

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

Property Reference	074 - PRJ013014			Issued on Date	27/05/2025
Assessment Reference	074	Prop Type Ref	1BFA		
Property	Flat 2, Hawker House, Paulet Close, Netley Abbey, SOUTHAMPTON, SO31 5JW				
SAP Rating	81 B	DER	6.14	TER	22.10
Environmental	97 A	% DER<TER	72.22		
CO ₂ Emissions (t/year)	0.02	DFEE	58.03	TFEE	59.52
General Requirements Compliance	Pass	% DFEE<TFEE	2.51		
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 52 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) 22.10 kgCO₂/m²
Dwelling Carbon Dioxide Emission Rate (DER) 6.14 kgCO₂/m²OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)59.5 kWh/m²/yr
Dwelling Fabric Energy Efficiency (DFEE)58.0 kWh/m²/yrOK

2 Fabric U-values

Element	Average	Highest	
External wall	0.24 (max. 0.30)	0.32 (max. 0.70)	OK
Floor	0.20 (max. 0.25)	0.20 (max. 0.70)	OK
Roof (no roof)			
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:	3.99 (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 North East: 3.64 m², No overhang
Windows facing South East: 3.06 m², No overhang
Windows facing North West: 0.72 m², No overhang
Air change rate: 5.28 ach
Blinds/curtains: Dark-coloured curtain or roller blind, closed 100% of daylight hours

10 Key features

Air permeability	4.0 m ³ /m ² h
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)
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1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	51.6500 (1b)	x 2.3900 (2b)	= 123.4435 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	51.6500		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 123.4435 (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) =	0.1620 (8)
Pressure test					Yes
Measured/design AP50					3.9900
Infiltration rate					0.3615 (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) =		0.3615 (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												
Effective ac	0.4609	0.4519	0.4429	0.3977	0.3886	0.3434	0.3434	0.3344	0.3615	0.3886	0.4067	0.4248 (22b)
Effective ac	0.6062	0.6021	0.5981	0.5791	0.5755	0.5590	0.5590	0.5559	0.5653	0.5755	0.5827	0.5902 (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			1.6800	1.2000	2.0160		(26)
Windows (Uw = 1.40)			7.4200	1.3258	9.8371		(27)
Flr - Ground			51.6500	0.2000	10.3300	75.6000	3904.7400 (28a)
Wl - Brick (Timber Frame)	48.7760	7.4180	41.3580	0.2100	8.6852	7.4000	306.0492 (29a)
Wl - Clad (Timber Frame)			5.2850	0.2100	1.1099	7.4000	39.1090 (29a)
Wl - Corridor	15.6850	1.6760	14.0090	0.3200	4.4829	13.4400	188.2810 (29a)
Total net area of external elements Aum(A, m ²)			121.4020				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	36.4610		(33)
Party Ceiling			51.6530			7.4000	382.2322 (32b)
Stud			92.5137			7.4000	684.6016 (32c)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 5505.0130 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							106.5830 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							11.2301 (36)
Total fabric heat loss							(33) + (36) = 47.6911 (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	24.6956	24.5276	24.3629	23.5892	23.4445	22.7706	22.7706	22.6459	23.0302	23.4445	23.7373	24.0434 (38)
Heat transfer coeff	72.3867	72.2187	72.0540	71.2803	71.1356	70.4618	70.4618	70.3370	70.7213	71.1356	71.4284	71.7346 (39)
Average = Sum(39)m / 12 =												71.2797 (39)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.4015	1.3982	1.3950	1.3801	1.3773	1.3642	1.3642	1.3618	1.3692	1.3773	1.3829	1.3889 (40)
HLP (average)												1.3801 (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												1.7387 (42)
Average daily hot water use (litres/day)												75.4952 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	83.0447	80.0249	77.0051	73.9853	70.9655	67.9457	67.9457	70.9655	73.9853	77.0051	80.0249	83.0447 (44)
Energy content (annual)	123.1529	107.7103	111.1474	96.9010	92.9788	80.2337	74.3483	85.3157	86.3347	100.6147	109.8288	119.2670 (45)
Distribution loss (46)m = 0.15 x (45)m										Total = Sum(45)m =		1187.8334 (45)
Water storage loss:	18.4729	16.1565	16.6721	14.5352	13.9468	12.0350	11.1522	12.7974	12.9502	15.0922	16.4743	17.8901 (46)

