

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	073 - PRJ013014			Issued on Date	27/05/2025
Assessment Reference	073	Prop Type Ref	1BFA		
Property	Flat 1, Hawker House, Paulet Close, Netley Abbey, SOUTHAMPTON, SO31 5JW				
SAP Rating	82 B	DER	6.85	TER	21.49
Environmental	96 A	% DER<TER	68.12		
CO ₂ Emissions (t/year)	0.07	DFEE	56.23	TFEE	58.28
General Requirements Compliance	Pass	% DFEE<TFEE	3.50		
Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk			Assessor ID	U903-0001
Client					

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REGULATIONS COMPLIANCE REPORT - Approved Document L1A, 2013 Edition, England

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DWELLING AS BUILT

Ground-floor flat, total floor area 57 m²

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

1a TER and DER

Fuel for main heating:Mains gas

Fuel factor:1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER) 21.49 kgCO₂/m²

Dwelling Carbon Dioxide Emission Rate (DER) 6.85 kgCO₂/m²OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)58.3 kWh/m²/yr

Dwelling Fabric Energy Efficiency (DFEE)56.2 kWh/m²/yrOK

2 Fabric U-values

Element	Average	Highest	
External wall	0.24 (max. 0.30)	0.32 (max. 0.70)	OK
Floor	0.19 (max. 0.25)	0.19 (max. 0.70)	OK
Roof	0.08 (max. 0.20)	0.08 (max. 0.35)	OK
Openings	1.36 (max. 2.00)	1.40 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals:	3.78 (measured in this dwelling)	
Maximum	10.0	OK

4 Heating efficiency

Main heating system: Boiler system with radiators or underfloor - Mains gas

Data from database

Vaillant ecoFIT sustain 830 VUW 306/6-3 (H-GB)

Combi boiler

Efficiency: 89.3% SEDBUK2009

Minimum: 88.0% OK

Secondary heating system: None

5 Cylinder insulation

Hot water storage No cylinder

6 Controls

Space heating controls: Programmer, room thermostat and TRVs OK

Hot water controls: No cylinder

Boiler interlock Yes OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings:100%

Minimum 75% OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Southern England): Not significant OK

Based on:

Overshading:

Average

Windows facing South East: 4.42 m², No overhang

Windows facing North West: 2.89 m², No overhang

Air change rate: 5.21 ach

Blinds/curtains: Dark-coloured curtain or roller blind, closed 100% of daylight hours

10 Key features

Roof U-value 0.08 W/m²K

Air permeability 3.8 m³/m²h

Photovoltaic array 2.00 kW

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CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Built) (Version 9.92, January 2014)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	56.5700 (1b)	x 2.3900 (2b)	= 135.2023 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	56.5700		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 135.2023 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour
Number of chimneys	0	+	0	=	0 * 40 = 0.0000 (6a)
Number of open flues	0	+	0	=	0 * 20 = 0.0000 (6b)
Number of intermittent 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)+(7a)+(7b)+(7c) =					Air changes per hour
Pressure test					20.0000 / (5) = 0.1479 (8)
Measured/design AP50					Yes
Infiltration rate					3.7800
Number of sides sheltered					0.3369 (18)
					0 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	1.0000 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.3369 (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												
	0.4296	0.4212	0.4127	0.3706	0.3622	0.3201	0.3201	0.3117	0.3369	0.3622	0.3790	0.3959 (22b)
Effective ac	0.5923	0.5887	0.5852	0.5687	0.5656	0.5512	0.5512	0.5486	0.5568	0.5656	0.5718	0.5784 (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
Solid Door			2.1100	1.2000	2.5320		(26)
Windows (Uw = 1.40)			7.3100	1.3258	9.6913		(27)
Flr - Ground			56.5700	0.1900	10.7483	75.6000	4276.6920 (28a)
Wl - Brick (Timber Frame)	57.0240	9.4150	47.6090	0.2100	9.9979	7.4000	352.3066 (29a)
Wl - Corridor	15.6850		15.6850	0.3200	5.0192	13.4400	210.8064 (29a)
Rf - Joist over Side	5.8970		5.8970	0.0800	0.4718	7.4000	43.6378 (30)
Total net area of external elements Aum(A, m ²)			135.1810				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	38.4604		(33)
Party Ceiling			50.6720			7.4000	374.9728 (32b)
Stud			101.3141			7.4000	749.7242 (32c)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 6008.1398 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							106.2072 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							12.5444 (36)
Total fabric heat loss							(33) + (36) = 51.0048 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(38)m	26.4252	26.2653	26.1086	25.3726	25.2349	24.5939	24.5939	24.4752	24.8408	25.2349	25.5135	25.8047 (38)
Heat transfer coeff	77.4300	77.2701	77.1135	76.3775	76.2398	75.5987	75.5987	75.4800	75.8457	76.2398	76.5183	76.8096 (39)
Average = Sum(39)m / 12 =												76.3768 (39)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.3687	1.3659	1.3632	1.3501	1.3477	1.3364	1.3364	1.3343	1.3407	1.3477	1.3526	1.3578 (40)
HLP (average)												1.3501 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.8832 (42)
Average daily hot water use (litres/day)												78.9258 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	86.8183	83.6613	80.5043	77.3472	74.1902	71.0332	71.0332	74.1902	77.3472	80.5043	83.6613	86.8183 (44)
Energy conte	128.7491	112.6048	116.1980	101.3043	97.2038	83.8795	77.7267	89.1925	90.2578	105.1867	114.8196	124.6866 (45)
Energy content (annual)										Total = Sum(45)m =		1241.8094 (45)
Distribution loss (46)m = 0.15 x (45)m												
	19.3124	16.8907	17.4297	15.1956	14.5806	12.5819	11.6590	13.3789	13.5387	15.7780	17.2229	18.7030 (46)
Water storage loss:												

