

PREDICTED ENERGY ASSESSMENT

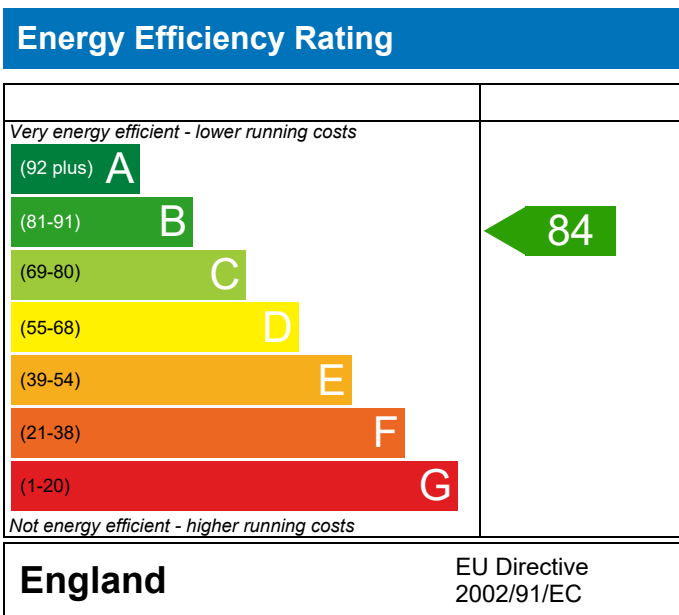


125 - PRJ011855

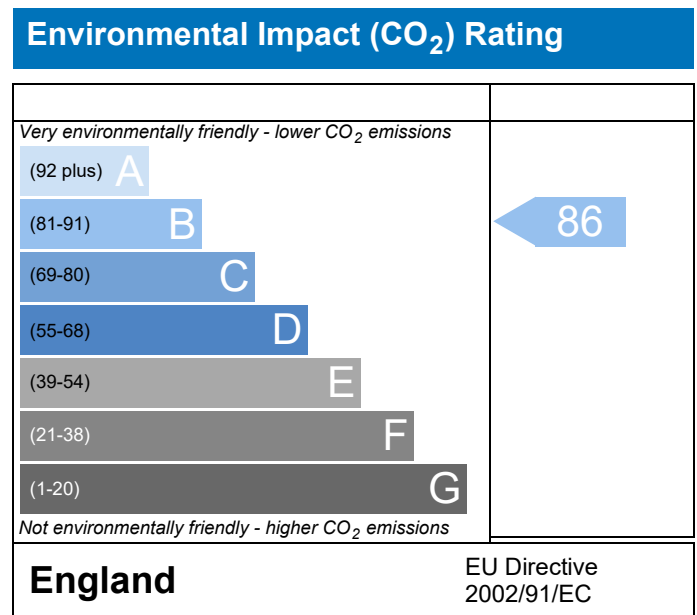
Dwelling type: House, End-Terrace
 Date of assessment: 02/08/2021
 Produced by: Michael Juckes
 Total floor area: 82.22 m²

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

The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO₂) emissions.



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



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

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

BUILDING REGULATION COMPLIANCE

Calculation Type: New Build (As Designed)



Property Reference	125 - PRJ011855		Issued on Date	02/08/2021	
Assessment Reference	125 E	Prop Type Ref	BLO-0297 STO BR-ET 4.1		
Property	125 - PRJ011855				
SAP Rating	84 B	DER	17.63	TER	18.85
Environmental	86 B	% DER<TER	6.48		
CO ₂ Emissions (t/year)	1.25	DFEE	45.82	TFEE	54.54
General Requirements Compliance	Pass	% DFEE<TFEE	16.00		
Assessor Details	Mr. Michael Juckes, Michael Juckes, Tel: 02033971373, michael@briaryenergy.co.uk			Assessor ID	T850-0001
Client					

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

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)	18.85	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	17.63	kgCO ₂ /m ²	Pass
	-1.22 (-6.5%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	54.54	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	45.82	kWh/m ² /yr	
	-8.7 (-16.0%)	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)	0.24 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.22 (max. 0.25)	0.22 (max. 0.70)	Pass
Roof	0.10 (max. 0.20)	0.10 (max. 0.35)	Pass
Openings	1.28 (max. 2.00)	1.30 (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	5.01 (design value)	m ³ /(h.m ²) @ 50 Pa	
Maximum	10.0	m ³ /(h.m ²) @ 50 Pa	Pass

Limiting System Efficiencies

4 Heating efficiency

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BUILDING REGULATION COMPLIANCE

Calculation Type: New Build (As Designed)



Main heating system

Boiler system with radiators or underfloor - Mains gas
Data from database
Ideal LOGIC COMBI ESP1 30
Combi boiler
Efficiency: 89.6% SEDBUK2009
Minimum: 88.0%

Pass

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 (East Anglia)

Slight

Pass

Based on:

Overshading

Average

Windows facing North East

2.70 m², No overhang

Windows facing South West

3.06 m², No overhang

Windows facing North West

6.63 m², No overhang

Air change rate

4.21 ach

Blinds/curtains

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

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type

U-value

Filled Cavity with Edge Sealing

0.00 W/m²K

Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

5.01 (design value) m³/(h.m²) @ 50 Pa

Maximum

10.0 m³/(h.m²) @ 50 Pa

Pass

10 Key features

Party wall U-value

0.00 W/m²K

Roof U-value

0.10 W/m²K

Thermal bridging y-value

0.030 W/m²K

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FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



Property Reference	125 - PRJ011855	Issued on Date	02/08/2021
Assessment Reference	125 E	Prop Type Ref	BLO-0297 STO BR-ET 4.1
Property	125 - PRJ011855		

SAP Rating	84 B	DER	17.63	TER	18.85
Environmental	86 B	% DER<TER	6.48		
CO ₂ Emissions (t/year)	1.25	DFEE	45.82	TTEE	54.54
General Requirements Compliance	Pass	% DFEE<TTEE	16.00		

