094	58.2480	60.9341	52.1268	49.3778	43.3148	42.2372	44.7987	46.2031	52.8705	57.7614	65.7599 (64)
12Total per year (kWh/year)								Total per year (kWh/year) = Sum(64)m =				640.2418 (64)
Electric shower(s)	38.1015	33.9487	37.0707	35.3761	36.0399	34.3786	35.5246	36.0399	35.3761	37.0707	36.3736	38.1015 (64a)
								Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =				433.4021 (64a)
Heat gains from water heating, kWh/month	26.1777	23.0492	24.5012	21.8757	21.3544	19.4234	19.4404	20.2097	20.3948	22.4853	23.5338	25.9653 (65)

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts												
(66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5												
	60.6664	67.1664	60.6664	62.6886	60.6664	62.6886	60.6664	60.6664	62.6886	60.6664	62.6886	60.6664 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5												
	120.2780	121.5261	118.3809	111.6852	103.2330	95.2891	89.9821	88.7340	91.8792	98.5750	107.0272	114.9710 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5												
	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656 (69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)												
	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244 (71)
Water heating gains (Table 5)												
	35.1851	34.2994	32.9317	30.3830	28.7022	26.9769	26.1296	27.1635	28.3261	30.2222	32.6858	34.8996 (72)
Total internal gains	260.0262	266.8885	255.8757	248.6534	236.4983	228.8513	220.6749	220.4606	226.7906	233.3603	246.2982	254.4338 (73)

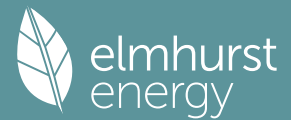
6. Solar gains

[Jan]												
	Area	Solar flux	Specific data	Specific FF	Access	Gains						
	m2	Table 6a	g	or Table 6c	factor	W						
		W/m2	or Table 6b		Table 6d							
North	2.3000	10.6334	0.6300	0.7000	0.7700	7.4743 (74)						
East	10.0000	19.6403	0.6300	0.7000	0.7700	60.0232 (76)						
South	1.2000	46.7521	0.6300	0.7000	0.7700	17.1456 (78)						
Solar gains	84.6432	159.7821	253.4117	361.4333	440.2717	450.5741	428.9440	369.4551	291.4459	186.6166	104.3858	70.4065 (83)
Total gains	344.6694	426.6706	509.2874	610.0868	676.7700	679.4254	649.6189	589.9157	518.2365	419.9768	350.6841	324.8403 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	14.8570	14.9466	15.0355	15.4676	15.5512	15.9527	15.9527	16.0293	15.7956	15.5512	15.3830	15.2110
alpha	1.9905	1.9964	2.0024	2.0312	2.0367	2.0635	2.0635	2.0686	2.0530	2.0367	2.0255	2.0141
util living area	0.9769	0.9639	0.9414	0.8934	0.8179	0.7055	0.5925	0.6409	0.8080	0.9250	0.9668	0.9795 (86)
MIT	16.7252	17.1062	17.7747	18.7320	19.6019	20.3220	20.6735	20.6027	20.0067	18.8630	17.6689	16.7156 (87)
Th 2	18.6634	18.6724	18.6813	18.7237	18.7318	18.7701	18.7701	18.7772	18.7552	18.7318	18.7155	18.6987 (88)
util rest of house												
	0.9698	0.9527	0.9219	0.8545	0.7412	0.5575	0.3543	0.4113	0.6921	0.8891	0.9544	0.9732 (89)
MIT 2	15.0952	15.4748	16.1349	17.0780	17.8813	18.4958	18.7107	18.6914	18.2760	17.2341	16.0590	15.1033 (90)
Living area fraction									fLA = Living area / (4) =			0.7291 (91)

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MIT	16.2836	16.6643	17.3305	18.2840	19.1359	19.8273	20.1418	20.0850	19.5379	18.4217	17.2328	16.2789 (92)
Temperature adjustment												0.0000
adjusted MIT	16.2836	16.6643	17.3305	18.2840	19.1359	19.8273	20.1418	20.0850	19.5379	18.4217	17.2328	16.2789 (93)

8. Space heating requirement

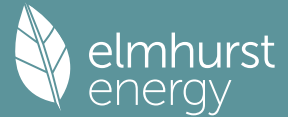
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9585	0.9383	0.9059	0.8447	0.7578	0.6373	0.5155	0.5625	0.7413	0.8823	0.9423	0.9629 (94)
Useful gains	330.3527	400.3451	461.3510	515.3618	512.8243	433.0280	334.8867	331.8286	384.1697	370.5375	330.4574	312.7760 (95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000 (96)
Heat loss rate W	1504.5317	1468.1332	1343.6148	1131.6353	891.8866	611.2093	414.1276	428.8076	642.1531	938.1689	1228.6591	1481.1974 (97)
Space heating kWh	873.5892	717.5536	656.4043	443.7169	282.0223	0.0000	0.0000	0.0000	0.0000	422.3177	646.7052	869.3056 (98a)
Space heating requirement - total per year (kWh/year)												4911.6148
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (98b)
Solar heating contribution - total per year (kWh/year)												0.0000
Space heating kWh	873.5892	717.5536	656.4043	443.7169	282.0223	0.0000	0.0000	0.0000	0.0000	422.3177	646.7052	869.3056 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												4911.6148
Space heating per m2										(98c) / (4) =		124.3447 (99)

8c. Space cooling requirement

Calculated for June, July and August. See Table 10b

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ext. temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000
Heat loss rate W	0.0000	0.0000	0.0000	0.0000	0.0000	1099.1006	865.2494	884.3863	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.5507	0.6198	0.5780	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	605.2562	536.2406	511.2028	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	773.7665	740.1440	671.5023	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	121.3274	151.7042	119.2628	0.0000	0.0000	0.0000	0.0000 (104)
Cooled fraction									fc = cooled area / (4) =			1.0000 (105)
Intermittency factor (Table 10b)	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500 (106)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	30.3319	37.9260	29.8157	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												98.0736 (107)
Energy for space heating												124.3447 (99)
Energy for space cooling												2.4829 (108)
Total												126.8276 (109)
Fabric Energy Efficiency (DFEE)												126.8 (109)

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Plot Reference	88 St Pauls - conversion - R2				Issued on Date	02/06/2026	
Assessment Reference	88 St Pauls - BS			Plot Type Ref			
Plot Address					SAP Version	10.2	
SAP Rating		53 E	DER	15.96	TER		
Environmental		90 B	% DER < TER			N/A	
CO ₂ Emissions (t/year)		0.56	DFEE	126.83	TFEE		
Compliance Check		N/A	% DFEE < TFEE				
% DPER < TPER			DPER	165.50	TPER		
Assessor Details	Mr. Samuel Westover				Assessor ID	AX13-0001	
Client							

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	39.5000 (1b)	3.0000 (2b)	118.5000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.5000		118.5000 (4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	118.5000 (5)

2. Ventilation rate

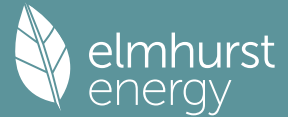
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c)	20.0000 / (5) = 0.1688 (8)
Pressure test	No
Pressure Test Method	Blower Door
Measured/design AP50	15.0000 (17)
Infiltration rate	0.9188 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.7810 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.9957	0.9762	0.9567	0.8591	0.8395	0.7419	0.7419	0.7224	0.7810	0.8395	0.8786	0.9176 (22b)
Effective ac	0.9957	0.9765	0.9576	0.8690	0.8524	0.7752	0.7752	0.7609	0.8049	0.8524	0.8860	0.9210 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
Windows			13.5000	1.5038	20.3008		(27)
Heatloss Floor 1			39.3000	0.2500	9.8250		(28a)
EW	77.7000	13.5000	64.2000	0.3000	19.2600		(29a)
Flat Roof	39.5000		39.5000	0.1500	5.9250		(30)
Total net area of external elements Aum(A, m ²)			156.5000				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	55.3108		(33)
Main dwelling							
Party Wall 1			23.7000	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							170.0000 (35)
Thermal bridges (Default value 0.200 * total exposed area)							31.3000 (36)
Point Thermal bridges						(36a) =	0.0000
Total fabric heat loss						(33) + (36) + (36a) =	86.6108 (37)
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)							
(38)m	38.9381	38.1854	37.4475	33.9818	33.3334	30.3148	30.3148
Heat transfer coeff	125.5489	124.7961	124.0583	120.5925	119.9441	116.9256	116.9256
Average = Sum(39)m / 12 =							122.6273 (39)
							120.5894

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HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP (average)	3.1785	3.1594	3.1407	3.0530	3.0366	2.9601	2.9601	2.9460	2.9896	3.0366	3.0698	3.1045	(40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													1.3931 (42)
Hot water usage for mixer showers													
53.5244	52.7201	51.5480	49.3053	47.6503	45.8046	44.7556	45.9188	47.1940	49.1756	51.4664	53.3194	(42a)	
Hot water usage for baths													
20.5830	20.2773	19.8469	19.0532	18.4588	17.7998	17.4439	17.8713	18.3367	19.0419	19.8520	20.5134	(42b)	
Hot water usage for other uses													
28.8968	27.8461	26.7953	25.7445	24.6937	23.6429	23.6429	24.6937	25.7445	26.7953	27.8461	28.8968	(42c)	
Average daily hot water use (litres/day)													94.7013 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	103.0043	100.8435	98.1901	94.1029	90.8028	87.2473	85.8423	88.4838	91.2752	95.0128	99.1645	102.7297	(44)
Energy content (annual)	163.1337	143.5998	150.9145	128.8222	122.2380	107.2808	103.8188	109.5614	112.5514	128.9315	141.2780	160.8498	(45)
Distribution loss (46)m = 0.15 x (45)m										Total = Sum(45)m =		1572.9798	
24.4700	21.5400	22.6372	19.3233	18.3357	16.0921	15.5728	16.4342	16.8827	19.3397	21.1917	24.1275	(46)	
Water storage loss (or HIU loss):													
Store volume													110.0000 (47)
a) If manufacturer declared loss factor is known (kWh/day):													0.8900 (48)
Temperature factor from Table 2b													0.5400 (49)
Enter (49) or (54) in (55)													0.4806 (55)
Total storage loss													
14.8986	13.4568	14.8986	14.4180	14.8986	14.4180	14.8986	14.8986	14.4180	14.8986	14.4180	14.8986	(56)	
If cylinder contains dedicated solar storage													
14.8986	13.4568	14.8986	14.4180	14.8986	14.4180	14.8986	14.8986	14.4180	14.8986	14.4180	14.8986	(57)	
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624	(59)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(61)
Total heat required for water heating calculated for each month													
201.2947	178.0678	189.0755	165.7522	160.3990	144.2108	141.9798	147.7224	149.4814	167.0925	178.2080	199.0108	(62)	
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63d)
Output from w/h													
201.2947	178.0678	189.0755	165.7522	160.3990	144.2108	141.9798	147.7224	149.4814	167.0925	178.2080	199.0108	(64)	
12Total per year (kWh/year)													
Electric shower(s)													2022.2948 (64)
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000	(64a)
Heat gains from water heating, kWh/month													
84.7707	75.3213	80.7079	72.3774	71.1729	65.2149	65.0486	66.9580	66.9673	73.3985	76.5189	84.0114	(65)	

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5												
	60.6664	67.1664	60.6664	62.6886	60.6664	62.6886	60.6664	60.6664	62.6886	60.6664	62.6886	60.6664 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5												
	120.2780	121.5261	118.3809	111.6852	103.2330	95.2891	89.9821	88.7340	91.8792	98.5750	107.0272	114.9710 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5												
	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656 (69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)												
	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244 (71)
Water heating gains (Table 5)												
	113.9392	112.0853	108.4783	100.5241	95.6626	90.5762	87.4309	89.9973	93.0102	98.6539	106.2763	112.9185 (72)
Total internal gains												
	341.7803	347.6745	334.4223	321.7946	306.4586	292.4506	281.9761	283.2944	291.4747	304.7920	322.8887	335.4526 (73)

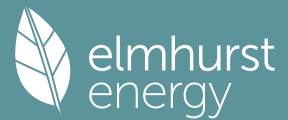
6. Solar gains

[Jan]				Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b		FF Specific data or Table 6c		Access factor Table 6d		Gains W
North				2.3000	10.6334	0.6300		0.7000		0.7700		7.4743 (74)
East				10.0000	19.6403	0.6300		0.7000		0.7700		60.0232 (76)
South				1.2000	46.7521	0.6300		0.7000		0.7700		17.1456 (78)
Solar gains	84.6432	159.7821	253.4117	361.4333	440.2717	450.5741	428.9440	369.4551	291.4459	186.6166	104.3858	70.4065 (83)
Total gains	426.4234	507.4565	587.8340	683.2280	746.7304	743.0247	710.9201	652.7495	582.9206	491.4085	427.2746	405.8591 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	14.8570	14.9466	15.0355	15.4676	15.5512	15.9527	15.9527	16.0293	15.7956	15.5512	15.3830	15.2110
alpha	1.9905	1.9964	2.0024	2.0312	2.0367	2.0635	2.0635	2.0686	2.0530	2.0367	2.0255	2.0141
util living area	0.9663	0.9513	0.9257	0.8735	0.7928	0.6760	0.5605	0.6054	0.7765	0.9034	0.9529	0.9693 (86)
MIT	17.7786	18.0582	18.5481	19.2456	19.8739	20.3875	20.6333	20.5875	20.1707	19.3515	18.4781	17.7746 (87)
Th 2	18.6634	18.6724	18.6813	18.7237	18.7318	18.7701	18.7701	18.7772	18.7552	18.7318	18.7155	18.6987 (88)
util rest of house	0.9561	0.9367	0.9020	0.8294	0.7106	0.5257	0.3283	0.3793	0.6526	0.8597	0.9361	0.9601 (89)