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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)
Combi loss	1.2854	1.0834	1.0758	0.9011	0.8293	0.6852	0.6349	0.7610	0.8028	0.9738	1.1047	1.2449 (61)
Total heat required for water heating calculated for each month	130.0345	113.6881	117.2738	102.2054	98.0332	84.5647	78.3616	89.9535	91.0606	106.1606	115.9242	125.9315 (62)
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 (63)
Output from w/h	130.0345	113.6881	117.2738	102.2054	98.0332	84.5647	78.3616	89.9535	91.0606	106.1606	115.9242	125.9315 (64)
Heat gains from water heating, kWh/month	43.1304	37.7119	38.9048	33.9089	32.5276	28.0612	26.0029	29.8468	30.2114	35.2180	38.4537	41.7695 (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	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	15.8870	14.1107	11.4756	8.6877	6.4942	5.4827	5.9242	7.7005	10.3356	13.1235	15.3170	16.3285 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	164.2214	165.9255	161.6312	152.4892	140.9490	130.1029	122.8570	121.1529	125.4472	134.5892	146.1293	156.9755 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159 (69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276 (71)
Water heating gains (Table 5)	57.9710	56.1189	52.2914	47.0957	43.7199	38.9739	34.9501	40.1166	41.9603	47.3361	53.4079	56.1418 (72)
Total internal gains	292.3272	290.4029	279.6460	262.5205	245.4109	228.8073	217.9791	223.2179	231.9909	249.2966	269.1021	283.6937 (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	
Southeast				4.4180	36.7938	0.5000	0.7200			0.7700	40.5543 (77)	
Northwest				2.8910	11.2829	0.5000	0.7200			0.7700	8.1378 (81)	
Solar gains	48.6920	85.6436	124.3611	166.1238	197.0569	200.4636	191.2576	167.4414	138.7074	96.5903	58.8141	41.3517 (83)
Total gains	341.0192	376.0465	404.0071	428.6443	442.4679	429.2709	409.2367	390.6592	370.6984	345.8868	327.9162	325.0454 (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	21.5540	21.5986	21.6425	21.8510	21.8905	22.0761	22.0761	22.1109	22.0043	21.8905	21.8108	21.7281	
alpha	2.4369	2.4399	2.4428	2.4567	2.4594	2.4717	2.4717	2.4741	2.4670	2.4594	2.4541	2.4485	
util living area	0.9711	0.9617	0.9452	0.9127	0.8534	0.7532	0.6351	0.6691	0.8214	0.9223	0.9608	0.9742 (86)	
MIT	18.2709	18.4943	18.9074	19.4791	20.0535	20.5400	20.7916	20.7539	20.3736	19.6466	18.8655	18.2278 (87)	
Th 2	19.7874	19.7896	19.7917	19.8018	19.8037	19.8124	19.8124	19.8141	19.8091	19.8037	19.7998	19.7959 (88)	
util rest of house	0.9661	0.9551	0.9350	0.8944	0.8177	0.6809	0.5140	0.5547	0.7645	0.9025	0.9528	0.9698 (89)	
MIT 2	17.3198	17.5423	17.9522	18.5197	19.0725	19.5208	19.7193	19.6965	19.3808	18.6913	17.9198	17.2829 (90)	
Living area fraction									fLA = Living area / (4) =				0.4596 (91)
MIT	17.7569	17.9798	18.3913	18.9606	19.5234	19.9892	20.2121	20.1825	19.8371	19.1304	18.3545	17.7172 (92)	
Temperature adjustment												-0.1500	
adjusted MIT	17.6069	17.8298	18.2413	18.8106	19.3734	19.8392	20.0621	20.0325	19.6871	18.9804	18.2045	17.5672 (93)	