Assessor Details	Mr. Michael Juckes, Michael Juckes, Tel: 02033971373, michael@briaryenergy.co.uk	Assessor ID	T850-0001
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Client	
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CALCULATION OF HEAT DEMAND 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)
 CALCULATION OF HEAT DEMAND 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	41.1100 (1b)	x 2.3300 (2b)	= 95.7863 (1b) - (3b)
First floor	41.1100 (1c)	x 2.5300 (2c)	= 104.0083 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	82.2200		(4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 199.7946 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour							
Number of chimneys	0	0	0	0 + 40 =	0.0000 (6a)							
Number of open flues	0	0	0	0 + 20 =	0.0000 (6b)							
Number of intermittent fans				3 * 10 =	30.0000 (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)				30.0000 / (5) =	0.1502 (8)							
Pressure test				Yes								
Measured/design AP50					5.0100							
Infiltration rate					0.4007 (18)							
Number of sides sheltered					1 (19)							
Shelter factor				(20) = 1 - [0.075 x (19)] =	0.9250 (20)							
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.3706 (21)							
Wind speed	Jan 4.9000	Feb 4.8000	Mar 4.7000	Apr 4.2000	May 4.2000	Jun 3.7000	Jul 3.8000	Aug 3.8000	Sep 4.0000	Oct 4.2000	Nov 4.3000	Dec 4.5000 (22)
Wind factor	1.2250	1.2000	1.1750	1.0500	1.0500	0.9250	0.9500	0.9500	1.0000	1.0500	1.0750	1.1250 (22a)
Adj infiltr rate	0.4540	0.4447	0.4355	0.3891	0.3891	0.3428	0.3521	0.3521	0.3706	0.3891	0.3984	0.4169 (22b)
Effective ac	0.6031	0.5989	0.5948	0.5757	0.5757	0.5588	0.5620	0.5620	0.5687	0.5757	0.5794	0.5869 (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
Windows (Uw = 1.30)			12.3900	1.2357	15.3108		(27)
Solid Door			4.0600	1.2000	4.8720		(26)
Flr - Ground			41.1060	0.2200	9.0433	75.6000	3107.6136 (28a)
Wl - Brick	89.3440	16.4510	72.8930	0.2400	17.4943	38.9400	2838.4534 (29a)
Rf - Ins Joist	41.1060		41.1060	0.1000	4.1106	5.8200	239.2369 (30)
Total net area of external elements Aum(A, m ²)			171.5550				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	50.8311	(33)
Party Wall			40.9400	0.0000	0.0000	54.0300	2211.9882 (32)
Ground Floor Stud			70.1568			5.8200	408.3126 (32c)
1st Floor Stud			102.8297			5.8200	598.4690 (32c)
Internal Floor			41.1000			18.0000	739.8000 (32d)
Internal Ceiling			41.1000			5.8200	239.2020 (32e)
Heat capacity Cm = Sum (A x k)					(28)...(30) + (32) + (32a)...(32e) =	10383.0758 (34)	
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							126.2841 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							5.1982 (36)
Total fabric heat loss					(33) + (36) =	56.0293 (37)	

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF HEAT DEMAND 09 Jan 2014

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	39.7607	39.4862	39.2174	37.9580	37.9580	36.8402	37.0525	37.0525	37.4939	37.9580	38.1986	38.6966 (38)
Heat transfer coeff	95.7900	95.5155	95.2466	93.9873	93.9873	92.8695	93.0818	93.0818	93.5232	93.9873	94.2279	94.7259 (39)
Average = Sum(39)m / 12 =												94.1687 (39)
HLP	1.1650	1.1617	1.1584	1.1431	1.1431	1.1295	1.1321	1.1321	1.1375	1.1431	1.1460	1.1521 (40)
HLP (average)												1.1453 (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 2.5036 (42)

Average daily hot water use (litres/day) 93.6613 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	103.0275	99.2810	95.5346	91.7881	88.0417	84.2952	84.2952	88.0417	91.7881	95.5346	99.2810	103.0275 (44)
Energy conte	152.7868	133.6283	137.8924	120.2179	115.3520	99.5400	92.2384	105.8449	107.1091	124.8253	136.2566	147.9658 (45)
Energy content (annual)												Total = Sum(45)m = 1473.6575 (45)
Distribution loss (46)m = 0.15 x (45)m	22.9180	20.0442	20.6839	18.0327	17.3028	14.9310	13.8358	15.8767	16.0664	18.7238	20.4385	22.1949 (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												
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 (57)
Combi loss	14.6753	13.2391	14.6121	14.0893	14.5216	14.0100	14.4502	14.4965	14.0532	14.5747	14.1641	14.6608 (61)
Total heat required for water heating calculated for each month	167.4620	146.8674	152.5045	134.3073	129.8736	113.5500	106.6886	120.3414	121.1623	139.4000	150.4207	162.6266 (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)
Solar input (sum of months) = Sum(63)m =												0.0000 (63)
Output from w/h	167.4620	146.8674	152.5045	134.3073	129.8736	113.5500	106.6886	120.3414	121.1623	139.4000	150.4207	162.6266 (64)
Total per year (kWh/year) = Sum(64)m =												1645.2043 (64)
RHI water heating demand												1645 (64)
Heat gains from water heating, kWh/month	54.4704	47.7412	49.5023	43.4948	41.9849	36.5996	34.2818	38.8176	39.1271	45.1481	48.8463	52.8638 (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	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	52.7264	46.8311	38.0856	28.8333	21.5532	18.1961	19.6616	25.5568	34.3023	43.5547	50.8348	54.1918 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	334.3547	337.8243	329.0811	310.4679	286.9721	264.8894	250.1368	246.6672	255.4104	274.0236	297.5194	319.6021 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254 (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)	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454 (71)
Water heating gains (Table 5)	73.2129	71.0434	66.5353	60.4094	56.4314	50.8327	46.0777	52.1741	54.3432	60.6829	67.8421	71.0535 (72)
Total internal gains	565.8922	561.2969	539.3001	505.3088	470.5548	439.5164	421.4742	429.9964	449.6540	483.8593	521.7944	550.4456 (73)

6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	Specific data or Table 6b g	Specific data or Table 6c FF	Access factor Table 6d	Gains W						
Northeast	2.7000	12.9465	0.4700	0.0000	0.7700	12.6504 (75)						
Southwest	3.0600	40.9830	0.4700	0.0000	0.7700	45.3852 (79)						
Northwest	6.6320	12.9465	0.4700	0.0000	0.7700	31.0733 (81)						
Solar gains	89.1089	155.2523	244.5523	380.7267	506.4180	473.3181	397.1350	301.9270	189.5895	112.1103	73.7900 (83)	
Total gains	655.0010	716.5493	783.8525	886.0355	936.2627	945.9344	894.7923	827.1313	751.5811	673.4488	633.9047	624.2356 (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	30.1095	30.1960	30.2813	30.6870	30.6870	31.0563	30.9855	30.9855	30.8393	30.6870	30.6086	30.4477
alpha	3.0073	3.0131	3.0188	3.0458	3.0458	3.0704	3.0657	3.0657	3.0560	3.0458	3.0406	3.0298
util living area	0.9561	0.9414	0.9060	0.8219	0.6903	0.5066	0.3441	0.3699	0.6351	0.8500	0.9336	0.9607 (86)
MIT	19.2533	19.4395	19.8335	20.3371	20.7131	20.9228	20.9838	20.9802	20.8421	20.3799	19.7575	19.2293 (87)
Th 2	19.9481	19.9508	19.9534	19.9658	19.9658	19.9768	19.9747	19.9747	19.9703	19.9658	19.9634	19.9585 (88)
util rest of house	0.9485	0.9314	0.8894	0.7907	0.6362	0.4273	0.2445	0.2638	0.5551	0.8155	0.9202	0.9538 (89)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF HEAT DEMAND 09 Jan 2014