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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	1.1761	0.9912	0.9843	0.8245	0.7588	0.6269	0.5809	0.6963	0.7346	0.8910	1.0107	1.1390 (61)
Total heat required for water heating calculated for each month	124.3290	108.7016	112.1317	97.7255	93.7376	80.8606	74.9292	86.0120	87.0692	101.5057	110.8396	120.4060 (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	124.3290	108.7016	112.1317	97.7255	93.7376	80.8606	74.9292	86.0120	87.0692	101.5057	110.8396	120.4060 (64)
Heat gains from water heating, kWh/month	41.2424	36.0615	37.2026	32.4257	31.1052	26.8344	24.8660	28.5415	28.8899	33.6771	36.7708	39.9410 (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	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	14.3253	12.7236	10.3475	7.8337	5.8558	4.9437	5.3419	6.9435	9.3196	11.8334	13.8113	14.7234	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	151.5179	153.0902	149.1281	140.6933	130.0458	120.0387	113.3533	111.7810	115.7431	124.1780	134.8254	144.8326	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	(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)	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	(71)
Water heating gains (Table 5)	55.4333	53.6629	50.0035	45.0357	41.8080	37.2700	33.4221	38.3623	40.1249	45.2650	51.0705	53.6842	(72)
Total internal gains	273.3577	271.5579	261.5603	245.6439	229.7908	214.3336	204.1984	209.1680	217.2688	233.3575	251.7884	265.3213	(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			
Northeast				3.6350	11.2829	0.5000	0.7200	0.7700	10.2320 (75)			
Southeast				3.0640	36.7938	0.5000	0.7200	0.7700	28.1255 (77)			
Northwest				0.7190	11.2829	0.5000	0.7200	0.7700	2.0239 (81)			
Solar gains	40.3814	72.8554	110.4970	155.0356	190.1959	196.0973	186.0304	158.6868	125.7454	83.4362	49.1089	34.0783 (83)
Total gains	313.7391	344.4133	372.0573	400.6794	419.9867	410.4309	390.2289	367.8548	343.0142	316.7937	300.8974	299.3997 (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	21.1250	21.1742	21.2226	21.4529	21.4966	21.7021	21.7021	21.7406	21.6225	21.4966	21.4084	21.3171	
alpha	2.4083	2.4116	2.4148	2.4302	2.4331	2.4468	2.4468	2.4494	2.4415	2.4331	2.4272	2.4211	
util living area	0.9710	0.9620	0.9452	0.9105	0.8470	0.7425	0.6246	0.6633	0.8212	0.9232	0.9609	0.9740	(86)
MIT	18.2241	18.4451	18.8679	19.4620	20.0540	20.5459	20.7942	20.7527	20.3604	19.6164	18.8272	18.1846	(87)
Th 2	19.7622	19.7647	19.7671	19.7787	19.7808	19.7909	19.7909	19.7927	19.7870	19.7808	19.7764	19.7719	(88)
util rest of house	0.9659	0.9553	0.9349	0.8916	0.8097	0.6680	0.5017	0.5469	0.7635	0.9034	0.9529	0.9695	(89)
MIT 2	17.2565	17.4769	17.8965	18.4863	19.0547	19.5064	19.7006	19.6763	19.3519	18.6460	17.8660	17.2238	(90)
Living area fraction	17.7469	17.9676	18.3889	18.9809	19.5612	20.0333	20.2549	20.2219	19.8631	19.1379	18.3532	17.7108	(92)
Temperature adjustment	17.5969	17.8176	18.2389	18.8309	19.4112	19.8833	20.1049	20.0719	19.7131	18.9879	18.2032	17.5608	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Useful gains	0.9537	0.9410	0.9179	0.8731	0.7961	0.6745	0.5373	0.5773	0.7592	0.8866	0.9387	0.9581	(94)
Ext temp.	299.2045	324.0851	341.5288	349.8511	334.3527	276.8329	209.6520	212.3646	260.4212	280.8638	282.4655	286.8579	(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	962.5211	932.8946	845.8348	707.8761	548.5414	372.2702	246.9608	258.2719	396.9644	596.6753	793.0873	958.4313	(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	(98)
Space heating per m2	493.5075	409.1200	375.2036	257.7780	159.3564	0.0000	0.0000	0.0000	0.0000	234.9638	367.6477	499.6506	(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													3101.1394 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	493.5075	409.1200	375.2036	257.7780	159.3564	0.0000	0.0000	0.0000	0.0000	234.9638	367.6477	499.6506	(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)	547.1259	453.5698	415.9686	285.7850	176.6701	0.0000	0.0000	0.0000	0.0000	260.4920	407.5917	553.9364	(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	124.3290	108.7016	112.1317	97.7255	93.7376	80.8606	74.9292	86.0120	87.0692	101.5057	110.8396	120.4060	(64)
Efficiency of water heater (217)m	86.9840	86.8503	86.5415	85.8634	84.4533	76.2000	76.2000	76.2000	76.2000	85.4631	86.5178	87.0928	(216)
Fuel for water heating, kWh/month	142.9332	125.1596	129.5698	113.8150	110.9935	106.1162	98.3323	112.8766	114.2641	118.7715	128.1118	138.2503	(219)
Water heating fuel used												1439.1939	(219)
Annual totals kWh/year													
Space heating fuel - main system												3101.1394	(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)												252.9885	(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												3261.9279	(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	3101.1394	0.2160	669.8461 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1439.1939	0.2160	310.8659 (264)
Space and water heating			980.7120 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	252.9885	0.5190	131.3010 (268)
Energy saving/generation technologies			
PV Unit	-1606.3939	0.5190	-833.7184 (269)
Total CO2, kg/year			317.2196 (272)
Dwelling Carbon Dioxide Emission Rate (DER)			6.1400 (273)