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	325.2500	353.6551	370.7800	375.1760	354.8902	293.0998	222.0795	226.0716	280.7802	306.0470	307.6978	311.4979 (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	1030.3557	999.0905	905.4089	756.9490	585.0147	396.0773	261.7337	274.1793	423.7596	638.9169	849.6942	1026.7299 (97)
Month fracti	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000 (97a)
Space heating kWh	524.5986	433.7326	397.7639	274.8766	171.2126	0.0000	0.0000	0.0000	0.0000	247.6552	390.2374	532.1326 (98)
Space heating												2972.2096 (98)
Space heating per m2										(98) / (4) =		52.5404 (99)

8c. Space cooling requirement

Not applicable

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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 %)													90.2000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													3295.1325 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	524.5986	433.7326	397.7639	274.8766	171.2126	0.0000	0.0000	0.0000	0.0000	247.6552	390.2374	532.1326	(98)
Space heating efficiency (main heating system 1)	90.2000	90.2000	90.2000	90.2000	90.2000	0.0000	0.0000	0.0000	0.0000	90.2000	90.2000	90.2000	(210)
Space heating fuel (main heating system)	581.5949	480.8566	440.9800	304.7412	189.8144	0.0000	0.0000	0.0000	0.0000	274.5623	432.6357	589.9475	(211)
Water heating 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	(215)
Water heating requirement	130.0345	113.6881	117.2738	102.2054	98.0332	84.5647	78.3616	89.9535	91.0606	106.1606	115.9242	125.9315	(64)
Efficiency of water heater (217)m	87.0241	86.8848	86.5780	85.9213	84.5444	76.2000	76.2000	76.2000	76.2000	85.4874	86.5578	76.2000	(216)
Fuel for water heating, kWh/month	149.4236	130.8493	135.4544	118.9523	115.9547	110.9773	102.8368	118.0492	119.5021	124.1827	133.9270	144.5223	(219)
Water heating fuel used												1504.6319	(219)
Annual totals kWh/year													
Space heating fuel - main system												3295.1325	(211)
Space heating fuel - secondary												0.0000	(215)
Electricity for pumps and fans:													
central heating pump												30.0000	(230c)
main heating flue fan												45.0000	(230e)
Total electricity for the above, kWh/year												75.0000	(231)
Electricity for lighting (calculated in Appendix L)												280.5690	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV Unit 0 (0.80 * 2.00 * 1004 * 1.00) =												-1606.3939	(233)
Total delivered energy for all uses												3548.9395	(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	3295.1325	0.2160	711.7486 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1504.6319	0.2160	325.0005 (264)
Space and water heating			1036.7491 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	280.5690	0.5190	145.6153 (268)
Energy saving/generation technologies			
PV Unit	-1606.3939	0.5190	-833.7184 (269)
Total CO2, kg/year			387.5710 (272)
Dwelling Carbon Dioxide Emission Rate (DER)			6.8500 (273)

16 CO2 EMISSIONS ASSOCIATED WITH APPLIANCES AND COOKING AND SITE-WIDE ELECTRICITY GENERATION TECHNOLOGIES

DER		6.8500	ZC1
Total Floor Area	TFA	56.5700	
Assumed number of occupants	N	1.8832	
CO2 emission factor in Table 12 for electricity displaced from grid	EF	0.5190	
CO2 emissions from appliances, equation (L14)		17.2024	ZC2
CO2 emissions from cooking, equation (L16)		2.9025	ZC3
Total CO2 emissions		26.9550	ZC4
Residual CO2 emissions offset from biofuel CHP		0.0000	ZC5
Additional allowable electricity generation, kWh/m²/year		0.0000	ZC6
Resulting CO2 emissions offset from additional allowable electricity generation		0.0000	ZC7
Net CO2 emissions		26.9550	ZC8