MIT 2	18.3803	18.5643	18.9491	19.4335	19.7664	19.9374	19.9704	19.9693	19.8806	19.4846	18.8885	18.3647 (90)
Living area fraction									fLA = Living area / (4) =			0.2147 (91)
MIT	18.5677	18.7522	19.1390	19.6275	19.9696	20.1489	20.1879	20.1863	20.0870	19.6768	19.0750	18.5503 (92)
Temperature adjustment												-0.1500
adjusted MIT	18.4177	18.6022	18.9890	19.4775	19.8196	19.9989	20.0379	20.0363	19.9370	19.5268	18.9250	18.4003 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9342	0.9151	0.8708	0.7738	0.6278	0.4291	0.2508	0.2704	0.5523	0.7980	0.9033	0.9404 (94)
Useful gains	611.8704	655.7134	682.5859	685.5748	587.7961	405.8775	224.3920	223.6460	415.0852	537.4230	572.6076	587.0106 (95)
Ext temp.	4.7000	5.2000	7.0000	9.5000	12.5000	15.4000	17.6000	17.6000	15.0000	11.4000	7.7000	4.7000 (96)
Heat loss rate W												
1314.0154	1280.1137	1141.9087	937.7569	687.9500	427.0999	226.9261	226.7782	461.7276	763.8176	1057.7115	1297.7748 (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	522.3959	419.5970	341.7361	181.5711	74.5145	0.0000	0.0000	0.0000	0.0000	168.4375	349.2748	528.8086 (98)
Space heating												2586.3356 (98)
RHI space heating demand												2586 (98)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF ENERGY RATINGS 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)
 CALCULATION OF ENERGY RATINGS 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	41.1100 (1b)	x 2.3300 (2b)	= 95.7863 (1b) - (3b)
First floor	41.1100 (1c)	x 2.5300 (2c)	= 104.0083 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	82.2200		(4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 199.7946 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour							
Number of chimneys	0	0	0	0 * 40 =	0.0000 (6a)							
Number of open flues	0	0	0	0 * 20 =	0.0000 (6b)							
Number of intermittent fans				3 * 10 =	30.0000 (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) =				30.0000 / (5) =	0.1502 (8)							
Pressure test				Yes								
Measured/design AP50					5.0100							
Infiltration rate					0.4007 (18)							
Number of sides sheltered					1 (19)							
Shelter factor			(20) = 1 - [0.075 x (19)] =		0.9250 (20)							
Infiltration rate adjusted to include shelter factor			(21) = (18) x (20) =		0.3706 (21)							
Wind speed	Jan 5.1000	Feb 5.0000	Mar 4.9000	Apr 4.4000	May 4.3000	Jun 3.8000	Jul 3.8000	Aug 3.7000	Sep 4.0000	Oct 4.3000	Nov 4.5000	Dec 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	0.4725	0.4633	0.4540	0.4077	0.3984	0.3521	0.3521	0.3428	0.3706	0.3984	0.4169	0.4355 (22b)
Effective ac	0.6116	0.6073	0.6031	0.5831	0.5794	0.5620	0.5620	0.5588	0.5687	0.5794	0.5869	0.5948 (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
Windows (Uw = 1.30)			12.3900	1.2357	15.3108		(27)
Solid Door			4.0600	1.2000	4.8720		(26)
Flr - Ground			41.1060	0.2200	9.0433	75.6000	3107.6136 (28a)
Wl - Brick	89.3440	16.4510	72.8930	0.2400	17.4943	38.9400	2838.4534 (29a)
RF - Ins Joist	41.1060		41.1060	0.1000	4.1106	5.8200	239.2369 (30)
Total net area of external elements Aum(A, m ²)			171.5550				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	50.8311		(33)
Party Wall			40.9400	0.0000	0.0000	54.0300	2211.9882 (32)
Ground Floor Stud			70.1568			5.8200	408.3126 (32c)
1st Floor Stud			102.8297			5.8200	598.4690 (32c)
Internal Floor			41.1000			18.0000	739.8000 (32d)
Internal Ceiling			41.1000			5.8200	239.2020 (32e)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 10383.0758 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							126.2841 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							5.1982 (36)
Total fabric heat loss							(33) + (36) = 56.0293 (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	40.3267	40.0409	39.7607	38.4448	38.1986	37.0525	37.0525	36.8402	37.4939	38.1986	38.6966	39.2174 (38)
Average = Sum(39)m / 12 =	96.3560	96.0701	95.7900	94.4741	94.2279	93.0818	93.0818	92.8695	93.5232	94.2279	94.7259	95.2466 (39)
HLP	1.1719	1.1685	1.1650	1.1490	1.1460	1.1321	1.1321	1.1295	1.1375	1.1460	1.1521	1.1584 (40)
HLP (average)												1.1490 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Assumed occupancy												2.5036 (42)
Average daily hot water use (litres/day)												93.6613 (43)
Daily hot water use	103.0275	99.2810	95.5346	91.7881	88.0417	84.2952	84.2952	88.0417	91.7881	95.5346	99.2810	103.0275 (44)
Energy conte	152.7868	133.6283	137.8924	120.2179	115.3520	99.5400	92.2384	105.8449	107.1091	124.8253	136.2566	147.9658 (45)
Energy content (annual)										Total = Sum(45)m =		1473.6575 (45)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF ENERGY RATINGS 09 Jan 2014

Distribution loss (46)m = 0.15 x (45)m	22.9180	20.0442	20.6839	18.0327	17.3028	14.9310	13.8358	15.8767	16.0664	18.7238	20.4385	22.1949 (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	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	14.6753	13.2391	14.6121	14.0893	14.5216	14.0100	14.4502	14.4965	14.0532	14.5747	14.1641	14.6608 (61)
Total heat required for water heating calculated for each month	167.4620	146.8674	152.5045	134.3073	129.8736	113.5500	106.6886	120.3414	121.1623	139.4000	150.4207	162.6266 (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	167.4620	146.8674	152.5045	134.3073	129.8736	113.5500	106.6886	120.3414	121.1623	139.4000	150.4207	162.6266 (64)
Heat gains from water heating, kWh/month	54.4704	47.7412	49.5023	43.4948	41.9849	36.5996	34.2818	38.8176	39.1271	45.1481	48.8463	52.8638 (65)
												Total per year (kWh/year) = Sum(64)m = 1645.2043 (64)