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

DER		6.1400	ZC1
Total Floor Area		51.6500	
Assumed number of occupants		1.7387	
CO2 emission factor in Table 12 for electricity displaced from grid		0.5190	
CO2 emissions from appliances, equation (L14)		17.3836	ZC2
CO2 emissions from cooking, equation (L16)		3.1119	ZC3
Total CO2 emissions		26.6355	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		26.6355	ZC8

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1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	51.6500 (1b)	x 2.3900 (2b)	= 123.4435 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	51.6500		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 123.4435 (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) = 0.1620 (8)
Pressure test					Yes
Measured/design AP50					5.0000
Infiltration rate					0.4120 (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) =				0.4120 (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												
Effective ac	0.5253	0.5150	0.5047	0.4532	0.4429	0.3914	0.3914	0.3811	0.4120	0.4429	0.4635	0.4841 (22b)
Effective ac	0.6380	0.6326	0.6274	0.6027	0.5981	0.5766	0.5766	0.5726	0.5849	0.5981	0.6074	0.6172 (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			1.6800	1.0000	1.6800			(26)					
TER Opening Type (Uw = 1.40)			7.4200	1.3258	9.8371			(27)					
F1r - Ground			51.6500	0.1300	6.7145			(28a)					
W1 - Brick (Timber Frame)	48.7760	7.4180	41.3580	0.1800	7.4444			(29a)					
W1 - Clad (Timber Frame)	5.2850		5.2850	0.1800	0.9513			(29a)					
W1 - Corridor	15.6850	1.6760	14.0090	0.1800	2.5216			(29a)					
Total net area of external elements Aum(A, m2)			121.4020					(31)					
Fabric heat loss, W/K = Sum (A x U)			(26) ... (30) + (32) =			29.1490		(33)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K								250.0000 (35)					
Thermal bridges (Sum(L x Psi) calculated using Appendix K)								9.6041 (36)					
Total fabric heat loss						(33) + (36) =	38.7531	(37)					
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)													
(38)m	Jan 25.9891	Feb 25.7708	Mar 25.5568	Apr 24.5520	May 24.3639	Jun 23.4887	Jul 23.4887	Aug 23.3266	Sep 23.8258	Oct 24.3639	Nov 24.7443	Dec 25.1419	(38)
Heat transfer coeff	64.7421	64.5239	64.3099	63.3050	63.1170	62.2418	62.2418	62.0797	62.5789	63.1170	63.4974	63.8950	(39)
Average = Sum(39)m / 12 =												63.3041	(39)
HLP	Jan 1.2535	Feb 1.2493	Mar 1.2451	Apr 1.2257	May 1.2220	Jun 1.2051	Jul 1.2051	Aug 1.2019	Sep 1.2116	Oct 1.2220	Nov 1.2294	Dec 1.2371	(40)
HLP (average)												1.2256	(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												1.7387 (42)
Average daily hot water use (litres/day)												75.4952 (43)
Daily hot water use	83.0447	80.0249	77.0051	73.9853	70.9655	67.9457	67.9457	70.9655	73.9853	77.0051	80.0249	83.0447 (44)
Energy conte	123.1529	107.7103	111.1474	96.9010	92.9788	80.2337	74.3483	85.3157	86.3347	100.6147	109.8288	119.2670 (45)
Energy content (annual)										Total = Sum(45)m =		1187.8334 (45)
Distribution loss (46)m = 0.15 x (45)m												
Water storage loss:	18.4729	16.1565	16.6721	14.5352	13.9468	12.0350	11.1522	12.7974	12.9502	15.0922	16.4743	17.8901 (46)
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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CALCULATION OF TARGET EMISSIONS 09 Jan 2014