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1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	56.5700 (1b)	x 2.3900 (2b)	= 135.2023 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	56.5700		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 135.2023 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour
Number of chimneys	0	+	0	=	0 * 40 = 0.0000 (6a)
Number of open flues	0	+	0	=	0 * 20 = 0.0000 (6b)
Number of intermittent 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)+(7a)+(7b)+(7c) =				20.0000 / (5) = 0.1479 (8)
Pressure test					Yes
Measured/design AP50					5.0000
Infiltration rate					0.3979 (18)
Number of sides sheltered					0 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] =				1.0000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =				0.3979 (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	0.5074	0.4974	0.4875	0.4377	0.4278	0.3780	0.3780	0.3681	0.3979	0.4278	0.4477	0.4676 (22b)
Effective ac	0.6287	0.6237	0.6188	0.5958	0.5915	0.5715	0.5715	0.5677	0.5792	0.5915	0.6002	0.6093 (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					
TER Opaque door			2.1100	1.0000	2.1100		(26)					
TER Opening Type (Uw = 1.40)			7.3100	1.3258	9.6913		(27)					
F1r - Ground			56.5700	0.1300	7.3541		(28a)					
W1 - Brick (Timber Frame)	57.0240	9.4150	47.6090	0.1800	8.5696		(29a)					
W1 - Corridor	15.6850		15.6850	0.1800	2.8233		(29a)					
Rf - Joist over Side	5.8970		5.8970	0.1300	0.7666		(30)					
Total net area of external elements Aum(A, m2)			135.1810				(31)					
Fabric heat loss, W/K = Sum (A x U)			(26) ... (30) + (32) =		31.3149		(33)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.0000 (35)					
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							10.6648 (36)					
Total fabric heat loss						(33) + (36) =	41.9797 (37)					
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan 28.0508	Feb 27.8278	Mar 27.6092	Apr 26.5826	May 26.3905	Jun 25.4964	Jul 25.4964	Aug 25.3308	Sep 25.8408	Oct 26.3905	Nov 26.7791	Dec 27.1853 (38)
Heat transfer coeff	70.0305	69.8075	69.5890	68.5623	68.3703	67.4761	67.4761	67.3105	67.8205	68.3703	68.7588	69.1651 (39)
Average = Sum(39)m / 12 =												68.5614 (39)
HLP	Jan 1.2379	Feb 1.2340	Mar 1.2301	Apr 1.2120	May 1.2086	Jun 1.1928	Jul 1.1928	Aug 1.1899	Sep 1.1989	Oct 1.2086	Nov 1.2155	Dec 1.2226 (40)
HLP (average)												1.2120 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.8832 (42)
Average daily hot water use (litres/day)												78.9258 (43)
Daily hot water use	86.8183	83.6613	80.5043	77.3472	74.1902	71.0332	71.0332	74.1902	77.3472	80.5043	83.6613	86.8183 (44)
Energy conte	128.7491	112.6048	116.1980	101.3043	97.2038	83.8795	77.7267	89.1925	90.2578	105.1867	114.8196	124.6866 (45)
Energy content (annual)										Total = Sum(45)m =		1241.8094 (45)
Distribution loss (46)m = 0.15 x (45)m												
	19.3124	16.8907	17.4297	15.1956	14.5806	12.5819	11.6590	13.3789	13.5387	15.7780	17.2229	18.7030 (46)
Water storage 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												