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	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	52.7264	46.8311	38.0856	28.8333	21.5532	18.1961	19.6616	25.5568	34.3023	43.5547	50.8348	54.1918 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	334.3547	337.8243	329.0811	310.4679	286.9721	264.8894	250.1368	246.6672	255.4104	274.0236	297.5194	319.6021 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254 (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)	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454 (71)
Water heating gains (Table 5)	73.2129	71.0434	66.5353	60.4094	56.4314	50.8327	46.0777	52.1741	54.3432	60.6829	67.8421	71.0535 (72)
Total internal gains	565.8922	561.2969	539.3001	505.3088	470.5548	439.5164	421.4742	429.9964	449.6540	483.8593	521.7944	550.4456 (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	2.7000	11.2829	0.4700	0.0000	0.7700	11.0249 (75)						
Southwest	3.0600	36.7938	0.4700	0.0000	0.7700	40.7460 (79)						
Northwest	6.6320	11.2829	0.4700	0.0000	0.7700	27.0804 (81)						
Solar gains	78.8513	146.9700	234.7102	347.1685	440.2925	459.7330	433.8164	360.8829	273.1089	171.4978	96.7507	65.9888 (83)
Total gains	644.7435	708.2669	774.0103	852.4773	910.8473	899.2493	855.2906	790.8792	722.7629	655.3571	618.5451	616.4344 (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	29.9326	30.0217	30.1095	30.5289	30.6086	30.9855	30.9855	31.0563	30.8393	30.6086	30.4477	30.2813	
alpha	2.9955	3.0014	3.0073	3.0353	3.0406	3.0657	3.0657	3.0704	3.0560	3.0406	3.0298	3.0188	
util living area	0.9603	0.9456	0.9156	0.8496	0.7378	0.5846	0.4514	0.4993	0.7092	0.8787	0.9436	0.9647 (86)	
MIT	19.1546	19.3636	19.7294	20.2139	20.6162	20.8679	20.9557	20.9391	20.7501	20.2408	19.6255	19.1182 (87)	
Th 2	19.9425	19.9453	19.9481	19.9610	19.9634	19.9747	19.9747	19.9768	19.9703	19.9634	19.9585	19.9534 (88)	
util rest of house	0.9535	0.9364	0.9009	0.8228	0.6908	0.5113	0.3563	0.4025	0.6424	0.8511	0.9324	0.9587 (89)	
MIT 2	18.2789	18.4858	18.8443	19.3161	19.6826	19.8983	19.9570	19.9507	19.8107	19.3537	18.7560	18.2512 (90)	
Living area fraction									fLA = Living area / (4) =			0.2147 (91)	
MIT	18.4669	18.6742	19.0343	19.5089	19.8830	20.1064	20.1714	20.1629	20.0124	19.5442	18.9427	18.4373 (92)	
Temperature adjustment												-0.1500	
adjusted MIT	18.3169	18.5242	18.8843	19.3589	19.7330	19.9564	20.0214	20.0129	19.8624	19.3942	18.7927	18.2873 (93)	

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	0.9398	0.9205	0.8826	0.8046	0.6791	0.5099	0.3608	0.4061	0.6345	0.8327	0.9164	0.9460 (94)
Useful gains	605.9433	651.9950	683.1034	685.9438	618.5953	458.5193	308.6206	321.2012	458.5904	545.7156	566.8567	583.1273 (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	1350.6070	1308.8810	1186.2934	988.0908	756.9360	498.5860	318.4686	335.5240	538.9171	828.6566	1107.6006	1341.7719 (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	554.0298	441.4274	374.3733	217.5458	102.9255	0.0000	0.0000	0.0000	0.0000	210.5081	389.3356	564.4316 (98)
Space heating												2854.5771 (98)
Space heating per m2												(98) / (4) = 34.7188 (99)

8c. Space cooling requirement

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF ENERGY RATINGS 09 Jan 2014

Not applicable

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 %)													90.5000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													3154.2289 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	554.0298	441.4274	374.3733	217.5458	102.9255	0.0000	0.0000	0.0000	0.0000	210.5081	389.3356	564.4316	(98)
Space heating efficiency (main heating system 1)	90.5000	90.5000	90.5000	90.5000	90.5000	0.0000	0.0000	0.0000	0.0000	90.5000	90.5000	90.5000	(210)
Space heating fuel (main heating system)	612.1876	487.7650	413.6722	240.3821	113.7298	0.0000	0.0000	0.0000	0.0000	232.6056	430.2050	623.6814	(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	167.4620	146.8674	152.5045	134.3073	129.8736	113.5500	106.6886	120.3414	121.1623	139.4000	150.4207	162.6266	(64)
Efficiency of water heater (217)m	89.7365	89.6793	89.5499	89.2512	88.6864	87.3000	87.3000	87.3000	87.3000	89.1974	89.5849	87.3000	(216)
Fuel for water heating, kWh/month	186.6152	163.7694	170.3012	150.4823	146.4413	130.0687	122.2092	137.8481	138.7884	156.2825	167.9086	181.1713	(219)
Water heating fuel used													1851.8862 (219)
Annual totals kWh/year													
Space heating fuel - main system													3154.2289 (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)													372.4659 (232)
Total delivered energy for all uses													5453.5809 (238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	3154.2289	3.4800	109.7672 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1851.8862	3.4800	64.4456 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	372.4659	13.1900	49.1283 (250)
Additional standing charges			120.0000 (251)
Total energy cost			353.2336 (255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):		0.4200 (256)
Energy cost factor (ECF)	[(255) x (256)] / [(4) + 45.0] =	1.1662 (257)
SAP value		83.7322
SAP rating (Section 12)		84 (258)
SAP band		B

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	3154.2289	0.2160	681.3134 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1851.8862	0.2160	400.0074 (264)
Space and water heating			1081.3208 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	372.4659	0.5190	193.3098 (268)
Total kg/year			1313.5556 (272)
CO2 emissions per m2			15.9800 (273)
EI value			86.1644
EI rating			86 (274)
EI band			B

Calculation of stars for heating and DHW

Main heating energy efficiency	$3.48 \times (1 + 0.29 \times 0.00) / 0.9050 = 3.845$, stars = 4
Main heating environmental impact	$0.216 \times (1 + 0.29 \times 0.00) / 0.9050 = 0.2387$, stars = 4
Water heating energy efficiency	$3.48 / 0.8872 = 3.922$, stars = 4
Water heating environmental impact	$0.216 / 0.8872 = 0.2435$, stars = 4

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CALCULATION OF ENERGY RATINGS 09 Jan 2014