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	42.3187	36.8334	39.2410	36.4859	36.1632	33.5075	34.6244	36.1632	36.4859	39.2410	39.4643	42.3187 (61)
Solar input	165.4716	144.5437	150.3884	133.3869	129.1420	113.7411	108.9726	121.4790	122.8206	139.8557	149.2932	161.5857 (62)
	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	165.4716	144.5437	150.3884	133.3869	129.1420	113.7411	108.9726	121.4790	122.8206	139.8557	149.2932	161.5857 (64)
Heat gains from water heating, kWh/month	51.5280	45.0220	46.7668	41.3411	39.9563	35.0546	33.3769	37.4083	37.8278	43.2646	46.3842	50.2360 (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	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	86.9373	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	14.4117	12.8003	10.4099	7.8810	5.8911	4.9735	5.3741	6.9854	9.3758	11.9048	13.8946	14.8122	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	151.5179	153.0902	149.1281	140.6933	130.0458	120.0387	113.3533	111.7810	115.7431	124.1780	134.8254	144.8326	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	31.6937	(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)	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	-69.5498	(71)
Water heating gains (Table 5)	69.2581	66.9971	62.8585	57.4181	53.7047	48.6869	44.8614	50.2800	52.5385	58.1514	64.4225	67.5214	(72)
Total internal gains	287.2689	284.9688	274.4777	258.0736	241.7228	225.7803	215.6700	221.1276	229.7387	246.3153	265.2237	279.2474	(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	
Northeast				3.6350	11.2829		0.6300	0.7000	0.7700		12.5343 (75)	
Southeast				3.0640	36.7938		0.6300	0.7000	0.7700		34.4537 (77)	
Northwest				0.7190	11.2829		0.6300	0.7000	0.7700		2.4793 (81)	
Solar gains	49.4672	89.2478	135.3588	189.9186	232.9900	240.2192	227.8873	194.3913	154.0382	102.2093	60.1585	41.7460 (83)
Total gains	336.7361	374.2166	409.8366	447.9921	474.7127	465.9994	443.5573	415.5189	383.7768	348.5247	325.3822	320.9934 (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	55.4014	55.5888	55.7738	56.6591	56.8279	57.6270	57.6270	57.7774	57.3165	56.8279	56.4875	56.1359	
alpha	4.6934	4.7059	4.7183	4.7773	4.7885	4.8418	4.8418	4.8518	4.8211	4.7885	4.7658	4.7424	
util living area	0.9971	0.9947	0.9883	0.9665	0.9022	0.7580	0.5931	0.6481	0.8731	0.9768	0.9946	0.9977	(86)
MIT	19.6696	19.8095	20.0573	20.4027	20.7151	20.9188	20.9806	20.9707	20.8261	20.4329	19.9980	19.6519	(87)
Th 2	19.8775	19.8808	19.8841	19.8995	19.9024	19.9159	19.9159	19.9185	19.9107	19.9024	19.8966	19.8905	(88)
util rest of house	0.9961	0.9929	0.9840	0.9530	0.8611	0.6647	0.4591	0.5144	0.8051	0.9648	0.9923	0.9969	(89)
MIT 2	18.1181	18.3242	18.6865	19.1918	19.6160	19.8602	19.9087	19.9061	19.7668	19.2430	18.6111	18.1011	(90)
Living area fraction	18.9045	19.0770	19.3813	19.8056	20.1731	20.3968	20.4520	20.4457	20.3038	19.8461	19.3141	18.8871	(92)
MIT	18.9045	19.0770	19.3813	19.8056	20.1731	20.3968	20.4520	20.4457	20.3038	19.8461	19.3141	18.8871	(93)
Temperature adjustment												0.0000	
adjusted MIT	18.9045	19.0770	19.3813	19.8056	20.1731	20.3968	20.4520	20.4457	20.3038	19.8461	19.3141	18.8871	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Useful gains	335.0267	370.9011	402.2169	426.2802	414.2320	330.3791	233.9947	242.0407	319.6660	335.9977	322.3532	319.6869	(94)
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	945.5275	914.7576	828.3960	690.3774	534.7982	360.8026	239.7557	251.1557	388.2245	583.5862	775.5627	938.4354	(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	454.2126	365.4715	317.0773	190.1500	89.7013	0.0000	0.0000	0.0000	0.0000	184.2058	326.3108	460.3489	(98)
Space heating												2387.4782	(98)
Space heating per m2												46.2242	(99)