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MIT 2	15.2443	15.5951	16.2053	17.0709	17.7993	18.3488	18.5333	18.5197	18.1611	17.2294	16.1456	15.2533 (90)
Living area fraction									FLA = Living area / (4) =			0.7291 (91)
MIT	17.0921	17.3910	17.9134	18.6565	19.3120	19.8352	20.0645	20.0273	19.6263	18.7766	17.8462	17.0916 (92)
Temperature adjustment												0.0000
adjusted MIT	17.0921	17.3910	17.9134	18.6565	19.3120	19.8352	20.0645	20.0273	19.6263	18.7766	17.8462	17.0916 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9465	0.9257	0.8917	0.8278	0.7353	0.6065	0.4763	0.5209	0.7096	0.8608	0.9273	0.9511	(94)
Useful gains	403.6305	469.7338	524.1560	565.6010	549.1034	450.6544	338.6283	340.0336	413.6332	423.0072	396.1995	386.0235	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	1606.0366	1558.8263	1415.9316	1176.5636	913.0102	612.1346	405.0869	422.0995	652.5951	980.7387	1303.0443	1580.8669	(97)
Space heating kWh	894.5901	731.8702	663.4810	439.8931	270.7466	0.0000	0.0000	0.0000	0.0000	414.9523	652.9283	888.9635	(98a)
Space heating requirement - total per year (kWh/year)												4957.4251	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	894.5901	731.8702	663.4810	439.8931	270.7466	0.0000	0.0000	0.0000	0.0000	414.9523	652.9283	888.9635	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												4957.4251	
Space heating per m2										(98c) / (4) =		125.5044	(99)

9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													170.0000 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	894.5901	731.8702	663.4810	439.8931	270.7466	0.0000	0.0000	0.0000	0.0000	414.9523	652.9283	888.9635	(98)
Space heating efficiency (main heating system 1)	170.0000	170.0000	170.0000	170.0000	170.0000	0.0000	0.0000	0.0000	0.0000	170.0000	170.0000	170.0000	(210)
Space heating fuel (main heating system)	526.2295	430.5119	390.2830	258.7606	159.2627	0.0000	0.0000	0.0000	0.0000	244.0896	384.0755	522.9197	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	201.2947	178.0678	189.0755	165.7522	160.3990	144.2108	141.9798	147.7224	149.4814	167.0925	178.2080	199.0108	(64)
Efficiency of water heater													170.0000 (216)
(217)m	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	(217)
Fuel for water heating, kWh/month	118.4086	104.7457	111.2209	97.5013	94.3524	84.8299	83.5175	86.8955	87.9302	98.2897	104.8282	117.0652	(219)
Space cooling fuel requirement													
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(231)
Lighting	12.1186	9.7220	8.7536	6.4133	4.9538	4.0473	4.5190	5.8740	7.6297	10.0106	11.3069	12.4554	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1													2916.1324 (211)
Space heating fuel - main system 2													0.0000 (213)
Space heating fuel - secondary													0.0000 (215)
Efficiency of water heater													170.0000
Water heating fuel used													1189.5852 (219)
Space cooling fuel													0.0000 (221)
Electricity for pumps and fans:													
Total electricity for the above, kWh/year													0.0000 (231)
Electricity for lighting (calculated in Appendix L)													97.8042 (232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation													0.0000 (233)
Wind generation													0.0000 (234)
Hydro-electric generation (Appendix N)													0.0000 (235a)
Electricity generated - Micro CHP (Appendix N)													0.0000 (235)
Appendix Q - special features													
Energy saved or generated													-0.0000 (236)
Energy used													0.0000 (237)
Total delivered energy for all uses													4203.5218 (238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	2916.1324	0.1539	448.8235	(261)
Total CO2 associated with community systems			0.0000	(373)

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Water heating (other fuel)	1189.5852	0.1409	167.6618 (264)
Space and water heating			616.4854 (265)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (267)
Energy for lighting	97.8042	0.1443	14.1162 (268)
Total CO ₂ , kg/year			630.6015 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			15.9600 (273)

----- 13a. Primary energy - Individual heating systems including micro-CHP -----

	Energy kWh/year	Primary energy factor kg CO ₂ /kWh	Primary energy kWh/year
Space heating - main system 1	2916.1324	1.5698	4577.7796 (275)
Total CO ₂ associated with community systems			0.0000 (473)
Water heating (other fuel)	1189.5852	1.5212	1809.5404 (278)
Space and water heating			6387.3200 (279)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (281)
Energy for lighting	97.8042	1.5338	150.0154 (282)
Total Primary energy kWh/year			6537.3354 (286)
Dwelling Primary energy Rate (DPER)			165.5000 (287)

Energy Report



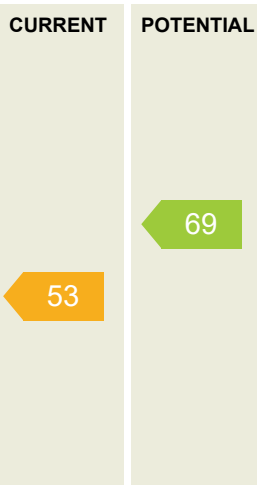
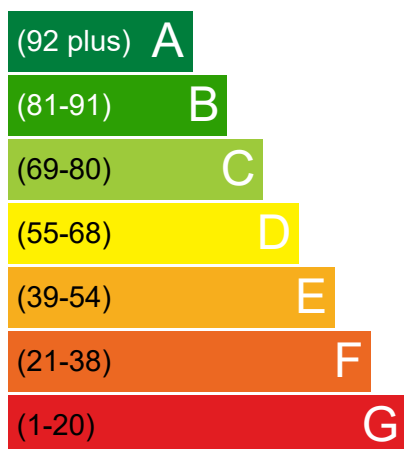
Dwelling Address	
Reference	88 St Pauls - conversion - R2-88 St Pauls - BS
SAP Version	10.2
Assessment Date	12/11/2025
Submission Date	
Property Type	Bungalow, Semi-Detached
Total Floor Area	40

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

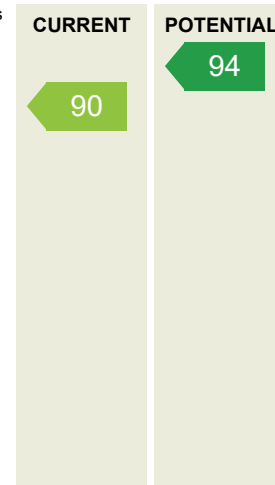
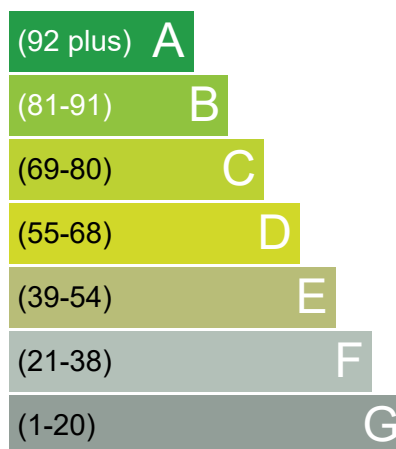
Energy Efficiency Rating

Most energy efficient - lower running costs



Carbon Dioxide (CO2) Emissions Rating

Very environmentally friendly - lower CO2 emissions



Additional ratings for your home

Energy Report

	Primary Energy	Energy	Carbon	Cost	HTC
CURRENT	145.92 kWh	3708 kWh	556 kg	1025.98 £	121 W/K
POTENTIAL	92.57 kWh	1564 kWh	283 kg	660.14 £	121 W/K

Breakdown of property's energy performance

Each feature is assessed as one of the following:

Very Poor	Poor	Average	Good	Very Good
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Feature	Description	Energy Performance
Walls	Average thermal transmittance 0.3 W/m²K	Good
Roof	Average thermal transmittance 0.15 W/m²K	Very Good
Floor	Average thermal transmittance 0.25 W/m²K	Good
Windows	High performance glazing	Good
Main heating	Air source heat pump, underfloor, electric	Poor
Main heating controls	Time and temperature zone control	Very Good
Secondary heating	None	
Hot water	From main system	Average
Lighting	Good lighting efficiency	Good
Air tightness	(not tested)	

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	£89	D 56	£4,000 - £7,000	£89	B 91
Photovoltaic	£366	C 69	£8,000 - £10,000	£277	A 94

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 	£27	£27	
Heating 	£670	£693	
Hot Water 	£329	£217	
New Technologies e.g. Impact of PV	£0	-(£277)	
TOTAL	£1026	£660	

Estimated energy use and potential savings



Space Heating

2421

kWh per year



Water Heating

1190

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.

Summary for Input Data



Plot Reference	88 St Pauls - conversion - R2		Issued on Date	02/06/2026
Assessment Reference	88 St Pauls - BL	Plot Type Ref		
Plot Address			SAP Version	10.2

SAP Rating	63 D	DER	12.43	TER	
Environmental	92 A	% DER < TER			N/A
CO ₂ Emissions (t/year)	0.44	DFEE	97.19	TFEE	
Compliance Check	N/A	% DFEE < TFEE			
% DPER < TPER		DPER	129.40	TPER	

Assessor Details	Mr. Samuel Westover	Assessor ID	AX13-0001
Client			

SUMMARY FOR INPUT DATA FOR: Conversion (As Designed)

Orientation	South	
Property Tenture	ND	
Transaction Type	6	
Terrain Type	Urban	
1.0 Property Type	Bungalow, Semi-Detached	
2.0 Number of Storeys	1	
3.0 Date Built	2024	
4.0 Sheltered Sides	2	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Enter TMP value	
Thermal Mass	170.00	kJ/m²K

7.0 Electricity Tariff	Standard
Smart electricity meter fitted	Yes
Smart gas meter fitted	Yes

7.0 Measurements				
	Ground floor:	Heat Loss Perimeter 25.90 m	Internal Floor Area 39.50 m²	Average Storey Height 3.00 m

8.0 Living Area	28.80	m²
-----------------	-------	----

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Res	Shelter	Openings	Area Calculation Type
EW	Cavity Wall	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.20		77.70	64.20	0.00	None	13.50	Calculate Wall Area

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)	Shelter Res	Shelter
Party Wall 1	Filled Cavity with Edge Sealing	Plasterboard on dabs mounted on cement render on both sides, AAC blocks, cavity	0.00		23.70	0.00	None

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Wall 1	Plasterboard on timber frame		139.20

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Code	Shelter Factor	Calculation Type	Openings
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.12	9.00	39.50	39.50	None	0.00	Calculate Wall Area	0.00

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Heatloss Floor 1	Ground Floor - Solid	Lowest occupied	Suspended concrete floor, carpeted	0.15	None	0.00	75.00	39.30

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
-------------	-------------	------	---------	-------------	--------------	---------	------------	--------------	--------------------

Summary for Input Data

Windows	Manufacturer	Window	Double Low-E Soft 0.05	0.63	0.70	1.20
---------	--------------	--------	------------------------	------	------	------

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
S	Windows	EW	South	1.20	
N	Windows	EW	North	2.30	
E	Windows	EW	East	10.00	

14.0 Conservatory

None

15.0 Draught Proofing

100

 %

16.0 Draught Lobby

No

17.0 Thermal Bridging

Default

17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E5 Ground floor (normal)		44.60			Yes
E6 Intermediate floor within a dwelling		15.90			Yes
E16 Corner (normal)		33.00			No
E18 Party wall between dwellings		6.00			No
E1 Steel lintel with perforated steel base plate		16.60			No
E3 Sill		5.80			No
E4 Jamb		40.00			No
E14 Flat roof		36.60			No

Y-value

0.20

 W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

No

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys

0

Number of open flues

0

Number of chimneys/flues attached to closed fire

0

Number of flues attached to solid fuel boiler

0

Number of flues attached to other heater

0

Number of blocked chimneys

0

Number of intermittent extract fans

2

Number of passive vents

0

Number of flueless gas fires

0

21.0 Fixed Cooling System

No

22.0 Pressure Testing

Yes

Designed AP₅₀

8.00

 m³/(h.m²) @ 50 Pa

Property Tested?