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)
 CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	41.1100 (1b)	x 2.3300 (2b)	= 95.7863 (1b) - (3b)
First floor	41.1100 (1c)	x 2.5300 (2c)	= 104.0083 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	82.2200		(4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 199.7946 (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					3 * 10 = 30.0000 (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) =					30.0000 / (5) = 0.1502 (8)
Pressure test					Yes
Measured/design AP50					5.0100
Infiltration rate					0.4007 (18)
Number of sides sheltered					1 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	0.9250 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.3706 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	4.9000	4.8000	4.7000	4.2000	4.2000	3.7000	3.8000	3.8000	4.0000	4.2000	4.3000	4.5000 (22)
Wind factor	1.2250	1.2000	1.1750	1.0500	1.0500	0.9250	0.9500	0.9500	1.0000	1.0500	1.0750	1.1250 (22a)
Adj inflt rate												
Effective ac	0.4540	0.4447	0.4355	0.3891	0.3891	0.3428	0.3521	0.3521	0.3706	0.3891	0.3984	0.4169 (22b)
	0.6031	0.5989	0.5948	0.5757	0.5757	0.5588	0.5620	0.5620	0.5687	0.5757	0.5794	0.5869 (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
Windows (Uw = 1.30)			12.3900	1.2357	15.3108		(27)
Solid Door			4.0600	1.2000	4.8720		(26)
Flr - Ground			41.1060	0.2200	9.0433	75.6000	3107.6136 (28a)
Wl - Brick	89.3440	16.4510	72.8930	0.2400	17.4943	38.9400	2838.4534 (29a)
RF - Ins Joist	41.1060		41.1060	0.1000	4.1106	5.8200	239.2369 (30)
Total net area of external elements Aum(A, m ²)			171.5550				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	50.8311		(33)
Party Wall			40.9400	0.0000	0.0000	54.0300	2211.9882 (32)
Ground Floor Stud			70.1568			5.8200	408.3126 (32c)
1st Floor Stud			102.8297			5.8200	598.4690 (32c)
Internal Floor			41.1000			18.0000	739.8000 (32d)
Internal Ceiling			41.1000			5.8200	239.2020 (32e)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	10383.0758 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							126.2841 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							5.1982 (36)
Total fabric heat loss						(33) + (36) =	56.0293 (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	39.7607	39.4862	39.2174	37.9580	37.9580	36.8402	37.0525	37.0525	37.4939	37.9580	38.1986	38.6966 (38)
Heat transfer coeff	95.7900	95.5155	95.2466	93.9873	93.9873	92.8695	93.0818	93.0818	93.5232	93.9873	94.2279	94.7259 (39)
Average = Sum(39)m / 12 =												94.1687 (39)
HLP	1.1650	1.1617	1.1584	1.1431	1.1431	1.1295	1.1321	1.1321	1.1375	1.1431	1.1460	1.1521 (40)
HLP (average)												1.1453 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Assumed occupancy												2.5036 (42)
Average daily hot water use (litres/day)												93.6613 (43)
Daily hot water use	103.0275	99.2810	95.5346	91.7881	88.0417	84.2952	84.2952	88.0417	91.7881	95.5346	99.2810	103.0275 (44)
Energy conte	152.7868	133.6283	137.8924	120.2179	115.3520	99.5400	92.2384	105.8449	107.1091	124.8253	136.2566	147.9658 (45)
Energy content (annual)										Total = Sum(45)m =		1473.6575 (45)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

Distribution loss (46)m = 0.15 x (45)m	22.9180	20.0442	20.6839	18.0327	17.3028	14.9310	13.8358	15.8767	16.0664	18.7238	20.4385	22.1949 (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	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	14.6753	13.2391	14.6121	14.0893	14.5216	14.0100	14.4502	14.4965	14.0532	14.5747	14.1641	14.6608 (61)
Total heat required for water heating calculated for each month	167.4620	146.8674	152.5045	134.3073	129.8736	113.5500	106.6886	120.3414	121.1623	139.4000	150.4207	162.6266 (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	167.4620	146.8674	152.5045	134.3073	129.8736	113.5500	106.6886	120.3414	121.1623	139.4000	150.4207	162.6266 (64)
Heat gains from water heating, kWh/month	54.4704	47.7412	49.5023	43.4948	41.9849	36.5996	34.2818	38.8176	39.1271	45.1481	48.8463	52.8638 (65)
												Total per year (kWh/year) = Sum(64)m = 1645.2043 (64)

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	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	52.7264	46.8311	38.0856	28.8333	21.5532	18.1961	19.6616	25.5568	34.3023	43.5547	50.8348	54.1918 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	334.3547	337.8243	329.0811	310.4679	286.9721	264.8894	250.1368	246.6672	255.4104	274.0236	297.5194	319.6021 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254 (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)	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454 (71)
Water heating gains (Table 5)	73.2129	71.0434	66.5353	60.4094	56.4314	50.8327	46.0777	52.1741	54.3432	60.6829	67.8421	71.0535 (72)
Total internal gains	565.8922	561.2969	539.3001	505.3088	470.5548	439.5164	421.4742	429.9964	449.6540	483.8593	521.7944	550.4456 (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	2.7000	12.9465	0.4700	0.0000	0.7700	12.6504 (75)						
Southwest	3.0600	40.9830	0.4700	0.0000	0.7700	45.3852 (79)						
Northwest	6.6320	12.9465	0.4700	0.0000	0.7700	31.0733 (81)						
Solar gains	89.1089	155.2523	244.5523	380.7267	465.7079	506.4180	473.3181	397.1350	301.9270	189.5895	112.1103	73.7900 (83)
Total gains	655.0010	716.5493	783.8525	886.0355	936.2627	945.9344	894.7923	827.1313	751.5811	673.4488	633.9047	624.2356 (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	30.1095	30.1960	30.2813	30.6870	30.6870	31.0563	30.9855	30.9855	30.8393	30.6870	30.6086	30.4477
alpha	3.0073	3.0131	3.0188	3.0458	3.0458	3.0704	3.0657	3.0657	3.0560	3.0458	3.0406	3.0298
util living area	0.9561	0.9414	0.9060	0.8219	0.6903	0.5066	0.3441	0.3699	0.6351	0.8500	0.9336	0.9607 (86)
MIT	19.2533	19.4395	19.8335	20.3371	20.7131	20.9228	20.9838	20.9802	20.8421	20.3799	19.7575	19.2293 (87)
Th 2	19.9481	19.9508	19.9534	19.9658	19.9658	19.9768	19.9747	19.9747	19.9703	19.9658	19.9634	19.9585 (88)
util rest of house	0.9485	0.9314	0.8894	0.7907	0.6362	0.4273	0.2445	0.2638	0.5551	0.8155	0.9202	0.9538 (89)
MIT 2	18.3803	18.5643	18.9491	19.4335	19.7664	19.9374	19.9704	19.9693	19.8806	19.4846	18.8885	18.3647 (90)
Living area fraction												0.2147 (91)
MIT	18.5677	18.7522	19.1390	19.6275	19.9696	20.1489	20.1879	20.1863	20.0870	19.6768	19.0750	18.5503 (92)
Temperature adjustment												-0.1500
adjusted MIT	18.4177	18.6022	18.9890	19.4775	19.8196	19.9989	20.0379	20.0363	19.9370	19.5268	18.9250	18.4003 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	0.9342	0.9151	0.8708	0.7738	0.6278	0.4291	0.2508	0.2704	0.5523	0.7980	0.9033	0.9404 (94)
Useful gains	611.8704	655.7134	682.5859	685.5748	587.7961	405.8775	224.3920	223.6460	415.0852	537.4230	572.6076	587.0106 (95)
Ext temp.	4.7000	5.2000	7.0000	9.5000	12.5000	15.4000	17.6000	17.6000	15.0000	11.4000	7.7000	4.7000 (96)
Heat loss rate W	1314.0154	1280.1137	1141.9087	937.7569	687.9500	427.0999	226.9261	226.7782	461.7276	763.8176	1057.7115	1297.7748 (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	522.3959	419.5970	341.7361	181.5711	74.5145	0.0000	0.0000	0.0000	0.0000	168.4375	349.2748	528.8086 (98)
Space heating												2586.3356 (98)
Space heating per m2												(98) / (4) = 31.4563 (99)