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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 (57)
Total heat required for water heating calculated for each month	44.2417	38.5071	41.0241	38.1438	37.8065	35.0301	36.1977	37.8065	38.1438	41.0241	41.2576	44.2417 (61)
Solar input	172.9907	151.1119	157.2221	139.4481	135.0104	118.9096	113.9244	126.9991	128.4016	146.2108	156.0772	168.9283 (62)
Output from w/h	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63)
Heat gains from water heating, kWh/month	172.9907	151.1119	157.2221	139.4481	135.0104	118.9096	113.9244	126.9991	128.4016	146.2108	156.0772	168.9283 (64)
	53.8695	47.0679	48.8919	43.2196	41.7719	36.6475	34.8936	39.1081	39.5467	45.2306	48.4919	52.5187 (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	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595	94.1595	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	15.9863	14.1989	11.5473	8.7420	6.5348	5.5169	5.9612	7.7487	10.4002	13.2055	15.4127	16.4306	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	164.2214	165.9255	161.6312	152.4892	140.9490	130.1029	122.8570	121.1529	125.4472	134.5892	146.1293	156.9755	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159	32.4159	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	-75.3276	(71)
Water heating gains (Table 5)	72.4052	70.0415	65.7149	60.0273	56.1450	50.8992	46.9000	52.5647	54.9259	60.7938	67.3499	70.5897	(72)
Total internal gains	306.8607	304.4136	293.1412	275.5063	257.8766	240.7669	229.9660	235.7141	245.0212	262.8363	283.1398	298.2436	(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	
Southeast				4.4180	36.7938	0.6300		0.7000	0.7700		49.6790 (77)	
Northwest				2.8910	11.2829	0.6300		0.7000	0.7700		9.9688 (81)	
Solar gains	59.6478	104.9134	152.3423	203.5017	241.3947	245.5679	234.2905	205.1157	169.9166	118.3231	72.0473	50.6559 (83)
Total gains	366.5085	409.3271	445.4835	479.0080	499.2714	486.3348	464.2565	440.8298	414.9378	381.1594	355.1871	348.8994 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Thl (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	56.0966	56.2758	56.4525	57.2978	57.4588	58.2202	58.2202	58.3634	57.9245	57.4588	57.1341	56.7985	
alpha	4.7398	4.7517	4.7635	4.8199	4.8306	4.8813	4.8813	4.8909	4.8616	4.8306	4.8089	4.7866	
util living area	0.9972	0.9947	0.9885	0.9688	0.9116	0.7772	0.6115	0.6599	0.8752	0.9766	0.9946	0.9978	(86)
MIT	19.6862	19.8280	20.0695	20.3999	20.7032	20.9113	20.9786	20.9692	20.8275	20.4434	20.0116	19.6665	(87)
Th 2	19.8898	19.8929	19.8960	19.9104	19.9131	19.9258	19.9258	19.9281	19.9209	19.9131	19.9076	19.9019	(88)
util rest of house	0.9962	0.9929	0.9843	0.9561	0.8733	0.6859	0.4761	0.5263	0.8081	0.9646	0.9924	0.9970	(89)
MIT 2	18.1508	18.3597	18.7127	19.1965	19.6111	19.8636	19.9176	19.9149	19.7776	19.2657	18.6385	18.1305	(90)
Living area fraction									fLA = Living area / (4) =			0.4596	(91)
MIT	18.8565	19.0346	19.3363	19.7496	20.1130	20.3451	20.4052	20.3995	20.2601	19.8070	19.2696	18.8365	(92)
Temperature adjustment												0.0000	
adjusted MIT	18.8565	19.0346	19.3363	19.7496	20.1130	20.3451	20.4052	20.3995	20.2601	19.8070	19.2696	18.8365	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Useful gains	0.9950	0.9910	0.9814	0.9538	0.8815	0.7245	0.5389	0.5881	0.8322	0.9631	0.9906	0.9960	(94)
Ext temp.	364.6629	405.6423	437.2121	456.8562	440.0846	352.3553	250.1903	259.2689	345.3201	367.0792	351.8460	347.5008	(95)
Heat loss rate W	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)
Month fracti	1019.3969	986.6991	893.2643	743.8726	575.2024	387.6575	256.7625	269.2065	417.7839	629.4859	836.7668	1012.3314	(97)
Space heating kWh	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	(97a)
Space heating per m2	487.1220	390.4701	339.3028	206.6518	100.5276	0.0000	0.0000	0.0000	0.0000	195.2306	349.1430	494.6340	(98)
												2563.0820	(98)
												45.3081	(99)

8c. Space cooling requirement

Not applicable

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

FULL SAP CALCULATION PRINTOUT

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CALCULATION OF TARGET EMISSIONS 09 Jan 2014