Yes

Test Method

Blower Door

22.0 Lighting

No Fixed Lighting

No

Name	Efficacy	Power	Capacity	Count
Lighting 1	100.00	5.00	500.00	20

24.0 Main Heating 1

SAP table

Percentage of Heat

100.00

 %

Fuel Type

Electricity

SAP Code

214

In Winter

170.00

In Summer

170.00

Controls SAP Code

2207

Controls description

Time and temperature zone control by arrangement

Is MHS Pumped

Pump in heated space

Heating Pump Age

2013 or later

Summary for Input Data

Heat Emitter	Radiators
Flow Temperature	Enter value
Flow Temperature Value	35.00

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
Cold Water Source	From mains
Bath Count	1
Supplementary Immersion	No
Immersion Only Heating Hot Water	No

28.1 Showers

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
S1	Vented hot water system + pump	9.00		Yes	Instantaneous System 1
S2	Vented hot water system + pump	9.00		Yes	Instantaneous System 1

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	110.00
Loss	0.89
Pipes insulation	Fully insulated primary pipework

L
kWh/day

31.0 Thermal Store

34.0 Small-scale Hydro

None												
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	

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	£89	D 66	A 93
Photovoltaic	£8,000 - £10,000	£271	C 79	A 96
Wind turbine			0	0

Full SAP Calculation Printout



Plot Reference	88 St Pauls - conversion - R2			Issued on Date	02/06/2026
Assessment Reference	88 St Pauls - BL	Plot Type Ref			
Plot Address				SAP Version	10.2
SAP Rating	63 D	DER	12.43	TER	
Environmental	92 A	% DER < TER			N/A
CO ₂ Emissions (t/year)	0.44	DFEE	97.19	TFEE	
Compliance Check	N/A	% DFEE < TFEE			
% DPER < TPER		DPER	129.40	TPER	
Assessor Details	Mr. Samuel Westover			Assessor ID	AX13-0001
Client					

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	39.5000 (1b)	3.0000 (2b)	118.5000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.5000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	118.5000 (5)

2. Ventilation rate

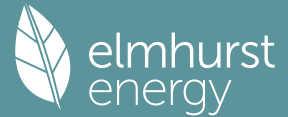
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c)	20.0000 / (5) = 0.1688 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	8.0000 (17)
Infiltration rate	0.5688 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.4835 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.6164	0.6043	0.5922	0.5318	0.5197	0.4593	0.4593	0.4472	0.4835	0.5197	0.5439	0.5681 (22b)
Effective ac	0.6900	0.6826	0.6754	0.6414	0.6351	0.6055	0.6055	0.6000	0.6169	0.6351	0.6479	0.6613 (25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K					
Main dwelling												
Windows			13.5000	1.1450	15.4580		(27)					
Heatloss Floor 1			39.3000	0.1500	5.8950		(28a)					
EW	77.7000	13.5000	64.2000	0.2000	12.8400		(29a)					
Flat Roof	39.5000		39.5000	0.1200	4.7400		(30)					
Total net area of external elements Aum(A, m2)			156.5000				(31)					
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	38.9330		(33)					
Main dwelling												
Party Wall 1			23.7000	0.0000	0.0000		(32)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							170.0000 (35)					
Thermal bridges (Default value 0.200 * total exposed area)							31.3000 (36)					
Point Thermal bridges						(36a) =	0.0000					
Total fabric heat loss						(33) + (36) + (36a) =	70.2330 (37)					
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat transfer coeff	26.9817	26.6932	26.4105	25.0823	24.8338	23.6770	23.6770	23.4628	24.1226	24.8338	25.3365	25.8621 (38)
Average = Sum(39)m / 12 =	97.2147	96.9263	96.6435	95.3153	95.0668	93.9100	93.9100	93.6958	94.3556	95.0668	95.5695	96.0951 (39)
												95.3141

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HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP (average)	2.4611	2.4538	2.4467	2.4130	2.4068	2.3775	2.3775	2.3720	2.3887	2.4068	2.4195	2.4328	(40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	2.4130	
												31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													1.3931 (42)
Hot water usage for mixer showers													
53.5244	52.7201	51.5480	49.3053	47.6503	45.8046	44.7556	45.9188	47.1940	49.1756	51.4664	53.3194	(42a)	
Hot water usage for baths													
20.5830	20.2773	19.8469	19.0532	18.4588	17.7998	17.4439	17.8713	18.3367	19.0419	19.8520	20.5134	(42b)	
Hot water usage for other uses													
28.8968	27.8461	26.7953	25.7445	24.6937	23.6429	23.6429	24.6937	25.7445	26.7953	27.8461	28.8968	(42c)	
Average daily hot water use (litres/day)												94.7013	(43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	103.0043	100.8435	98.1901	94.1029	90.8028	87.2473	85.8423	88.4838	91.2752	95.0128	99.1645	102.7297	(44)
Energy content (annual)	163.1337	143.5998	150.9145	128.8222	122.2380	107.2808	103.8188	109.5614	112.5514	128.9315	141.2780	160.8498	(45)
Distribution loss (46)m = 0.15 x (45)m										Total = Sum(45)m =		1572.9798	
24.4700	21.5400	22.6372	19.3233	18.3357	16.0921	15.5728	16.4342	16.8827	19.3397	21.1917	24.1275	(46)	
Water storage loss (or HIU loss):													
Store volume												110.0000	(47)
a) If manufacturer declared loss factor is known (kWh/day):												0.8900	(48)
Temperature factor from Table 2b												0.5400	(49)
Enter (49) or (54) in (55)												0.4806	(55)
Total storage loss													
14.8986	13.4568	14.8986	14.4180	14.8986	14.4180	14.8986	14.8986	14.4180	14.8986	14.4180	14.8986	(56)	
If cylinder contains dedicated solar storage													
14.8986	13.4568	14.8986	14.4180	14.8986	14.4180	14.8986	14.8986	14.4180	14.8986	14.4180	14.8986	(57)	
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624	(59)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(61)
Total heat required for water heating calculated for each month													
201.2947	178.0678	189.0755	165.7522	160.3990	144.2108	141.9798	147.7224	149.4814	167.0925	178.2080	199.0108	(62)	
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63d)
Output from w/h													
201.2947	178.0678	189.0755	165.7522	160.3990	144.2108	141.9798	147.7224	149.4814	167.0925	178.2080	199.0108	(64)	
12Total per year (kWh/year)												2022.2948	(64)
Electric shower(s)												2022	(64)
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(64a)	
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000	(64a)
Heat gains from water heating, kWh/month													
84.7707	75.3213	80.7079	72.3774	71.1729	65.2149	65.0486	66.9580	66.9673	73.3985	76.5189	84.0114	(65)	

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5												
	60.6664	67.1664	60.6664	62.6886	60.6664	62.6886	60.6664	60.6664	62.6886	60.6664	62.6886	60.6664 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5												
	120.2780	121.5261	118.3809	111.6852	103.2330	95.2891	89.9821	88.7340	91.8792	98.5750	107.0272	114.9710 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5												
	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656 (69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)												
	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244 (71)
Water heating gains (Table 5)												
	113.9392	112.0853	108.4783	100.5241	95.6626	90.5762	87.4309	89.9973	93.0102	98.6539	106.2763	112.9185 (72)
Total internal gains												
	341.7803	347.6745	334.4223	321.7946	306.4586	292.4506	281.9761	283.2944	291.4747	304.7920	322.8887	335.4526 (73)

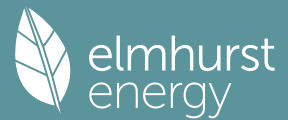
6. Solar gains

[Jan]				Area m2	Solar flux Table 6a W/m2		g Specific data or Table 6b		FF Specific data or Table 6c		Access factor Table 6d		Gains W
North				2.3000	10.6334		0.6300		0.7000		0.7700		7.4743 (74)
East				10.0000	19.6403		0.6300		0.7000		0.7700		60.0232 (76)
South				1.2000	46.7521		0.6300		0.7000		0.7700		17.1456 (78)
Solar gains	84.6432	159.7821	253.4117	361.4333	440.2717	450.5741	428.9440	369.4551	291.4459	186.6166	104.3858		70.4065 (83)
Total gains	426.4234	507.4565	587.8340	683.2280	746.7304	743.0247	710.9201	652.7495	582.9206	491.4085	427.2746		405.8591 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	19.1872	19.2443	19.3006	19.5696	19.6207	19.8624	19.8624	19.9078	19.7686	19.6207	19.5175	19.4108
alpha	2.2791	2.2830	2.2867	2.3046	2.3080	2.3242	2.3242	2.3272	2.3179	2.3080	2.3012	2.2941
util living area	0.9645	0.9467	0.9155	0.8518	0.7542	0.6222	0.4987	0.5463	0.7362	0.8888	0.9489	0.9681 (86)
MIT	17.6630	18.0227	18.6175	19.4130	20.1074	20.6122	20.8359	20.7917	20.3808	19.4652	18.4395	17.6198 (87)
Th 2	19.0436	19.0479	19.0522	19.0722	19.0760	19.0936	19.0936	19.0968	19.0868	19.0760	19.0683	19.0604 (88)
util rest of house	0.9548	0.9323	0.8917	0.8077	0.6755	0.4902	0.3122	0.3599	0.6210	0.8453	0.9324	0.9594 (89)

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MIT 2	15.4199	15.8716	16.6126	17.5835	18.3737	18.8863	19.0498	19.0330	18.6981	17.6829	16.4151	15.3728 (90)
Living area fraction									FLA = Living area / (4) =			0.7291 (91)
MIT	17.0554	17.4400	18.0744	18.9174	19.6378	20.1447	20.3521	20.3153	19.9250	18.9824	17.8911	17.0111 (92)
Temperature adjustment												0.0000
adjusted MIT	17.0554	17.4400	18.0744	18.9174	19.6378	20.1447	20.3521	20.3153	19.9250	18.9824	17.8911	17.0111 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9406	0.9159	0.8761	0.8034	0.7014	0.5684	0.4415	0.4865	0.6778	0.8426	0.9185	0.9460	(94)
Useful gains	401.0982	464.7896	514.9906	548.9336	523.7312	422.3557	313.8501	317.5730	395.1081	414.0578	392.4307	383.9561	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	1240.0146	1215.4544	1118.5883	954.8160	754.6223	520.7033	352.3568	366.8447	549.6222	796.8909	1031.3027	1231.0851	(97)
Space heating kWh	624.1538	504.4467	449.0767	292.2354	171.7830	0.0000	0.0000	0.0000	0.0000	284.8278	459.9878	630.2640	(98a)
Space heating requirement - total per year (kWh/year)												3416.7752	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	624.1538	504.4467	449.0767	292.2354	171.7830	0.0000	0.0000	0.0000	0.0000	284.8278	459.9878	630.2640	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												3416.7752	
Space heating per m2										(98c) / (4) =		86.5006	(99)

9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													170.0000 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	624.1538	504.4467	449.0767	292.2354	171.7830	0.0000	0.0000	0.0000	0.0000	284.8278	459.9878	630.2640	(98)
Space heating efficiency (main heating system 1)	170.0000	170.0000	170.0000	170.0000	170.0000	0.0000	0.0000	0.0000	0.0000	170.0000	170.0000	170.0000	(210)
Space heating fuel (main heating system)	367.1493	296.7334	264.1628	171.9032	101.0488	0.0000	0.0000	0.0000	0.0000	167.5458	270.5811	370.7435	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	201.2947	178.0678	189.0755	165.7522	160.3990	144.2108	141.9798	147.7224	149.4814	167.0925	178.2080	199.0108	(64)
Efficiency of water heater	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	(216)
(217)m	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	(217)
Fuel for water heating, kWh/month	118.4086	104.7457	111.2209	97.5013	94.3524	84.8299	83.5175	86.8955	87.9302	98.2897	104.8282	117.0652	(219)
Space cooling fuel requirement	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(231)
Lighting	11.7293	9.4097	8.4724	6.2072	4.7946	3.9173	4.3738	5.6853	7.3846	9.6890	10.9437	12.0553	(232)
Electricity generated by PVs (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
(233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
(233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1													2009.8678 (211)
Space heating fuel - main system 2													0.0000 (213)
Space heating fuel - secondary													0.0000 (215)
Efficiency of water heater													170.0000
Water heating fuel used													1189.5852 (219)
Space cooling fuel													0.0000 (221)
Electricity for pumps and fans:													
Total electricity for the above, kWh/year													0.0000 (231)
Electricity for lighting (calculated in Appendix L)													94.6621 (232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation													0.0000 (233)
Wind generation													0.0000 (234)
Hydro-electric generation (Appendix N)													0.0000 (235a)
Electricity generated - Micro CHP (Appendix N)													0.0000 (235)
Appendix Q - special features													
Energy saved or generated													-0.0000 (236)
Energy used													0.0000 (237)
Total delivered energy for all uses													3294.1151 (238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	2009.8678	0.1541	309.7353 (261)	
Total CO2 associated with community systems			0.0000 (373)	

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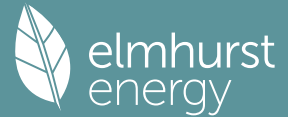


Water heating (other fuel)	1189.5852	0.1409	167.6618 (264)
Space and water heating			477.3972 (265)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (267)
Energy for lighting	94.6621	0.1443	13.6627 (268)
Total CO ₂ , kg/year			491.0598 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			12.4300 (273)

----- 13a. Primary energy - Individual heating systems including micro-CHP -----

	Energy kWh/year	Primary energy factor kg CO ₂ /kWh	Primary energy kWh/year
Space heating - main system 1	2009.8678	1.5705	3156.5749 (275)
Total CO ₂ associated with community systems			0.0000 (473)
Water heating (other fuel)	1189.5852	1.5212	1809.5404 (278)
Space and water heating			4966.1152 (279)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (281)
Energy for lighting	94.6621	1.5338	145.1959 (282)
Total Primary energy kWh/year			5111.3111 (286)
Dwelling Primary energy Rate (DPER)			129.4000 (287)

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Plot Reference	88 St Pauls - conversion - R2				Issued on Date	02/06/2026	
Assessment Reference	88 St Pauls - BL			Plot Type Ref			
Plot Address					SAP Version	10.2	
SAP Rating	63 D		DER	12.43		TER	
Environmental	92 A		% DER < TER				N/A
CO ₂ Emissions (t/year)	0.44		DFEE	97.19		TFEE	
Compliance Check	N/A		% DFEE < TFEE				
% DPER < TPER			DPER	129.40		TPER	
Assessor Details	Mr. Samuel Westover				Assessor ID	AX13-0001	
Client							

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF FABRIC ENERGY EFFICIENCY

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	39.5000 (1b)	3.0000 (2b)	118.5000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.5000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	118.5000 (5)

2. Ventilation rate

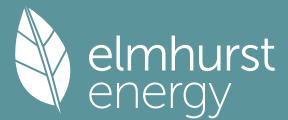
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c)	20.0000 / (5) = 0.1688 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	8.0000 (17)
Infiltration rate	0.5688 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.4835 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.6164	0.6043	0.5922	0.5318	0.5197	0.4593	0.4593	0.4472	0.4835	0.5197	0.5439	0.5681 (22b)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)												0.0000 (23b)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												0.0000 (23c)
Effective ac	0.6900	0.6826	0.6754	0.6414	0.6351	0.6055	0.6055	0.6000	0.6169	0.6351	0.6479	0.6613 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
Windows			13.5000	1.1450	15.4580		(27)
Heatloss Floor 1			39.3000	0.1500	5.8950		(28a)
EW	77.7000	13.5000	64.2000	0.2000	12.8400		(29a)
Flat Roof	39.5000		39.5000	0.1200	4.7400		(30)
Total net area of external elements Aum(A, m ²)			156.5000				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	38.9330		(33)
Main dwelling							
Party Wall 1			23.7000	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							170.0000 (35)
Thermal bridges (Default value 0.200 * total exposed area)							31.3000 (36)
Point Thermal bridges						(36a) =	0.0000
Total fabric heat loss						(33) + (36) + (36a) =	70.2330 (37)
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)							
(38)m	26.9817	26.6932	26.4105	25.0823	24.8338	23.6770	23.6770
Heat transfer coeff							