8c. Space cooling requirement

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

Not applicable

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
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 %)													90.5000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													2857.8294 (211)
Space heating requirement	522.3959	419.5970	341.7361	181.5711	74.5145	0.0000	0.0000	0.0000	0.0000	168.4375	349.2748	528.8086	(98)
Space heating efficiency (main heating system 1)	90.5000	90.5000	90.5000	90.5000	90.5000	0.0000	0.0000	0.0000	0.0000	90.5000	90.5000	90.5000	(210)
Space heating fuel (main heating system)	577.2330	463.6431	377.6090	200.6311	82.3365	0.0000	0.0000	0.0000	0.0000	186.1188	385.9390	584.3189	(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	167.4620	146.8674	152.5045	134.3073	129.8736	113.5500	106.6886	120.3414	121.1623	139.4000	150.4207	162.6266	(64)
Efficiency of water heater (217)m	89.7018	89.6480	89.4879	89.1112	88.4401	87.3000	87.3000	87.3000	87.3000	89.0223	89.5123	87.3000	(216)
Fuel for water heating, kWh/month	186.6874	163.8267	170.4192	150.7188	146.8492	130.0687	122.2092	137.8481	138.7884	156.5899	168.0447	181.2472	(219)
Water heating fuel used													1853.2975 (219)
Annual totals kWh/year													
Space heating fuel - main system													2857.8294 (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)													372.4659 (232)
Total delivered energy for all uses													5158.5928 (238)

10a. Fuel costs - using BEDF prices (479)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2857.8294	3.7400	106.8828 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1853.2975	3.7400	69.3133 (247)
Pumps and fans for heating	75.0000	19.1200	14.3400 (249)
Energy for lighting	372.4659	19.1200	71.2155 (250)
Additional standing charges			94.0000 (251)
Total energy cost			355.7516 (255)

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	2857.8294	0.2160	617.2912 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1853.2975	0.2160	400.3123 (264)
Space and water heating			1017.6034 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	372.4659	0.5190	193.3098 (268)
Total kg/year			1249.8382 (272)

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	2857.8294	1.2200	3486.5519 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1853.2975	1.2200	2261.0230 (264)
Space and water heating			5747.5749 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	372.4659	3.0700	1143.4703 (268)
Primary energy kWh/year			7121.2952 (272)
Primary energy kWh/m2/year			86.6127 (273)

SAP 2012 EPC IMPROVEMENTS

Current energy efficiency rating: B 84
 Current environmental impact rating: B 86

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

(For testing purposes):

A	Not considered
B	Not considered
C	Not considered
D	Not considered
E Low energy lighting	Already installed
F	Not considered
G	Not considered
H	Not considered
I	Not considered
J	Not considered
K	Not considered
M	Not considered
N Solar water heating	Recommended
O	Not considered
P	Not considered
R	Not considered
S	Not considered
T	Not considered
U Solar photovoltaic panels	Recommended
A2	Not considered
A3	Not considered
T2	Not considered
W	Not considered
X	Not considered
Y	Not considered
J2	Not considered
Q2	Not considered
Z1	Not considered
Z2	Not considered
Z3	Not considered
Z4	Not considered
Z5	Not considered
V2 Wind turbine	Not applicable
L2	Not considered
Q3	Not considered
O3	Not considered

Recommended measures:	SAP change	Cost change	CO2 change
N Solar water heating	+ 1.2	-£ 27	-184 kg (14.8%)
U Solar photovoltaic panels	+ 10.5	-£ 357	-970 kg (91.1%)

Recommended measures	Typical annual savings	Energy efficiency	Environmental impact
Solar water heating	£27	2.24 kg/m ²	B 85 B 88
Solar photovoltaic panels	£357	11.80 kg/m ²	A 95 A 98
Total Savings	£384	14.04 kg/m ²	

Potential energy efficiency rating: A 95
 Potential environmental impact rating: A 98

Fuel prices for cost data on this page from database revision number 479 TEST (30 Jun 2021)
 Recommendation texts revision number 4.9c (22 Feb 2014)

Typical heating and lighting costs of this home (per year, East Anglia):

	Current	Potential	Saving
Electricity	£86	£95	-£10
Mains gas	£270	£234	£36
Space heating	£215	£215	£0
Water heating	£69	£42	£27
Lighting	£71	£71	£0
Generated (PV)	-£0	-£357	£357
Total cost of fuels	£356	-£28	£383
Total cost of uses	£355	-£29	£384
Delivered energy	63 kWh/m ²	29 kWh/m ²	34 kWh/m ²
Carbon dioxide emissions	1.2 tonnes	0.1 tonnes	1.2 tonnes
CO2 emissions per m ²	15 kg/m ²	1 kg/m ²	14 kg/m ²
Primary energy	87 kWh/m ²	4 kWh/m ²	82 kWh/m ²

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)
 CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	41.1100 (1b)	x 2.3300 (2b)	= 95.7863 (1b) - (3b)
First floor	41.1100 (1c)	x 2.5300 (2c)	= 104.0083 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	82.2200		(4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 199.7946 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour							
Number of chimneys	0	0	0	0 * 40 =	0.0000 (6a)							
Number of open flues	0	0	0	0 * 20 =	0.0000 (6b)							
Number of intermittent fans				3 * 10 =	30.0000 (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) =				30.0000 / (5) =	0.1502 (8)							
Pressure test				Yes								
Measured/design AP50				5.0100								
Infiltration rate				0.4007 (18)								
Number of sides sheltered				1 (19)								
Shelter factor			(20) = 1 - [0.075 x (19)] =		0.9250 (20)							
Infiltration rate adjusted to include shelter factor			(21) = (18) x (20) =		0.3706 (21)							
Wind speed	Jan 5.1000	Feb 5.0000	Mar 4.9000	Apr 4.4000	May 4.3000	Jun 3.8000	Jul 3.8000	Aug 3.7000	Sep 4.0000	Oct 4.3000	Nov 4.5000	Dec 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	0.4725	0.4633	0.4540	0.4077	0.3984	0.3521	0.3521	0.3428	0.3706	0.3984	0.4169	0.4355 (22b)
	0.6116	0.6073	0.6031	0.5831	0.5794	0.5620	0.5620	0.5588	0.5687	0.5794	0.5869	0.5948 (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
Windows (Uw = 1.30)			12.3900	1.2357	15.3108		(27)
Solid Door			4.0600	1.2000	4.8720		(26)
Flr - Ground			41.1060	0.2200	9.0433	75.6000	3107.6136 (28a)
Wl - Brick	89.3440	16.4510	72.8930	0.2400	17.4943	38.9400	2838.4534 (29a)
RF - Ins Joist	41.1060		41.1060	0.1000	4.1106	5.8200	239.2369 (30)
Total net area of external elements Aum(A, m ²)			171.5550				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	50.8311		(33)
Party Wall			40.9400	0.0000	0.0000	54.0300	2211.9882 (32)
Ground Floor Stud			70.1568			5.8200	408.3126 (32c)
1st Floor Stud			102.8297			5.8200	598.4690 (32c)
Internal Floor			41.1000			18.0000	739.8000 (32d)
Internal Ceiling			41.1000			5.8200	239.2020 (32e)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 10383.0758 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							126.2841 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							5.1982 (36)
Total fabric heat loss						(33) + (36) =	56.0293 (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	40.3267	40.0409	39.7607	38.4448	38.1986	37.0525	37.0525	36.8402	37.4939	38.1986	38.6966	39.2174 (38)
Average = Sum(39)m / 12 =	96.3560	96.0701	95.7900	94.4741	94.2279	93.0818	93.0818	92.8695	93.5232	94.2279	94.7259	95.2466 (39)
HLP	1.1719	1.1685	1.1650	1.1490	1.1460	1.1321	1.1321	1.1295	1.1375	1.1460	1.1521	1.1584 (40)
HLP (average)												1.1490 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Assumed occupancy												2.5036 (42)
Average daily hot water use (litres/day)												93.6613 (43)
Daily hot water use	103.0275	99.2810	95.5346	91.7881	88.0417	84.2952	84.2952	88.0417	91.7881	95.5346	99.2810	103.0275 (44)
Energy conte	152.7868	133.6283	137.8924	120.2179	115.3520	99.5400	92.2384	105.8449	107.1091	124.8253	136.2566	147.9658 (45)
Energy content (annual)										Total = Sum(45)m =		1473.6575 (45)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