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 %)													93.4000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													2744.1991 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	487.1220	390.4701	339.3028	206.6518	100.5276	0.0000	0.0000	0.0000	0.0000	195.2306	349.1430	494.6340	(98)
Space heating efficiency (main heating system 1)	93.4000	93.4000	93.4000	93.4000	93.4000	0.0000	0.0000	0.0000	0.0000	93.4000	93.4000	93.4000	(210)
Space heating fuel (main heating system)	521.5439	418.0622	363.2793	221.2546	107.6313	0.0000	0.0000	0.0000	0.0000	209.0263	373.8148	529.5867	(211)
Water heating 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	(215)
Water heating requirement	172.9907	151.1119	157.2221	139.4481	135.0104	118.9096	113.9244	126.9991	128.4016	146.2108	156.0772	168.9283	(64)
Efficiency of water heater	87.5153	87.3350	86.9375	86.0397	84.3208	80.3000	80.3000	80.3000	80.3000	85.7799	87.0187	87.5952	(217)
Fuel for water heating, kWh/month	197.6691	173.0255	180.8449	162.0741	160.1151	148.0817	141.8735	158.1557	159.9024	170.4489	179.3604	192.8511	(219)
Water heating fuel used												2024.4026	(219)
Annual totals kWh/year													
Space heating fuel - main system												2744.1991	(211)
Space heating fuel - secondary												0.0000	(215)
Electricity for pumps and fans:													
central heating pump												30.0000	(230c)
main heating flue fan												45.0000	(230e)
Total electricity for the above, kWh/year												75.0000	(231)
Electricity for lighting (calculated in Appendix L)												282.3228	(232)
Total delivered energy for all uses												5125.9245	(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	2744.1991	0.2160	592.7470 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	2024.4026	0.2160	437.2710 (264)
Space and water heating			1030.0180 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	282.3228	0.5190	146.5255 (268)
Total CO2, kg/m2/year			1215.4685 (272)
Emissions per m2 for space and water heating			18.2078 (272a)
Fuel factor (mains gas)			1.0000
Emissions per m2 for lighting			2.5902 (272b)
Emissions per m2 for pumps and fans			0.6881 (272c)
Target Carbon Dioxide Emission Rate (TER) = (18.2078 * 1.00) + 2.5902 + 0.6881, rounded to 2 d.p.			21.4900 (273)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Property Reference	073 - PRJ013014	Issued on Date	27/05/2025
Assessment Reference	073	Prop Type Ref	1BFA
Property	Flat 1, Hawker House, Paulet Close, Netley Abbey, SOUTHAMPTON, SO31 5JW		
SAP Rating	82 B	DER	6.85
Environmental	96 A	TER	21.49
CO ₂ Emissions (t/year)	0.07	% DER<TER	68.12
General Requirements Compliance	Pass	DFEE	56.23
		TFEE	58.28
		% DFEE<TFEE	3.50
Assessor Details	Mr. Christopher Nicholls, Briary Energy Limited, Tel: 0203 397 1373, chris@briaryenergy.co.uk		Assessor ID
			U903-0001
Client			

SUMMARY FOR INPUT DATA FOR New Build (As Built)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Mains gas		
Fuel factor	1.00 (mains gas)		
Target Carbon Dioxide Emission Rate (TER)	21.49	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	6.85	kgCO ₂ /m ²	Pass
	-14.64 (-68.1%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	58.28	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	56.23	kWh/m ² /yr	
	-2.1 (-3.6%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.24 (max. 0.30)	0.32 (max. 0.70)	Pass
Floor	0.19 (max. 0.25)	0.19 (max. 0.70)	Pass
Roof	0.08 (max. 0.20)	0.08 (max. 0.35)	Pass
Openings	1.36 (max. 2.00)	1.40 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.78 (measured in this dwelling)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor - Mains gas Data from database Vaillant ecoFIT sustain 830 VUW 306/6-3 (H-GB) Combi boiler Efficiency: 89.3% SEDBUK2009 Minimum: 88.0%	Pass
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BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Secondary heating system

None

5 Cylinder insulation

Hot water storage

No cylinder

6 Controls

Space heating controls

Programmer, room thermostat and TRVs

Pass

Hot water controls

No cylinder

Boiler interlock

Yes

Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings

100

%

Minimum

75

%

Pass

8 Mechanical ventilation

Not applicable

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Southern England)

Not significant

Pass

Based on:

Overshading

Average

Windows facing South East

4.42 m², No overhang

Windows facing North West

2.89 m², No overhang

Air change rate

5.21 ach

Blinds/curtains

Dark-coloured curtain or roller blind, closed 100% of daylight hours

Criterion 4 – Building performance consistent with DER and DFEE rate

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

3.78 (measured in this dwelling)

Maximum

10.0

Pass

10 Key features

Roof U-value

0.08

W/m²K

Air permeability

3.8

m³/m²h

Photovoltaic array

2.00

kW

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.