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Average = Sum(39)m / 12 =	97.2147	96.9263	96.6435	95.3153	95.0668	93.9100	93.9100	93.6958	94.3556	95.0668	95.5695	96.0951 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	2.4611	2.4538	2.4467	2.4130	2.4068	2.3775	2.3775	2.3720	2.3887	2.4068	2.4195	2.4328 (40)
HLP (average)												2.4130
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

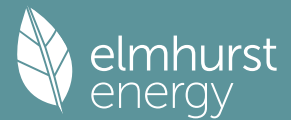
4. Water heating energy requirements (kWh/year)												
Assumed occupancy												1.3931 (42)
Hot water usage for mixer showers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42a)
Hot water usage for baths	20.5830	20.2773	19.8469	19.0532	18.4588	17.7998	17.4439	17.8713	18.3367	19.0419	19.8520	20.5134 (42b)
Hot water usage for other uses	28.8968	27.8461	26.7953	25.7445	24.6937	23.6429	23.6429	24.6937	25.7445	26.7953	27.8461	28.8968 (42c)
Average daily hot water use (litres/day)												45.3536 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	49.4799	48.1234	46.6421	44.7976	43.1525	41.4427	41.0867	42.5650	44.0812	45.8372	47.6980	49.4103 (44)
Energy content (annual)	78.3640	68.5271	71.6872	61.3257	58.0916	50.9586	49.6908	52.7043	54.3565	62.2006	67.9546	77.3646 (45)
Distribution loss (46)m = 0.15 x (45)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (46)
Water storage loss (or HIU loss):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
If cylinder contains dedicated solar storage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (61)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (62)
Total heat required for water heating calculated for each month	66.6094	58.2480	60.9341	52.1268	49.3778	43.3148	42.2372	44.7987	46.2031	52.8705	57.7614	65.7599 (63a)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64)
Output from w/h	66.6094	58.2480	60.9341	52.1268	49.3778	43.3148	42.2372	44.7987	46.2031	52.8705	57.7614	65.7599 (64)
12Total per year (kWh/year)												640.2418 (64)
Electric shower(s)	38.1015	33.9487	37.0707	35.3761	36.0399	34.3786	35.5246	36.0399	35.3761	37.0707	36.3736	38.1015 (64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												433.4021 (64a)
Heat gains from water heating, kWh/month	26.1777	23.0492	24.5012	21.8757	21.3544	19.4234	19.4404	20.2097	20.3948	22.4853	23.5338	25.9653 (65)

5. Internal gains (see Table 5 and 5a)												
Metabolic gains (Table 5), Watts												
(66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555 (66)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	60.6664	67.1664	60.6664	62.6886	60.6664	62.6886	60.6664	60.6664	62.6886	60.6664	62.6886	60.6664 (67)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	120.2780	121.5261	118.3809	111.6852	103.2330	95.2891	89.9821	88.7340	91.8792	98.5750	107.0272	114.9710 (68)
Pumps, fans	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656 (69)
Losses e.g. evaporation (negative values) (Table 5)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (70)
Water heating gains (Table 5)	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244 (71)
Total internal gains	35.1851	34.2994	32.9317	30.3830	28.7022	26.9769	26.1296	27.1635	28.3261	30.2222	32.6858	34.8996 (72)
	260.0262	266.8885	255.8757	248.6534	236.4983	228.8513	220.6749	220.4606	226.7906	233.3603	246.2982	254.4338 (73)

6. Solar gains												
[Jan]	Area	Solar flux	g	FF	Access	Gains						
	m2	Table 6a	Specific data	Specific data	factor	W						
		W/m2	or Table 6b	or Table 6c	Table 6d							
North	2.3000	10.6334	0.6300	0.7000	0.7700	7.4743 (74)						
East	10.0000	19.6403	0.6300	0.7000	0.7700	60.0232 (76)						
South	1.2000	46.7521	0.6300	0.7000	0.7700	17.1456 (78)						
Solar gains	84.6432	159.7821	253.4117	361.4333	440.2717	450.5741	428.9440	369.4551	291.4459	186.6166	104.3858	70.4065 (83)
Total gains	344.6694	426.6706	509.2874	610.0868	676.7700	679.4254	649.6189	589.9157	518.2365	419.9768	350.6841	324.8403 (84)

7. Mean internal temperature (heating season)												
Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
tau	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
alpha	19.1872	19.2443	19.3006	19.5696	19.6207	19.8624	19.8624	19.9078	19.7686	19.6207	19.5175	19.4108
util living area	2.2791	2.2830	2.2867	2.3046	2.3080	2.3242	2.3242	2.3272	2.3179	2.3080	2.3012	2.2941
	0.9768	0.9618	0.9348	0.8764	0.7844	0.6553	0.5321	0.5843	0.7736	0.9153	0.9652	0.9797 (86)
MIT	17.4576	17.8296	18.4461	19.2817	20.0176	20.5643	20.8111	20.7585	20.3020	19.3196	18.2538	17.4131 (87)
Th 2	19.0436	19.0479	19.0522	19.0722	19.0760	19.0936	19.0936	19.0968	19.0868	19.0760	19.0683	19.0604 (88)
util rest of house	0.9702	0.9510	0.9154	0.8373	0.7100	0.5232	0.3382	0.3921	0.6642	0.8796	0.9534	0.9739 (89)
MIT 2	16.0186	16.3864	16.9906	17.7981	18.4622	18.9076	19.0531	19.0371	18.7343	17.8626	16.8227	15.9841 (90)
Living area fraction												0.7291 (91)
fLA = Living area / (4) =												

Full SAP Calculation Printout



MIT	17.0678	17.4387	18.0518	18.8798	19.5963	20.1156	20.3349	20.2922	19.8774	18.9249	17.8661	17.0260 (92)
Temperature adjustment												0.0000
adjusted MIT	17.0678	17.4387	18.0518	18.8798	19.5963	20.1156	20.3349	20.2922	19.8774	18.9249	17.8661	17.0260 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9605	0.9385	0.9022	0.8326	0.7330	0.6001	0.4718	0.5216	0.7161	0.8760	0.9430	0.9650	(94)
Useful gains	331.0405	400.4488	459.4901	507.9337	496.0537	407.7134	306.5214	307.7184	371.0936	367.9117	330.6937	313.4725	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	1241.2190	1215.3248	1116.4055	951.2266	750.6719	517.9653	350.7442	364.6785	545.1265	791.4214	1028.9126	1232.5194	(97)
Space heating kWh	677.1728	547.5966	488.7450	319.1709	189.4360	0.0000	0.0000	0.0000	0.0000	315.0912	502.7176	683.7709	(98a)
Space heating requirement - total per year (kWh/year)												3723.7010	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	677.1728	547.5966	488.7450	319.1709	189.4360	0.0000	0.0000	0.0000	0.0000	315.0912	502.7176	683.7709	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												3723.7010	
Space heating per m2										(98c) / (4) =		94.2709	(99)

8c. Space cooling requirement

Calculated for June, July and August. See Table 10b												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ext. temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000
Heat loss rate W												
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	882.7541	694.9341	712.0880	0.0000	0.0000	0.0000	0.0000 (100)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.6519	0.7209	0.6787	0.0000	0.0000	0.0000	0.0000 (101)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	575.4906	500.9659	483.2729	0.0000	0.0000	0.0000	0.0000 (102)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	773.7665	740.1440	671.5023	0.0000	0.0000	0.0000	0.0000 (103)
Cooled fraction	0.0000	0.0000	0.0000	0.0000	0.0000	142.7586	177.9485	140.0427	0.0000	0.0000	0.0000	0.0000 (104)
Intermittency factor (Table 10b)	fc = cooled area / (4) =											1.0000 (105)
Space cooling kWh	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500 (106)
Space cooling requirement	0.0000	0.0000	0.0000	0.0000	0.0000	35.6897	44.4871	35.0107	0.0000	0.0000	0.0000	0.0000 (107)
Energy for space heating												115.1874 (107)
Energy for space cooling												94.2709 (99)
Total												2.9161 (108)
Fabric Energy Efficiency (DFEE)												97.1870 (109)
												97.2 (109)

Full SAP Calculation Printout



Plot Reference	88 St Pauls - conversion - R2			Issued on Date	02/06/2026
Assessment Reference	88 St Pauls - BL	Plot Type Ref			
Plot Address				SAP Version	10.2
SAP Rating	63 D	DER	12.43	TER	
Environmental	92 A	% DER < TER			N/A
CO ₂ Emissions (t/year)	0.44	DFEE	97.19	TFEE	
Compliance Check	N/A	% DFEE < TFEE			
% DPER < TPER		DPER	129.40	TPER	
Assessor Details	Mr. Samuel Westover			Assessor ID	AX13-0001
Client					

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	39.5000 (1b)	3.0000 (2b)	118.5000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.5000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	118.5000 (5)

2. Ventilation rate

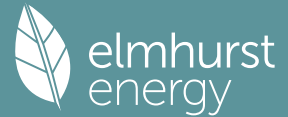
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c)	20.0000 / (5) = 0.1688 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	8.0000 (17)
Infiltration rate	0.5688 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.4835 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.6164	0.6043	0.5922	0.5318	0.5197	0.4593	0.4593	0.4472	0.4835	0.5197	0.5439	0.5681 (22b)
Effective ac	0.6900	0.6826	0.6754	0.6414	0.6351	0.6055	0.6055	0.6000	0.6169	0.6351	0.6479	0.6613 (25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K					
Main dwelling												
Windows			13.5000	1.1450	15.4580		(27)					
Heatloss Floor 1			39.3000	0.1500	5.8950		(28a)					
EW	77.7000	13.5000	64.2000	0.2000	12.8400		(29a)					
Flat Roof	39.5000		39.5000	0.1200	4.7400		(30)					
Total net area of external elements Aum(A, m2)			156.5000				(31)					
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	38.9330		(33)					
Main dwelling												
Party Wall 1			23.7000	0.0000	0.0000		(32)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							170.0000 (35)					
Thermal bridges (Default value 0.200 * total exposed area)							31.3000 (36)					
Point Thermal bridges						(36a) =	0.0000					
Total fabric heat loss						(33) + (36) + (36a) =	70.2330 (37)					
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat transfer coeff	26.9817	26.6932	26.4105	25.0823	24.8338	23.6770	23.6770	23.4628	24.1226	24.8338	25.3365	25.8621 (38)
Average = Sum(39)m / 12 =	97.2147	96.9263	96.6435	95.3153	95.0668	93.9100	93.9100	93.6958	94.3556	95.0668	95.5695	96.0951 (39)
												95.3141

Full SAP Calculation Printout



HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP (average)	2.4611	2.4538	2.4467	2.4130	2.4068	2.3775	2.3775	2.3720	2.3887	2.4068	2.4195	2.4328	(40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	2.4130	
												31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													1.3931 (42)
Hot water usage for mixer showers													
53.5244	52.7201	51.5480	49.3053	47.6503	45.8046	44.7556	45.9188	47.1940	49.1756	51.4664	53.3194	(42a)	
Hot water usage for baths													
20.5830	20.2773	19.8469	19.0532	18.4588	17.7998	17.4439	17.8713	18.3367	19.0419	19.8520	20.5134	(42b)	
Hot water usage for other uses													
28.8968	27.8461	26.7953	25.7445	24.6937	23.6429	23.6429	24.6937	25.7445	26.7953	27.8461	28.8968	(42c)	
Average daily hot water use (litres/day)												94.7013	(43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	103.0043	100.8435	98.1901	94.1029	90.8028	87.2473	85.8423	88.4838	91.2752	95.0128	99.1645	102.7297	(44)
Energy content (annual)	163.1337	143.5998	150.9145	128.8222	122.2380	107.2808	103.8188	109.5614	112.5514	128.9315	141.2780	160.8498	(45)
Distribution loss (46)m = 0.15 x (45)m										Total = Sum(45)m =		1572.9798	
24.4700	21.5400	22.6372	19.3233	18.3357	16.0921	15.5728	16.4342	16.8827	19.3397	21.1917	24.1275	(46)	
Water storage loss (or HIU loss):													
Store volume												110.0000	(47)
a) If manufacturer declared loss factor is known (kWh/day):												0.8900	(48)
Temperature factor from Table 2b												0.5400	(49)
Enter (49) or (54) in (55)												0.4806	(55)
Total storage loss													
14.8986	13.4568	14.8986	14.4180	14.8986	14.4180	14.8986	14.8986	14.4180	14.8986	14.4180	14.8986	(56)	
If cylinder contains dedicated solar storage													
14.8986	13.4568	14.8986	14.4180	14.8986	14.4180	14.8986	14.8986	14.4180	14.8986	14.4180	14.8986	(57)	
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624	(59)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(61)
Total heat required for water heating calculated for each month													
201.2947	178.0678	189.0755	165.7522	160.3990	144.2108	141.9798	147.7224	149.4814	167.0925	178.2080	199.0108	(62)	
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63d)
Output from w/h													
201.2947	178.0678	189.0755	165.7522	160.3990	144.2108	141.9798	147.7224	149.4814	167.0925	178.2080	199.0108	(64)	
												2022.2948	(64)
12Total per year (kWh/year)												2022	(64)
Electric shower(s)													
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(64a)
												0.0000	(64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =													
Heat gains from water heating, kWh/month													
84.7707	75.3213	80.7079	72.3774	71.1729	65.2149	65.0486	66.9580	66.9673	73.3985	76.5189	84.0114	(65)	