Distribution loss (46)m = 0.15 x (45)m	22.9180	20.0442	20.6839	18.0327	17.3028	14.9310	13.8358	15.8767	16.0664	18.7238	20.4385	22.1949 (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	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	14.6753	13.2391	14.6121	14.0893	14.5216	14.0100	14.4502	14.4965	14.0532	14.5747	14.1641	14.6608 (61)
Total heat required for water heating calculated for each month	167.4620	146.8674	152.5045	134.3073	129.8736	113.5500	106.6886	120.3414	121.1623	139.4000	150.4207	162.6266 (62)
Aperture area of solar collector												3.0000 (H1)
Zero-loss collector efficiency												0.7000 (H2)
Collector heat loss coefficient												1.8000 (H3)
Collector 2nd order heat loss coefficient												0.0050 (H3a)
Collector effective heat loss coefficient												1.8063 (H3b)
Collector performance ratio												2.5804 (H4)
Annual solar radiation per m2												1079.5246 (H5)
Overshading factor												0.8000 (H6)
Solar energy available												1813.6014 (H7)
Adjustment factor for showers												1.0000 (H7a)
Solar-to-load ratio												1.2307 (H8)
Utilisation factor												0.5563 (H9)
Collector performance factor												0.8793 (H10)
Dedicated solar storage volume												75.0000 (H11)
Effective solar volume												75.0000 (H13)
Daily hot water demand												93.6613 (H14)
Volume ratio Veff/V												0.8008 (H15)
Solar storage volume factor												0.9556 (H16)
Solar input												-847.6690 (H17)
Solar input	-24.5807	-41.0181	-69.8586	-93.6243	-115.6649	-113.7170	-112.2142	-98.0421	-76.7866	-52.4362	-29.1563	-20.5699 (63)
Solar input (sum of months) = Sum(63)m =												-847.6690 (63)
Output from w/h	142.8813	105.8492	82.6459	40.6830	14.2086	0.0000	0.0000	22.2993	44.3757	86.9637	121.2644	142.0568 (64)
Total per year (kWh/year) = Sum(64)m =												803.2280 (64)
Heat gains from water heating, kWh/month	54.4704	47.7412	49.5023	43.4948	41.9849	36.5996	34.2818	38.8176	39.1271	45.1481	48.8463	52.8638 (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	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	52.7264	46.8311	38.0856	28.8333	21.5532	18.1961	19.6616	25.5568	34.3023	43.5547	50.8348	54.1918 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	334.3547	337.8243	329.0811	310.4679	286.9721	264.8894	250.1368	246.6672	255.4104	274.0236	297.5194	319.6021 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254 (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)	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454 (71)
Water heating gains (Table 5)	73.2129	71.0434	66.5353	60.4094	56.4314	50.8327	46.0777	52.1741	54.3432	60.6829	67.8421	71.0535 (72)
Total internal gains	565.8922	561.2969	539.3001	505.3088	470.5548	439.5164	421.4742	429.9964	449.6540	483.8593	521.7944	550.4456 (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							
Northeast	2.7000	11.2829	0.4700	0.0000	0.7700	11.0249 (75)						
Southwest	3.0600	36.7938	0.4700	0.0000	0.7700	40.7460 (79)						
Northwest	6.6320	11.2829	0.4700	0.0000	0.7700	27.0804 (81)						
Solar gains	78.8513	146.9700	234.7102	347.1685	440.2925	459.7330	433.8164	360.9829	273.1089	171.4978	96.7507	65.9888 (83)
Total gains	644.7435	708.2669	774.0103	852.4773	910.8473	899.2493	855.2906	790.8792	722.7629	655.3571	618.5451	616.4344 (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	29.9326	30.0217	30.1095	30.5289	30.6086	30.9855	30.9855	31.0563	30.8393	30.6086	30.4477	30.2813	
alpha	2.9955	3.0014	3.0073	3.0353	3.0406	3.0657	3.0657	3.0704	3.0560	3.0406	3.0298	3.0188	
util living area	0.9603	0.9456	0.9156	0.8496	0.7378	0.5846	0.4514	0.4993	0.7092	0.8787	0.9436	0.9647 (86)	
MIT	19.1546	19.3636	19.7294	20.2139	20.6162	20.8679	20.9557	20.9391	20.7501	20.2408	19.6255	19.1182 (87)	
Th 2	19.9425	19.9453	19.9481	19.9610	19.9634	19.9747	19.9747	19.9768	19.9703	19.9634	19.9585	19.9534 (88)	
util rest of house	0.9535	0.9364	0.9009	0.8228	0.6908	0.5113	0.3563	0.4025	0.6424	0.8511	0.9324	0.9587 (89)	
MIT 2	18.2789	18.4858	18.8443	19.3161	19.6826	19.8983	19.9570	19.9507	19.8107	19.3537	18.7560	18.2512 (90)	
Living area fraction													0.2147 (91)
MIT	18.4669	18.6742	19.0343	19.5089	19.8830	20.1064	20.1714	20.1629	20.0124	19.5442	18.9427	18.4373 (92)	
Temperature adjustment													-0.1500
adjusted MIT	18.3169	18.5242	18.8843	19.3589	19.7330	19.9564	20.0214	20.0129	19.8624	19.3942	18.7927	18.2873 (93)	

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9398	0.9205	0.8826	0.8046	0.6791	0.5099	0.3608	0.4061	0.6345	0.8327	0.9164	0.9460	(94)
Useful gains	605.9433	651.9950	683.1034	685.9438	618.5953	458.5193	308.6206	321.2012	458.5904	545.7156	566.8567	583.1273	(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													
	1350.6070	1308.8810	1186.2934	988.0908	756.9360	498.5860	318.4686	335.5240	538.9171	828.6566	1107.6006	1341.7719	(97)
Month fracti	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	(97a)
Space heating kWh													
	554.0298	441.4274	374.3733	217.5458	102.9255	0.0000	0.0000	0.0000	0.0000	210.5081	389.3356	564.4316	(98)
Space heating												2854.5771	(98)
Space heating per m2												(98) / (4) =	34.7188 (99)