8c. Space cooling requirement

Not applicable

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Built)

CALCULATION OF TARGET EMISSIONS 09 Jan 2014

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 %)												93.4000 (206)
Efficiency of secondary/supplementary heating system, %												0.0000 (208)
Space heating requirement												2556.1865 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	454.2126	365.4715	317.0773	190.1500	89.7013	0.0000	0.0000	0.0000	0.0000	184.2058	326.3108	460.3489 (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)	486.3090	391.2972	339.4832	203.5867	96.0399	0.0000	0.0000	0.0000	0.0000	197.2225	349.3692	492.8789 (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	165.4716	144.5437	150.3884	133.3869	129.1420	113.7411	108.9726	121.4790	122.8206	139.8557	149.2932	161.5857 (64)
Efficiency of water heater (217)m	87.4625	87.2884	86.8843	85.9434	84.1538	80.3000	80.3000	80.3000	80.3000	85.7455	86.9664	80.3000 (216)
Fuel for water heating, kWh/month	189.1915	165.5932	173.0904	155.2033	153.4595	141.6452	135.7069	151.2814	152.9521	163.1055	171.6677	184.5864 (219)
Water heating fuel used												1937.4831 (219)
Annual totals kWh/year												
Space heating fuel - main system												2556.1865 (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)												254.5148 (232)
Total delivered energy for all uses												4823.1843 (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	2556.1865	0.2160	552.1363 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1937.4831	0.2160	418.4963 (264)
Space and water heating			970.6326 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	254.5148	0.5190	132.0932 (268)
Total CO2, kg/m2/year			1141.6508 (272)
Emissions per m2 for space and water heating			18.7925 (272a)
Fuel factor (mains gas)			1.0000
Emissions per m2 for lighting			2.5575 (272b)
Emissions per m2 for pumps and fans			0.7536 (272c)
Target Carbon Dioxide Emission Rate (TER) = (18.7925 * 1.00) + 2.5575 + 0.7536, rounded to 2 d.p.			22.1000 (273)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

Property Reference	074 - PRJ013014	Issued on Date	27/05/2025
Assessment Reference	074	Prop Type Ref	1BFA
Property	Flat 2, Hawker House, Paulet Close, Netley Abbey, SOUTHAMPTON, SO31 5JW		
SAP Rating	81 B	DER	6.14
Environmental	97 A	TER	22.10
CO ₂ Emissions (t/year)	0.02	% DER<TER	72.22
General Requirements Compliance	Pass	DFEE	58.03
		TFEE	59.52
		% DFEE<TFEE	2.51
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)	22.10	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	6.14	kgCO ₂ /m ²	Pass
	-15.96 (-72.2%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	59.52	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	58.03	kWh/m ² /yr	
	-1.5 (-2.5%)	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	0.20 (max. 0.25)	0.20 (max. 0.70)	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	3.99 (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
Secondary heating system	None	

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Built)

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 North East

3.64 m², No overhang

Windows facing South East

3.06 m², No overhang

Windows facing North West

0.72 m², No overhang

Air change rate

5.28 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

3.99 (measured in this dwelling)

Maximum

10.0

Pass

10 Key features

Air permeability

4.0

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.