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555	69.6555 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5												
	60.6664	67.1664	60.6664	62.6886	60.6664	62.6886	60.6664	60.6664	62.6886	60.6664	62.6886	60.6664 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5												
	120.2780	121.5261	118.3809	111.6852	103.2330	95.2891	89.9821	88.7340	91.8792	98.5750	107.0272	114.9710 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5												
	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656	29.9656 (69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)												
	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244	-55.7244 (71)
Water heating gains (Table 5)												
	113.9392	112.0853	108.4783	100.5241	95.6626	90.5762	87.4309	89.9973	93.0102	98.6539	106.2763	112.9185 (72)
Total internal gains												
	341.7803	347.6745	334.4223	321.7946	306.4586	292.4506	281.9761	283.2944	291.4747	304.7920	322.8887	335.4526 (73)

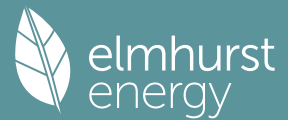
6. Solar gains

[Jan]													
				Area m2	Solar flux Table 6a W/m2		g Specific data or Table 6b		FF Specific data or Table 6c		Access factor Table 6d		Gains W
North				2.3000	10.6334		0.6300		0.7000		0.7700		7.4743 (74)
East				10.0000	19.6403		0.6300		0.7000		0.7700		60.0232 (76)
South				1.2000	46.7521		0.6300		0.7000		0.7700		17.1456 (78)
Solar gains	84.6432	159.7821	253.4117	361.4333	440.2717	450.5741	428.9440	369.4551	291.4459	186.6166	104.3858		70.4065 (83)
Total gains	426.4234	507.4565	587.8340	683.2280	746.7304	743.0247	710.9201	652.7495	582.9206	491.4085	427.2746		405.8591 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	19.1872	19.2443	19.3006	19.5696	19.6207	19.8624	19.8624	19.9078	19.7686	19.6207	19.5175	19.4108
alpha	2.2791	2.2830	2.2867	2.3046	2.3080	2.3242	2.3242	2.3272	2.3179	2.3080	2.3012	2.2941
util living area	0.9645	0.9467	0.9155	0.8518	0.7542	0.6222	0.4987	0.5463	0.7362	0.8888	0.9489	0.9681 (86)
MIT	17.6630	18.0227	18.6175	19.4130	20.1074	20.6122	20.8359	20.7917	20.3808	19.4652	18.4395	17.6198 (87)
Th 2	19.0436	19.0479	19.0522	19.0722	19.0760	19.0936	19.0936	19.0968	19.0868	19.0760	19.0683	19.0604 (88)
util rest of house	0.9548	0.9323	0.8917	0.8077	0.6755	0.4902	0.3122	0.3599	0.6210	0.8453	0.9324	0.9594 (89)

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MIT 2	15.4199	15.8716	16.6126	17.5835	18.3737	18.8863	19.0498	19.0330	18.6981	17.6829	16.4151	15.3728 (90)
Living area fraction									FLA = Living area / (4) =			0.7291 (91)
MIT	17.0554	17.4400	18.0744	18.9174	19.6378	20.1447	20.3521	20.3153	19.9250	18.9824	17.8911	17.0111 (92)
Temperature adjustment												0.0000
adjusted MIT	17.0554	17.4400	18.0744	18.9174	19.6378	20.1447	20.3521	20.3153	19.9250	18.9824	17.8911	17.0111 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9406	0.9159	0.8761	0.8034	0.7014	0.5684	0.4415	0.4865	0.6778	0.8426	0.9185	0.9460	(94)
Useful gains	401.0982	464.7896	514.9906	548.9336	523.7312	422.3557	313.8501	317.5730	395.1081	414.0578	392.4307	383.9561	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	1240.0146	1215.4544	1118.5883	954.8160	754.6223	520.7033	352.3568	366.8447	549.6222	796.8909	1031.3027	1231.0851	(97)
Space heating kWh	624.1538	504.4467	449.0767	292.2354	171.7830	0.0000	0.0000	0.0000	0.0000	284.8278	459.9878	630.2640	(98a)
Space heating requirement - total per year (kWh/year)												3416.7752	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	624.1538	504.4467	449.0767	292.2354	171.7830	0.0000	0.0000	0.0000	0.0000	284.8278	459.9878	630.2640	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												3416.7752	
Space heating per m2										(98c) / (4) =		86.5006	(99)

9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													170.0000 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	624.1538	504.4467	449.0767	292.2354	171.7830	0.0000	0.0000	0.0000	0.0000	284.8278	459.9878	630.2640	(98)
Space heating efficiency (main heating system 1)	170.0000	170.0000	170.0000	170.0000	170.0000	0.0000	0.0000	0.0000	0.0000	170.0000	170.0000	170.0000	(210)
Space heating fuel (main heating system)	367.1493	296.7334	264.1628	171.9032	101.0488	0.0000	0.0000	0.0000	0.0000	167.5458	270.5811	370.7435	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	201.2947	178.0678	189.0755	165.7522	160.3990	144.2108	141.9798	147.7224	149.4814	167.0925	178.2080	199.0108	(64)
Efficiency of water heater													170.0000 (216)
(217)m	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	170.0000	(217)
Fuel for water heating, kWh/month	118.4086	104.7457	111.2209	97.5013	94.3524	84.8299	83.5175	86.8955	87.9302	98.2897	104.8282	117.0652	(219)
Space cooling fuel requirement													
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(231)
Lighting	11.7293	9.4097	8.4724	6.2072	4.7946	3.9173	4.3738	5.6853	7.3846	9.6890	10.9437	12.0553	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1													2009.8678 (211)
Space heating fuel - main system 2													0.0000 (213)
Space heating fuel - secondary													0.0000 (215)
Efficiency of water heater													170.0000
Water heating fuel used													1189.5852 (219)
Space cooling fuel													0.0000 (221)
Electricity for pumps and fans:													
Total electricity for the above, kWh/year													0.0000 (231)
Electricity for lighting (calculated in Appendix L)													94.6621 (232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation													0.0000 (233)
Wind generation													0.0000 (234)
Hydro-electric generation (Appendix N)													0.0000 (235a)
Electricity generated - Micro CHP (Appendix N)													0.0000 (235)
Appendix Q - special features													
Energy saved or generated													-0.0000 (236)
Energy used													0.0000 (237)
Total delivered energy for all uses													3294.1151 (238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	2009.8678	0.1541	309.7353	(261)
Total CO2 associated with community systems			0.0000	(373)

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Water heating (other fuel)	1189.5852	0.1409	167.6618 (264)
Space and water heating			477.3972 (265)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (267)
Energy for lighting	94.6621	0.1443	13.6627 (268)
Total CO2, kg/year			491.0598 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			12.4300 (273)

----- 13a. Primary energy - Individual heating systems including micro-CHP -----

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Space heating - main system 1	2009.8678	1.5705	3156.5749 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	1189.5852	1.5212	1809.5404 (278)
Space and water heating			4966.1152 (279)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (281)
Energy for lighting	94.6621	1.5338	145.1959 (282)
Total Primary energy kWh/year			5111.3111 (286)
Dwelling Primary energy Rate (DPER)			129.4000 (287)

Energy Report



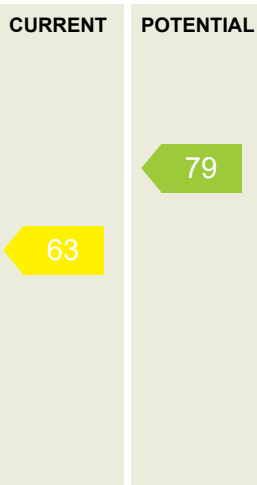
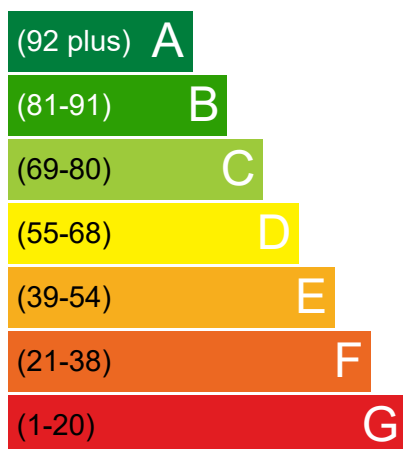
Dwelling Address	
Reference	88 St Pauls - conversion - R2-88 St Pauls - BL
SAP Version	10.2
Assessment Date	12/11/2025
Submission Date	
Property Type	Bungalow, Semi-Detached
Total Floor Area	40

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

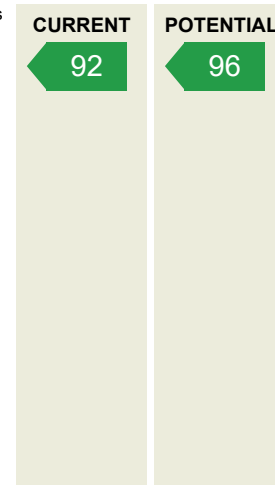
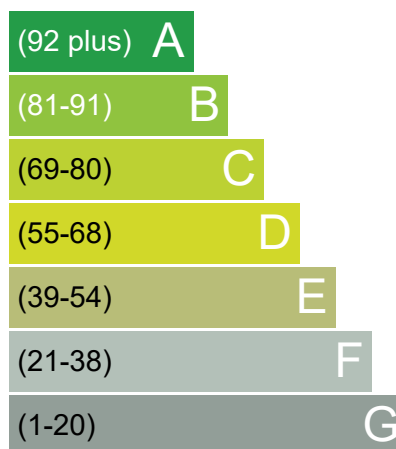
Energy Efficiency Rating

Most energy efficient - lower running costs



Carbon Dioxide (CO2) Emissions Rating

Very environmentally friendly - lower CO2 emissions



Additional ratings for your home

	Primary Energy	Energy	Carbon	Cost	HTC
CURRENT	117.01 kWh	2980 kWh	444 kg	824.62 £	95 W/K
POTENTIAL	64.28 kWh	835 kWh	171 kg	464.53 £	95 W/K

Breakdown of property's energy performance

Each feature is assessed as one of the following:

Very Poor	Poor	Average	Good	Very Good
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Feature	Description	Energy Performance
Walls	Average thermal transmittance 0.2 W/m²K	Very Good
Roof	Average thermal transmittance 0.12 W/m²K	Very Good
Floor	Average thermal transmittance 0.15 W/m²K	Very Good
Windows	High performance glazing	Very Good
Main heating	Air source heat pump, radiators, electric	Average
Main heating controls	Time and temperature zone control	Very Good
Secondary heating	None	
Hot water	From main system	Average
Lighting	Excellent lighting efficiency	Very Good
Air tightness	Air permeability [AP50] = 8.0 m³/h.m² (assumed)	Average

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	£89	D 66	£4,000 - £7,000	£89	A 93
Photovoltaic	£360	C 79	£8,000 - £10,000	£271	A 96

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 	£26	£26	
Heating 	£469	£492	
Hot Water 	£329	£217	
New Technologies e.g. Impact of PV	£0	-(£271)	
TOTAL	£825	£465	

Estimated energy use and potential savings



Space Heating

1696

kWh per year



Water Heating

1190

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.

Summary for Input Data



Plot Reference	88 St Pauls - conversion - R2		Issued on Date	02/06/2026
Assessment Reference	88 St Pauls - BG	Plot Type Ref		
Plot Address			SAP Version	10.2

SAP Rating	93 A	DER	-0.27	TER	
Environmental	100 A	% DER < TER			N/A
CO ₂ Emissions (t/year)	-0.06	DFEE	97.01	TFEE	
Compliance Check	N/A	% DFEE < TFEE			
% DPER < TPER		DPER	30.44	TPER	

Assessor Details	Mr. Samuel Westover	Assessor ID	AX13-0001
Client			

SUMMARY FOR INPUT DATA FOR: Conversion (As Designed)

Orientation	South	
Property Tenture	ND	
Transaction Type	6	
Terrain Type	Urban	
1.0 Property Type	Bungalow, Semi-Detached	
2.0 Number of Storeys	1	
3.0 Date Built	2024	
4.0 Sheltered Sides	2	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Enter TMP value	
Thermal Mass	170.00	kJ/m²K

7.0 Electricity Tariff	Standard
Smart electricity meter fitted	Yes
Smart gas meter fitted	Yes

7.0 Measurements				
	Ground floor:	Heat Loss Perimeter 25.90 m	Internal Floor Area 39.60 m²	Average Storey Height 3.00 m

8.0 Living Area	28.80	m²
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Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Res	Shelter	Openings	Area Calculation Type
EW	Cavity Wall	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.20		77.70	64.20	0.00	None	13.50	Calculate Wall Area

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)	Shelter Res	Shelter
Party Wall 1	Filled Cavity with Edge Sealing	Plasterboard on dabs mounted on cement render on both sides, AAC blocks, cavity	0.00		23.70	0.00	None

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Wall 1	Plasterboard on timber frame		139.20

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Code	Shelter Factor	Calculation Type	Openings
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.12	9.00	39.60	39.60	None	0.00	Calculate Wall Area	0.00

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Heatloss Floor 1	Ground Floor - Solid	Lowest occupied	Suspended concrete floor, carpeted	0.15	None	0.00	75.00	39.30

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
-------------	-------------	------	---------	-------------	--------------	---------	------------	--------------	--------------------

Summary for Input Data



Windows	Manufacturer	Window	Double Low-E Soft 0.05	0.63	0.70	1.20
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13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
S	Windows	EW	South	1.20	
N	Windows	EW	North	2.30	
E	Windows	EW	East	10.00	

14.0 Conservatory

None

15.0 Draught Proofing

100

 %

16.0 Draught Lobby

No

17.0 Thermal Bridging

Default

17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E5 Ground floor (normal)		44.60			Yes
E6 Intermediate floor within a dwelling		15.90			Yes
E16 Corner (normal)		33.00			No
E18 Party wall between dwellings		6.00			No
E1 Steel lintel with perforated steel base plate		16.60			No
E3 Sill		5.80			No
E4 Jamb		40.00			No
E14 Flat roof		36.60			No

Y-value

0.20

 W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

No

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys

0

Number of open flues

0

Number of chimneys/flues attached to closed fire

0

Number of flues attached to solid fuel boiler

0

Number of flues attached to other heater

0

Number of blocked chimneys

0

Number of intermittent extract fans

2

Number of passive vents

0

Number of flueless gas fires

0

21.0 Fixed Cooling System

No

22.0 Pressure Testing

Yes

Designed AP₅₀

8.00

 m³/(h.m²) @ 50 Pa

Property Tested?

Yes

Test Method

Blower Door

22.0 Lighting

No Fixed Lighting

No

Name	Efficacy	Power	Capacity	Count
Lighting 1	100.00	5.00	500.00	20

24.0 Main Heating 1

SAP table

Percentage of Heat

100.00

 %

Fuel Type

Electricity

SAP Code

214

In Winter

249.90

In Summer

175.10

Controls SAP Code

2207

Controls description

Time and temperature zone control by arrangement

Is MHS Pumped

Pump in heated space

Heating Pump Age

2013 or later

Summary for Input Data

Heat Emitter	Radiators
Flow Temperature	Enter value
Flow Temperature Value	35.00

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
Cold Water Source	From mains
Bath Count	1
Supplementary Immersion	No
Immersion Only Heating Hot Water	No

28.1 Showers	Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
S1		Vented hot water system + pump	9.00		Yes	Instantaneous System 1
S2		Vented hot water system + pump	9.00		Yes	Instantaneous System 1

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	110.00	L
Loss	0.89	kWh/day
Pipes insulation	Fully insulated primary pipework	

31.0 Thermal Store

32.0 Photovoltaic Unit	One Dwelling
Export Capable Meter?	Yes
Connected To Dwelling	Yes
Diverter	Yes
Battery Capacity [kWh]	2.00

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

34.0 Small-scale Hydro				None							
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

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	

Summary for Input Data



Solar water heating
Photovoltaic
Wind turbine

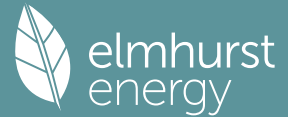
£4,000 - £7,000

£55

A 95
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Full SAP Calculation Printout



Plot Reference	88 St Pauls - conversion - R2				Issued on Date	02/06/2026	
Assessment Reference	88 St Pauls - BG			Plot Type Ref			
Plot Address					SAP Version	10.2	
SAP Rating	93 A	DER	-0.27	TER			
Environmental	100 A	% DER < TER				N/A	
CO ₂ Emissions (t/year)	-0.06	DFEE	97.01	TFEE			
Compliance Check	N/A	% DFEE < TFEE					
% DPER < TPER		DPER	30.44	TPER			
Assessor Details	Mr. Samuel Westover				Assessor ID	AX13-0001	
Client							

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	39.6000 (1b)	3.0000 (2b)	118.8000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.6000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	118.8000 (5)

2. Ventilation rate

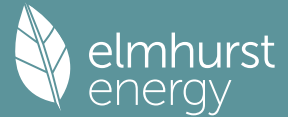
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) = 0.1684 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	8.0000 (17)
Infiltration rate	0.5684 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.4831 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.6159	0.6039	0.5918	0.5314	0.5193	0.4589	0.4589	0.4469	0.4831	0.5193	0.5435	0.5676 (22b)
Effective ac	0.6897	0.6823	0.6751	0.6412	0.6349	0.6053	0.6053	0.5998	0.6167	0.6349	0.6477	0.6611 (25)

3. Heat losses and heat loss parameter

Element	Gross		Openings	NetArea	U-value	A x U	K-value	A x K				
Main dwelling	m2		m2	m2	W/m2K	W/K	kJ/m2K	kJ/K				
Windows				13.5000	1.1450	15.4580		(27)				
Heatloss Floor 1				39.3000	0.1500	5.8950		(28a)				
EW	77.7000		13.5000	64.2000	0.2000	12.8400		(29a)				
Flat Roof	39.6000			39.6000	0.1200	4.7520		(30)				
Total net area of external elements Aum(A, m2)				156.6000				(31)				
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =		38.9450		(33)				
Main dwelling												
Party Wall 1				23.7000	0.0000	0.0000		(32)				
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K								170.0000 (35)				
Thermal bridges (Default value 0.200 * total exposed area)								31.3200 (36)				
Point Thermal bridges							(36a) =	0.0000				
Total fabric heat loss							(33) + (36) + (36a) =	70.2650 (37)				
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat transfer coeff	27.0389	26.7501	26.4670	25.1375	24.8887	23.7307	23.7307	23.5163	24.1768	24.8887	25.3920	25.9181 (38)
Average = Sum(39)m / 12 =	97.3039	97.0151	96.7320	95.4025	95.1537	93.9958	93.9958	93.7813	94.4418	95.1537	95.6570	96.1831 (39)
												95.4013

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HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	2.4572	2.4499	2.4427	2.4092	2.4029	2.3736	2.3736	2.3682	2.3849	2.4029	2.4156	2.4289 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	2.4091 31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.3957 (42)
Hot water usage for mixer showers	53.5741	52.7690	51.5958	49.3511	47.6945	45.8472	44.7971	45.9615	47.2378	49.2213	51.5142	53.3689 (42a)
Hot water usage for baths	20.6020	20.2960	19.8652	19.0707	18.4759	17.8163	17.4600	17.8878	18.3537	19.0595	19.8703	20.5324 (42b)
Hot water usage for other uses	28.9238	27.8721	26.8203	25.7685	24.7167	23.6649	23.6649	24.7167	25.7685	26.8203	27.8721	28.9238 (42c)
Average daily hot water use (litres/day)												94.7893 (43)
Daily hot water use	103.1000	100.9371	98.2813	94.1903	90.8871	87.3284	85.9220	88.5660	91.3599	95.1010	99.2566	102.8251 (44)
Energy conte	163.2852	143.7331	151.0547	128.9419	122.3515	107.3804	103.9152	109.6632	112.6559	129.0512	141.4092	160.9992 (45)
Energy content (annual)												Total = Sum(45)m = 1574.4408
Distribution loss (46)m = 0.15 x (45)m	24.4928	21.5600	22.6582	19.3413	18.3527	16.1071	15.5873	16.4495	16.8984	19.3577	21.2114	24.1499 (46)
Water storage loss (or HIU loss):												110.0000 (47)
Store volume												0.8900 (48)
a) If manufacturer declared loss factor is known (kWh/day):												0.5400 (49)
Temperature factor from Table 2b												0.4806 (55)
Enter (49) or (54) in (55)												
Total storage loss	14.8986	13.4568	14.8986	14.4180	14.8986	14.4180	14.8986	14.8986	14.4180	14.8986	14.4180	14.8986 (56)
If cylinder contains dedicated solar storage	14.8986	13.4568	14.8986	14.4180	14.8986	14.4180	14.8986	14.8986	14.4180	14.8986	14.4180	14.8986 (57)
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624 (59)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (61)
Total heat required for water heating calculated for each month	201.4462	178.2011	189.2157	165.8719	160.5125	144.3104	142.0762	147.8242	149.5859	167.2122	178.3392	199.1602 (62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
PV diverter	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000 (63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)
Output from w/h	201.4462	178.2011	189.2157	165.8719	160.5125	144.3104	142.0762	147.8242	149.5859	167.2122	178.3392	199.1602 (64)
12Total per year (kWh/year)												Total per year (kWh/year) = Sum(64)m = 2023.7558 (64)
Electric shower(s)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000 (64a)
Heat gains from water heating, kWh/month	84.8211	75.3657	80.7545	72.4172	71.2107	65.2480	65.0806	66.9918	67.0021	73.4383	76.5626	84.0610 (65)

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	60.7929	67.3064	60.7929	62.8193	60.7929	62.8193	60.7929	60.7929	62.8193	60.7929	62.8193	60.7929 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	120.5287	121.7794	118.6277	111.9180	103.4482	95.4878	90.1697	88.9190	92.0708	98.7805	107.2503	115.2107 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787 (69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298 (71)
Water heating gains (Table 5)	114.0069	112.1513	108.5410	100.5794	95.7133	90.6222	87.4740	90.0428	93.0585	98.7074	106.3369	112.9853 (72)
Total internal gains	342.2647	348.1733	334.8977	322.2529	306.8906	292.8655	282.3728	283.6909	291.8848	305.2170	323.3427	335.9250 (73)

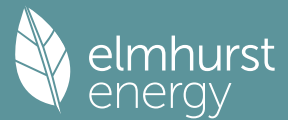
6. Solar gains

[Jan]				Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W			
North				2.3000	10.6334	0.6300	0.7000	0.7700	7.4743 (74)			
East				10.0000	19.6403	0.6300	0.7000	0.7700	60.0232 (76)			
South				1.2000	46.7521	0.6300	0.7000	0.7700	17.1456 (78)			
Solar gains	84.6432	159.7821	253.4117	361.4333	440.2717	450.5741	428.9440	369.4551	291.4459	186.6166	104.3858	70.4065 (83)
Total gains	426.9079	507.9554	588.3094	683.6862	747.1623	743.4396	711.3168	653.1459	583.3306	491.8336	427.7285	406.3316 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	19.2181	19.2753	19.3318	19.6012	19.6524	19.8945	19.8945	19.9400	19.8006	19.6524	19.5490	19.4421
alpha	2.2812	2.2850	2.2888	2.3067	2.3102	2.3263	2.3263	2.3293	2.3200	2.3102	2.3033	2.2961
util living area	0.9646	0.9469	0.9157	0.8520	0.7545	0.6225	0.4989	0.5465	0.7365	0.8890	0.9490	0.9682 (86)
MIT	17.6663	18.0256	18.6197	19.4145	20.1084	20.6127	20.8362	20.7920	20.3816	19.4668	18.4421	17.6231 (87)
Th 2	19.0460	19.0503	19.0545	19.0745	19.0783	19.0959	19.0959	19.0959	19.0891	19.0783	19.0707	19.0628 (88)
util rest of house	0.9549	0.9325	0.8919	0.8080	0.6759	0.4906	0.3126	0.3603	0.6214	0.8455	0.9325	0.9595 (89)

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MIT 2	15.4251	15.8763	16.6165	17.5867	18.3764	18.8887	19.0521	19.0353	18.7006	17.6861	16.4194	15.3780 (90)
Living area fraction									FLA = Living area / (4) =			0.7273 (91)
MIT	17.0551	17.4394	18.0734	18.9160	19.6360	20.1426	20.3496	20.3129	19.9231	18.9812	17.8904	17.0108 (92)
Temperature adjustment												0.0000
adjusted MIT	17.0551	17.4394	18.0734	18.9160	19.6360	20.1426	20.3496	20.3129	19.9231	18.9812	17.8904	17.0108 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9407	0.9161	0.8763	0.8037	0.7016	0.5686	0.4415	0.4865	0.6780	0.8428	0.9186	0.9461	(94)
Useful gains	401.5998	465.3198	515.5203	549.4630	524.2074	422.6901	314.0149	317.7665	395.4717	414.5027	392.9027	384.4440	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	1241.1179	1216.5107	1119.5167	955.5550	755.1412	520.9765	352.4480	366.9583	549.9467	797.4982	1032.1804	1232.1856	(97)
Space heating kWh	624.6014	504.8003	449.3733	292.3862	171.8147	0.0000	0.0000	0.0000	0.0000	284.9486	460.2799	630.7198	(98a)
Space heating requirement - total per year (kWh/year)												3418.9244	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	624.6014	504.8003	449.3733	292.3862	171.8147	0.0000	0.0000	0.0000	0.0000	284.9486	460.2799	630.7198	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												3418.9244	
Space heating per m2											(98c) / (4) =	86.3365	(99)

9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													249.9000 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	624.6014	504.8003	449.3733	292.3862	171.8147	0.0000	0.0000	0.0000	0.0000	284.9486	460.2799	630.7198	(98)
Space heating efficiency (main heating system 1)	249.9000	249.9000	249.9000	249.9000	249.9000	0.0000	0.0000	0.0000	0.0000	249.9000	249.9000	249.9000	(210)
Space heating fuel (main heating system)	249.9406	202.0009	179.8213	117.0013	68.7534	0.0000	0.0000	0.0000	0.0000	114.0251	184.1857	252.3889	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	201.4462	178.2011	189.2157	165.8719	160.5125	144.3104	142.0762	147.8242	149.5859	167.2122	178.3392	199.1602	(64)
Efficiency of water heater	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	(216)
(217)m	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	(217)
Fuel for water heating, kWh/month	115.0464	101.7711	108.0615	94.7298	91.6691	82.4160	81.1401	84.4227	85.4289	95.4953	101.8499	113.7408	(219)
Space cooling fuel requirement													
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(231)
Lighting	11.7537	9.4293	8.4900	6.2202	4.8046	3.9254	4.3829	5.6971	7.4000	9.7092	10.9665	12.0804	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	-71.9100	-105.2164	-152.4338	-163.5631	-161.0836	-121.3791	-119.7102	-118.0581	-110.5968	-115.7724	-79.7736	-61.6864	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233b)m	-18.2457	-45.2275	-103.7895	-179.8266	-263.1454	-295.7056	-291.8626	-241.5350	-171.0368	-76.5502	-27.1640	-13.7586	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1													1368.1170 (211)
Space heating fuel - main system 2													0.0000 (213)
Space heating fuel - secondary													0.0000 (215)
Efficiency of water heater													175.1000
Water heating fuel used													1155.7714 (219)
Space cooling fuel													0.0000 (221)
Electricity for pumps and fans:													
Total electricity for the above, kWh/year													0.0000 (231)
Electricity for lighting (calculated in Appendix L)													94.8594 (232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation													-3109.0309 (233)
Wind generation													0.0000 (234)
Hydro-electric generation (Appendix N)													0.0000 (235a)
Electricity generated - Micro CHP (Appendix N)													0.0000 (235)
Appendix Q - special features													
Energy saved or generated													-0.0000 (236)
Energy used													0.0000 (237)
Total delivered energy for all uses													-490.2830 (238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	1368.1170	0.1541	210.8386 (261)	
Total CO2 associated with community systems			0.0000 (373)	

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Water heating (other fuel)	1155.7714	0.1409	162.8966 (264)
Space and water heating			373.7352 (265)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (267)
Energy for lighting	94.8594	0.1443	13.6911 (268)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-1381.1835	0.1368	-188.9453
PV Unit electricity exported	-1727.8474	0.1210	-209.1298
Total			-398.0751 (269)
Total CO2, kg/year			-10.6488 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			-0.2700 (273)

----- 13a. Primary energy - Individual heating systems including micro-CHP -----

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Space heating - main system 1	1368.1170	1.5705	2148.6869 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	1155.7714	1.5212	1758.1065 (278)
Space and water heating			3906.7934 (279)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (281)
Energy for lighting	94.8594	1.5338	145.4986 (282)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-1381.1835	1.5058	-2079.7321
PV Unit electricity exported	-1727.8474	0.4440	-767.1005
Total			-2846.8326 (283)
Total Primary energy kWh/year			1205.4594 (286)
Dwelling Primary energy Rate (DPER)			30.4400 (287)

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Plot Reference	88 St Pauls - conversion - R2			Issued on Date	02/06/2026
Assessment Reference	88 St Pauls - BG	Plot Type Ref			
Plot Address				SAP Version	10.2
SAP Rating	93 A	DER	-0.27	TER	
Environmental	100 A	% DER < TER			N/A
CO ₂ Emissions (t/year)	-0.06	DFEE	97.01	TFEE	
Compliance Check	N/A	% DFEE < TFEE			
% DPER < TPER		DPER	30.44	TPER	
Assessor Details	Mr. Samuel Westover			Assessor ID	AX13-0001
Client					

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF FABRIC ENERGY EFFICIENCY

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	39.6000 (1b)	3.0000 (2b)	118.8000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.6000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	118.8000 (5)

2. Ventilation rate

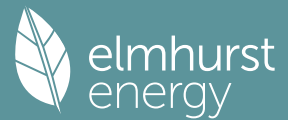
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c)	20.0000 / (5) = 0.1684 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	8.0000 (17)
Infiltration rate	0.5684 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.4831 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.6159	0.6039	0.5918	0.5314	0.5193	0.4589	0.4589	0.4469	0.4831	0.5193	0.5435	0.5676 (22b)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)												0.0000 (23b)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												0.0000 (23c)
Effective ac	0.6897	0.6823	0.6751	0.6412	0.6349	0.6053	0.6053	0.5998	0.6167	0.6349	0.6477	0.6611 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
Windows			13.5000	1.1450	15.4580		(27)
Heatloss Floor 1			39.3000	0.1500	5.8950		(28a)
EW	77.7000	13.5000	64.2000	0.2000	12.8400		(29a)
Flat Roof	39.6000		39.6000	0.1200	4.7520		(30)
Total net area of external elements Aum(A, m ²)			156.6000				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	38.9450		(33)
Main dwelling							
Party Wall 1			23.7000	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							170.0000 (35)
Thermal bridges (Default value 0.200 * total exposed area)							31.3200 (36)
Point Thermal bridges						(36a) =	0.0000
Total fabric heat loss						(33) + (36) + (36a) =	70.2650 (37)
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)							
(38)m	27.0389	26.7501	26.4670	25.1375	24.8887	23.7307	23.7307
Heat transfer coeff						Aug	23.5163
						Sep	24.1768
						Oct	24.8887
						Nov	25.3920
						Dec	25.9181 (38)

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Average = Sum(39)m / 12 =	97.3039	97.0151	96.7320	95.4025	95.1537	93.9958	93.9958	93.7813	94.4418	95.1537	95.6570	96.1831 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	2.4572	2.4499	2.4427	2.4092	2.4029	2.3736	2.3736	2.3682	2.3849	2.4029	2.4156	2.4289 (40)
HLP (average)												2.4091
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.3957 (42)
Hot water usage for mixer showers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42a)
Hot water usage for baths	20.6020	20.2960	19.8652	19.0707	18.4759	17.8163	17.4600	17.8878	18.3537	19.0595	19.8703	20.5324 (42b)
Hot water usage for other uses	28.9238	27.8721	26.8203	25.7685	24.7167	23.6649	23.6649	24.7167	25.7685	26.8203	27.8721	28.9238 (42c)
Average daily hot water use (litres/day)												45.3957 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	49.5258	48.1691	46.6855	44.8392	43.1926	41.4812	41.1249	42.6045	44.1222	45.8798	47.7423	49.4562 (44)
Energy conte	78.4368	68.5907	71.7538	61.3827	58.1455	51.0060	49.7370	52.7533	54.4070	62.2584	68.0177	77.4365 (45)
Energy content (annual)										Total = Sum(45)m =		753.9255
Distribution loss (46)m = 0.15 x (45)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (46)
Water storage loss (or HIU loss):												
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
If cylinder contains dedicated solar storage												
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)
Total heat required for water heating calculated for each month												
WWHRS	66.6713	58.3021	60.9907	52.1753	49.4237	43.3551	42.2765	44.8403	46.2460	52.9196	57.8151	65.8210 (62)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
Output from w/h	66.6713	58.3021	60.9907	52.1753	49.4237	43.3551	42.2765	44.8403	46.2460	52.9196	57.8151	65.8210 (64)
12Total per year (kWh/year)								Total per year (kWh/year) = Sum(64)m =				640.8367 (64)
Electric shower(s)	38.1369	33.9803	37.1051	35.4090	36.0734	34.4105	35.5575	36.0734	35.4090	37.1051	36.4074	38.1369 (64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												433.8045 (64a)
Heat gains from water heating, kWh/month	26.2020	23.0706	24.5240	21.8961	21.3743	19.4414	19.4585	20.2284	20.4137	22.5062	23.5556	25.9895 (65)

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts												
(66)m	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	60.7929	67.3064	60.7929	62.8193	60.7929	62.8193	60.7929	60.7929	62.8193	60.7929	62.8193	60.7929 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	120.5287	121.7794	118.6277	111.9180	103.4482	95.4878	90.1697	88.9190	92.0708	98.7805	107.2503	115.2107 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787 (69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298 (71)
Water heating gains (Table 5)	35.2178	34.3312	32.9623	30.4112	28.7289	27.0019	26.1539	27.1888	28.3524	30.2503	32.7161	34.9321 (72)
Total internal gains	260.4756	267.3533	256.3191	249.0847	236.9061	229.2452	221.0527	220.8369	227.1787	233.7598	246.7219	254.8718 (73)

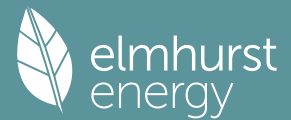
6. Solar gains

[Jan]					Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c			Access factor Table 6d	Gains W	
North					2.3000	10.6334	0.6300	0.7000			0.7700	7.4743 (74)	
East					10.0000	19.6403	0.6300	0.7000			0.7700	60.0232 (76)	
South					1.2000	46.7521	0.6300	0.7000			0.7700	17.1456 (78)	
Solar gains	84.6432	159.7821	253.4117	361.4333	440.2717	450.5741	428.9440	369.4551	291.4459	186.6166	104.3858	70.4065 (83)	
Total gains	345.1188	427.1354	509.7308	610.5180	677.1779	679.8193	649.9967	590.2919	518.6246	420.3764	351.1078	325.2784 (84)	

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
tau	19.2181	19.2753	19.3318	19.6012	19.6524	19.8945	19.8945	19.9400	19.8006	19.6524	19.5490	19.4421
alpha	2.2812	2.2850	2.2888	2.3067	2.3102	2.3263	2.3263	2.3293	2.3200	2.3102	2.3033	2.2961
util living area	0.9769	0.9619	0.9349	0.8766	0.7847	0.6556	0.5323	0.5846	0.7738	0.9154	0.9653	0.9798 (86)
MIT	17.4612	17.8327	18.4485	19.2833	20.0186	20.5649	20.8114	20.7588	20.3028	19.3213	18.2565	17.4167 (87)
Th 2	19.0460	19.0503	19.0545	19.0745	19.0783	19.0959	19.0959	19.0959	19.0891	19.0783	19.0707	19.0628 (88)
util rest of house	0.9703	0.9511	0.9156	0.8376	0.7104	0.5236	0.3386	0.3926	0.6646	0.8799	0.9535	0.9740 (89)
MIT 2	16.0234	16.3908	16.9943	17.8012	18.4648	18.9100	19.0554	19.0394	18.7368	17.8657	16.8268	15.9890 (90)
Living area fraction									fLA = Living area / (4) =			0.7273 (91)

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MIT	17.0690	17.4394	18.0519	18.8791	19.5948	20.1135	20.3325	20.2899	19.8757	18.9243	17.8666	17.0274 (92)
Temperature adjustment												0.0000
adjusted MIT	17.0690	17.4394	18.0519	18.8791	19.5948	20.1135	20.3325	20.2899	19.8757	18.9243	17.8666	17.0274 (93)

8. Space heating requirement

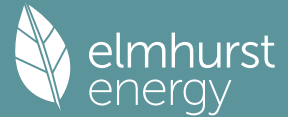
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9605	0.9387	0.9024	0.8328	0.7332	0.6002	0.4718	0.5216	0.7162	0.8762	0.9431	0.9651	(94)
Useful gains	331.5010	400.9384	459.9825	508.4378	496.5180	408.0499	306.6949	307.9207	371.4535	368.3320	331.1306	313.9199	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	1242.4762	1216.5154	1117.4369	952.0278	751.2214	518.2501	350.8406	364.7988	545.4710	792.0892	1029.9024	1233.7744	(97)
Space heating kWh	677.7656	548.0677	489.1461	319.3848	189.4993	0.0000	0.0000	0.0000	0.0000	315.2753	503.1157	684.3717	(98a)
Space heating requirement - total per year (kWh/year)												3726.6263	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	677.7656	548.0677	489.1461	319.3848	189.4993	0.0000	0.0000	0.0000	0.0000	315.2753	503.1157	684.3717	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												3726.6263	
Space heating per m2										(98c) / (4) =		94.1067	(99)

8c. Space cooling requirement

Calculated for June, July and August. See Table 10b

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Ext. temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	
Heat loss rate W	0.0000	0.0000	0.0000	0.0000	0.0000	883.5601	695.5686	712.7380	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.6520	0.7209	0.6787	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	576.0473	501.4700	483.7623	0.0000	0.0000	0.0000	0.0000	(102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	774.1703	740.5314	671.8903	0.0000	0.0000	0.0000	0.0000	(103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	142.6485	177.8617	139.9672	0.0000	0.0000	0.0000	0.0000	(104)
Cooled fraction									fc = cooled area /				(105)
Intermittency factor (Table 10b)	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	(106)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	35.6621	44.4654	34.9918	0.0000	0.0000	0.0000	0.0000	(107)
Space cooling requirement												115.1194	(107)
Energy for space heating												94.1067	(99)
Energy for space cooling												2.9071	(108)
Total												97.0138	(109)
Fabric Energy Efficiency (DFEE)												97.0	(109)

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Plot Reference	88 St Pauls - conversion - R2				Issued on Date	02/06/2026	
Assessment Reference	88 St Pauls - BG			Plot Type Ref			
Plot Address					SAP Version	10.2	
SAP Rating	93 A	DER	-0.27	TER			
Environmental	100 A	% DER < TER				N/A	
CO ₂ Emissions (t/year)	-0.06	DFEE	97.01	TFEE			
Compliance Check	N/A	% DFEE < TFEE					
% DPER < TPER		DPER	30.44	TPER			
Assessor Details	Mr. Samuel Westover				Assessor ID	AX13-0001	
Client							

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	39.6000 (1b)	3.0000 (2b)	118.8000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.6000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	118.8000 (5)

2. Ventilation rate

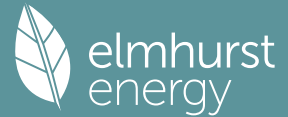
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c)	20.0000 / (5) = 0.1684 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	8.0000 (17)
Infiltration rate	0.5684 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.4831 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.6159	0.6039	0.5918	0.5314	0.5193	0.4589	0.4589	0.4469	0.4831	0.5193	0.5435	0.5676 (22b)
Effective ac	0.6897	0.6823	0.6751	0.6412	0.6349	0.6053	0.6053	0.5998	0.6167	0.6349	0.6477	0.6611 (25)

3. Heat losses and heat loss parameter

Element	Gross		Openings	NetArea	U-value	A x U	K-value	A x K				
Main dwelling	m2		m2	m2	W/m2K	W/K	kJ/m2K	kJ/K				
Windows				13.5000	1.1450	15.4580		(27)				
Heatloss Floor 1				39.3000	0.1500	5.8950		(28a)				
EW	77.7000		13.5000	64.2000	0.2000	12.8400		(29a)				
Flat Roof	39.6000			39.6000	0.1200	4.7520		(30)				
Total net area of external elements Aum(A, m2)				156.6000				(31)				
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =		38.9450		(33)				
Main dwelling												
Party Wall 1				23.7000	0.0000	0.0000		(32)				
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K								170.0000 (35)				
Thermal bridges (Default value 0.200 * total exposed area)								31.3200 (36)				
Point Thermal bridges							(36a) =	0.0000				
Total fabric heat loss							(33) + (36) + (36a) =	70.2650 (37)				
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat transfer coeff	27.0389	26.7501	26.4670	25.1375	24.8887	23.7307	23.7307	23.5163	24.1768	24.8887	25.3920	25.9181 (38)
Average = Sum(39)m / 12 =	97.3039	97.0151	96.7320	95.4025	95.1537	93.9958	93.9958	93.7813	94.4418	95.1537	95.6570	96.1831 (39)
												95.4013

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HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	2.4572	2.4499	2.4427	2.4092	2.4029	2.3736	2.3736	2.3682	2.3849	2.4029	2.4156	2.4289 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	2.4091 31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.3957 (42)
Hot water usage for mixer showers	53.5741	52.7690	51.5958	49.3511	47.6945	45.8472	44.7971	45.9615	47.2378	49.2213	51.5142	53.3689 (42a)
Hot water usage for baths	20.6020	20.2960	19.8652	19.0707	18.4759	17.8163	17.4600	17.8878	18.3537	19.0595	19.8703	20.5324 (42b)
Hot water usage for other uses	28.9238	27.8721	26.8203	25.7685	24.7167	23.6649	23.6649	24.7167	25.7685	26.8203	27.8721	28.9238 (42c)
Average daily hot water use (litres/day)												94.7893 (43)
Daily hot water use	103.1000	100.9371	98.2813	94.1903	90.8871	87.3284	85.9220	88.5660	91.3599	95.1010	99.2566	102.8251 (44)
Energy conte	163.2852	143.7331	151.0547	128.9419	122.3515	107.3804	103.9152	109.6632	112.6559	129.0512	141.4092	160.9992 (45)
Energy content (annual)												Total = Sum(45)m = 1574.4408
Distribution loss (46)m = 0.15 x (45)m	24.4928	21.5600	22.6582	19.3413	18.3527	16.1071	15.5873	16.4495	16.8984	19.3577	21.2114	24.1499 (46)
Water storage loss (or HIU loss):												110.0000 (47)
Store volume												0.8900 (48)
a) If manufacturer declared loss factor is known (kWh/day):												0.5400 (49)
Temperature factor from Table 2b												0.4806 (55)
Enter (49) or (54) in (55)												
Total storage loss	14.8986	13.4568	14.8986	14.4180	14.8986	14.4180	14.8986	14.8986	14.4180	14.8986	14.4180	14.8986 (56)
If cylinder contains dedicated solar storage	14.8986	13.4568	14.8986	14.4180	14.8986	14.4180	14.8986	14.8986	14.4180	14.8986	14.4180	14.8986 (57)
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624 (59)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (61)
Total heat required for water heating calculated for each month	201.4462	178.2011	189.2157	165.8719	160.5125	144.3104	142.0762	147.8242	149.5859	167.2122	178.3392	199.1602 (62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
PV diverter	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000 (63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)
Output from w/h	201.4462	178.2011	189.2157	165.8719	160.5125	144.3104	142.0762	147.8242	149.5859	167.2122	178.3392	199.1602 (64)
12Total per year (kWh/year)												Total per year (kWh/year) = Sum(64)m = 2023.7558 (64)
Electric shower(s)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000 (64a)
Heat gains from water heating, kWh/month	84.8211	75.3657	80.7545	72.4172	71.2107	65.2480	65.0806	66.9918	67.0021	73.4383	76.5626	84.0610 (65)

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873	69.7873 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	60.7929	67.3064	60.7929	62.8193	60.7929	62.8193	60.7929	60.7929	62.8193	60.7929	62.8193	60.7929 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	120.5287	121.7794	118.6277	111.9180	103.4482	95.4878	90.1697	88.9190	92.0708	98.7805	107.2503	115.2107 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787	29.9787 (69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298	-55.8298 (71)
Water heating gains (Table 5)	114.0069	112.1513	108.5410	100.5794	95.7133	90.6222	87.4740	90.0428	93.0585	98.7074	106.3369	112.9853 (72)
Total internal gains	342.2647	348.1733	334.8977	322.2529	306.8906	292.8655	282.3728	283.6909	291.8848	305.2170	323.3427	335.9250 (73)

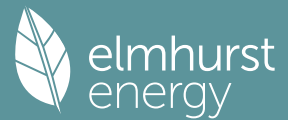
6. Solar gains

[Jan]					Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d		Gains W	
North					2.3000	10.6334	0.6300	0.7000	0.7700		7.4743 (74)	
East					10.0000	19.6403	0.6300	0.7000	0.7700		60.0232 (76)	
South					1.2000	46.7521	0.6300	0.7000	0.7700		17.1456 (78)	
Solar gains	84.6432	159.7821	253.4117	361.4333	440.2717	450.5741	428.9440	369.4551	291.4459	186.6166	104.3858	70.4065 (83)
Total gains	426.9079	507.9554	588.3094	683.6862	747.1623	743.4396	711.3168	653.1459	583.3306	491.8336	427.7285	406.3316 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	19.2181	19.2753	19.3318	19.6012	19.6524	19.8945	19.8945	19.9400	19.8006	19.6524	19.5490	19.4421
alpha	2.2812	2.2850	2.2888	2.3067	2.3102	2.3263	2.3263	2.3293	2.3200	2.3102	2.3033	2.2961
util living area	0.9646	0.9469	0.9157	0.8520	0.7545	0.6225	0.4989	0.5465	0.7365	0.8890	0.9490	0.9682 (86)
MIT	17.6663	18.0256	18.6197	19.4145	20.1084	20.6127	20.8362	20.7920	20.3816	19.4668	18.4421	17.6231 (87)
Th 2	19.0460	19.0503	19.0545	19.0745	19.0783	19.0959	19.0959	19.0959	19.0891	19.0783	19.0707	19.0628 (88)
util rest of house	0.9549	0.9325	0.8919	0.8080	0.6759	0.4906	0.3126	0.3603	0.6214	0.8455	0.9325	0.9595 (89)

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MIT 2	15.4251	15.8763	16.6165	17.5867	18.3764	18.8887	19.0521	19.0353	18.7006	17.6861	16.4194	15.3780 (90)
Living area fraction									FLA = Living area / (4) =			0.7273 (91)
MIT	17.0551	17.4394	18.0734	18.9160	19.6360	20.1426	20.3496	20.3129	19.9231	18.9812	17.8904	17.0108 (92)
Temperature adjustment												0.0000
adjusted MIT	17.0551	17.4394	18.0734	18.9160	19.6360	20.1426	20.3496	20.3129	19.9231	18.9812	17.8904	17.0108 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9407	0.9161	0.8763	0.8037	0.7016	0.5686	0.4415	0.4865	0.6780	0.8428	0.9186	0.9461	(94)
Useful gains	401.5998	465.3198	515.5203	549.4630	524.2074	422.6901	314.0149	317.7665	395.4717	414.5027	392.9027	384.4440	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	1241.1179	1216.5107	1119.5167	955.5550	755.1412	520.9765	352.4480	366.9583	549.9467	797.4982	1032.1804	1232.1856	(97)
Space heating kWh	624.6014	504.8003	449.3733	292.3862	171.8147	0.0000	0.0000	0.0000	0.0000	284.9486	460.2799	630.7198	(98a)
Space heating requirement - total per year (kWh/year)												3418.9244	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	624.6014	504.8003	449.3733	292.3862	171.8147	0.0000	0.0000	0.0000	0.0000	284.9486	460.2799	630.7198	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												3418.9244	
Space heating per m2										(98c) / (4) =		86.3365	(99)

9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													249.9000 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	624.6014	504.8003	449.3733	292.3862	171.8147	0.0000	0.0000	0.0000	0.0000	284.9486	460.2799	630.7198	(98)
Space heating efficiency (main heating system 1)	249.9000	249.9000	249.9000	249.9000	249.9000	0.0000	0.0000	0.0000	0.0000	249.9000	249.9000	249.9000	(210)
Space heating fuel (main heating system)	249.9406	202.0009	179.8213	117.0013	68.7534	0.0000	0.0000	0.0000	0.0000	114.0251	184.1857	252.3889	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	201.4462	178.2011	189.2157	165.8719	160.5125	144.3104	142.0762	147.8242	149.5859	167.2122	178.3392	199.1602	(64)
Efficiency of water heater													175.1000 (216)
(217)m	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	175.1000	(217)
Fuel for water heating, kWh/month	115.0464	101.7711	108.0615	94.7298	91.6691	82.4160	81.1401	84.4227	85.4289	95.4953	101.8499	113.7408	(219)
Space cooling fuel requirement													
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(231)
Lighting	11.7537	9.4293	8.4900	6.2202	4.8046	3.9254	4.3829	5.6971	7.4000	9.7092	10.9665	12.0804	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	-71.9100	-105.2164	-152.4338	-163.5631	-161.0836	-121.3791	-119.7102	-118.0581	-110.5968	-115.7724	-79.7736	-61.6864	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233b)m	-18.2457	-45.2275	-103.7895	-179.8266	-263.1454	-295.7056	-291.8626	-241.5350	-171.0368	-76.5502	-27.1640	-13.7586	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1													1368.1170 (211)
Space heating fuel - main system 2													0.0000 (213)
Space heating fuel - secondary													0.0000 (215)
Efficiency of water heater													175.1000
Water heating fuel used													1155.7714 (219)
Space cooling fuel													0.0000 (221)
Electricity for pumps and fans:													
Total electricity for the above, kWh/year													0.0000 (231)
Electricity for lighting (calculated in Appendix L)													94.8594 (232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation													-3109.0309 (233)
Wind generation													0.0000 (234)
Hydro-electric generation (Appendix N)													0.0000 (235a)
Electricity generated - Micro CHP (Appendix N)													0.0000 (235)
Appendix Q - special features													
Energy saved or generated													-0.0000 (236)
Energy used													0.0000 (237)
Total delivered energy for all uses													-490.2830 (238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	1368.1170	0.1541	210.8386 (261)	
Total CO2 associated with community systems			0.0000 (373)	

Full SAP Calculation Printout



Water heating (other fuel)	1155.7714	0.1409	162.8966 (264)
Space and water heating			373.7352 (265)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (267)
Energy for lighting	94.8594	0.1443	13.6911 (268)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-1381.1835	0.1368	-188.9453
PV Unit electricity exported	-1727.8474	0.1210	-209.1298
Total			-398.0751 (269)
Total CO2, kg/year			-10.6488 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			-0.2700 (273)

----- 13a. Primary energy - Individual heating systems including micro-CHP -----

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Space heating - main system 1	1368.1170	1.5705	2148.6869 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	1155.7714	1.5212	1758.1065 (278)
Space and water heating			3906.7934 (279)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (281)
Energy for lighting	94.8594	1.5338	145.4986 (282)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-1381.1835	1.5058	-2079.7321
PV Unit electricity exported	-1727.8474	0.4440	-767.1005
Total			-2846.8326 (283)
Total Primary energy kWh/year			1205.4594 (286)
Dwelling Primary energy Rate (DPER)			30.4400 (287)

Energy Report



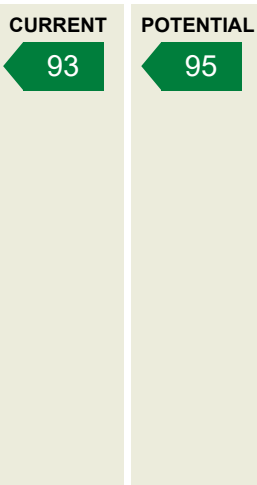
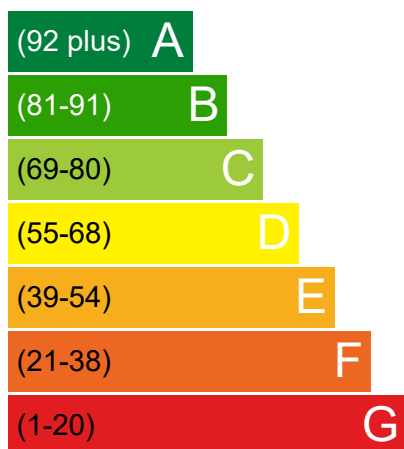
Dwelling Address	
Reference	88 St Pauls - conversion - R2-88 St Pauls - BG
SAP Version	10.2
Assessment Date	12/11/2025
Submission Date	
Property Type	Bungalow, Semi-Detached
Total Floor Area	40

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

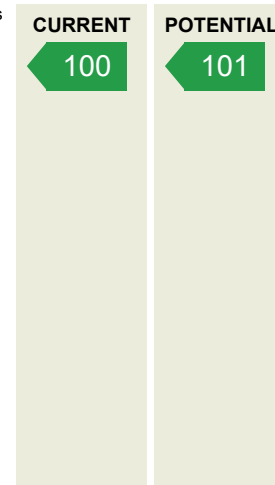
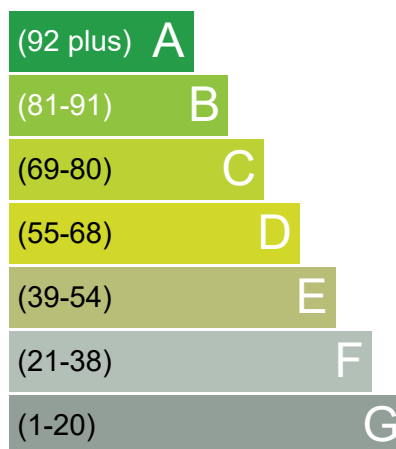
Energy Efficiency Rating

Most energy efficient - lower running costs



Carbon Dioxide (CO2) Emissions Rating

Very environmentally friendly - lower CO2 emissions



Additional ratings for your home

Energy Report

	Primary Energy	Energy	Carbon	Cost	HTC
CURRENT	19.72 kWh	-879 kWh	-64 kg	169.90 £	95 W/K
POTENTIAL	12.06 kWh	-1189 kWh	-101 kg	115.40 £	95 W/K

Breakdown of property's energy performance

Each feature is assessed as one of the following:

Very Poor	Poor	Average	Good	Very Good
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Feature	Description	Energy Performance
Walls	Average thermal transmittance 0.2 W/m ² K	Very Good
Roof	Average thermal transmittance 0.12 W/m ² K	Very Good
Floor	Average thermal transmittance 0.15 W/m ² K	Very Good
Windows	High performance glazing	Very Good
Main heating	Air source heat pump, radiators, electric	Good
Main heating controls	Time and temperature zone control	Very Good
Secondary heating	None	
Hot water	From main system	Average
Lighting	Excellent lighting efficiency	Very Good
Air tightness	Air permeability [AP50] = 8.0 m ³ /h.m ² (assumed)	Average

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	£55	A 95	£4,000 - £7,000	£55	A 101

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		£26	£26	
Heating		£319	£342	
Hot Water		£320	£211	
New Technologies e.g. Impact of PV		-(£496)	-(£464)	
TOTAL		£170	£115	

Estimated energy use and potential savings



Space Heating

1154

kWh per year



Water Heating

1156

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.