8c. Space cooling requirement

Not applicable

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 %)													90.5000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													3154.2289 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	554.0298	441.4274	374.3733	217.5458	102.9255	0.0000	0.0000	0.0000	0.0000	210.5081	389.3356	564.4316	(98)
Space heating efficiency (main heating system 1)	90.5000	90.5000	90.5000	90.5000	90.5000	0.0000	0.0000	0.0000	0.0000	90.5000	90.5000	90.5000	(210)
Space heating fuel (main heating system)	612.1876	487.7650	413.6722	240.3821	113.7298	0.0000	0.0000	0.0000	0.0000	232.6056	430.2050	623.6814	(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													
Water heating requirement	142.8813	105.8492	82.6459	40.6830	14.2086	0.0000	0.0000	22.2993	44.3757	86.9637	121.2644	142.0568	(64)
Efficiency of water heater	89.8250	89.8629	89.9041	89.9804	90.0994	87.3000	87.3000	87.3000	87.3000	89.5405	89.7190	89.8379	(217)
Fuel for water heating, kWh/month	159.0664	117.7896	91.9268	45.2132	15.7700	0.0000	0.0000	25.5433	50.8312	97.1222	135.1603	158.1257	(219)
Water heating fuel used												896.5488	(219)
Annual totals kWh/year													
Space heating fuel - main system													3154.2289 (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)
pump for solar water heating													50.0000 (230g)
Total electricity for the above, kWh/year													125.0000 (231)
Electricity for lighting (calculated in Appendix L)													372.4659 (232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV Unit 0 (0.80 * 2.50 * 1080 * 0.80) =										-1727.2394			-1727.2394 (233)
Total delivered energy for all uses													2821.0041 (238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year	
Space heating - main system 1	3154.2289	3.4800	109.7672	(240)
Space heating - secondary	0.0000	0.0000	0.0000	(242)
Water heating (other fuel)	896.5488	3.4800	31.1999	(247)
Pumps and fans for heating	75.0000	13.1900	9.8925	(249)
Pump for solar water heating	50.0000	13.1900	6.5950	(249)
Energy for lighting	372.4659	13.1900	49.1283	(250)
Additional standing charges			120.0000	(251)
Energy saving/generation technologies				
PV Unit		-1727.2394	13.1900	-227.8229 (252)
Total energy cost			98.7599	(255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):		0.4200 (256)
Energy cost factor (ECF)	[(255) x (256)] / [(4) + 45.0] =	0.3260 (257)
SAP value		95.4517
SAP rating (Section 12)		95 (258)
SAP band		A

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

Energy Emission factor Emissions

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

	kWh/year	kg CO2/kWh	kg CO2/year
Space heating - main system 1	3154.2289	0.2160	681.3134 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	896.5488	0.2160	193.6545 (264)
Space and water heating			874.9680 (265)
Pumps and fans	125.0000	0.5190	64.8750 (267)
Energy for lighting	372.4659	0.5190	193.3098 (268)
Energy saving/generation technologies			
PV Unit	-1727.2394	0.5190	-896.4372 (269)
Total kg/year			236.7155 (272)
CO2 emissions per m2			2.8800 (273)
EI value			97.5067
EI rating			98 (274)
EI band			A

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY FOR IMPROVED DWELLING 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)
 CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY FOR IMPROVED DWELLING 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	41.1100 (1b)	x 2.3300 (2b)	= 95.7863 (1b) - (3b)
First floor	41.1100 (1c)	x 2.5300 (2c)	= 104.0083 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	82.2200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 199.7946 (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					3 * 10 = 30.0000 (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)					30.0000 / (5) = 0.1502 (8)
Pressure test					Yes
Measured/design AP50					5.0100
Infiltration rate					0.4007 (18)
Number of sides sheltered					1 (19)
Shelter factor				(20) = 1 - [0.075 x (19)] =	0.9250 (20)
Infiltration rate adjusted to include shelter factor				(21) = (18) x (20) =	0.3706 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	4.9000	4.8000	4.7000	4.2000	4.2000	3.7000	3.8000	3.8000	4.0000	4.2000	4.3000	4.5000 (22)
Wind factor	1.2250	1.2000	1.1750	1.0500	1.0500	0.9250	0.9500	0.9500	1.0000	1.0500	1.0750	1.1250 (22a)
Adj infilt rate												
Effective ac	0.4540	0.4447	0.4355	0.3891	0.3891	0.3428	0.3521	0.3521	0.3706	0.3891	0.3984	0.4169 (22b)
	0.6031	0.5989	0.5948	0.5757	0.5757	0.5588	0.5620	0.5620	0.5687	0.5757	0.5794	0.5869 (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
Windows (Uw = 1.30)			12.3900	1.2357	15.3108		(27)
Solid Door			4.0600	1.2000	4.8720		(26)
Flr - Ground			41.1060	0.2200	9.0433	75.6000	3107.6136 (28a)
Wl - Brick	89.3440	16.4510	72.8930	0.2400	17.4943	38.9400	2838.4534 (29a)
RF - Ins Joist	41.1060		41.1060	0.1000	4.1106	5.8200	239.2369 (30)
Total net area of external elements Aum(A, m ²)			171.5550				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	50.8311		(33)
Party Wall			40.9400	0.0000	0.0000	54.0300	2211.9882 (32)
Ground Floor Stud			70.1568			5.8200	408.3126 (32c)
1st Floor Stud			102.8297			5.8200	598.4690 (32c)
Internal Floor			41.1000			18.0000	739.8000 (32d)
Internal Ceiling			41.1000			5.8200	239.2020 (32e)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	10383.0758 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							126.2841 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							5.1982 (36)
Total fabric heat loss						(33) + (36) =	56.0293 (37)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	39.7607	39.4862	39.2174	37.9580	37.9580	36.8402	37.0525	37.0525	37.4939	37.9580	38.1986	38.6966 (38)
Heat transfer coeff	95.7900	95.5155	95.2466	93.9873	93.9873	92.8695	93.0818	93.0818	93.5232	93.9873	94.2279	94.7259 (39)
Average = Sum(39)m / 12 =												94.1687 (39)
HLP	1.1650	1.1617	1.1584	1.1431	1.1431	1.1295	1.1321	1.1321	1.1375	1.1431	1.1460	1.1521 (40)
HLP (average)												1.1453 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Assumed occupancy												2.5036 (42)
Average daily hot water use (litres/day)												93.6613 (43)
Daily hot water use	103.0275	99.2810	95.5346	91.7881	88.0417	84.2952	84.2952	88.0417	91.7881	95.5346	99.2810	103.0275 (44)
Energy conte	152.7868	133.6283	137.8924	120.2179	115.3520	99.5400	92.2384	105.8449	107.1091	124.8253	136.2566	147.9658 (45)
Energy content (annual)										Total = Sum(45)m =		1473.6575 (45)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY FOR IMPROVED DWELLING 09 Jan 2014

Distribution loss (46)m = 0.15 x (45)m	22.9180	20.0442	20.6839	18.0327	17.3028	14.9310	13.8358	15.8767	16.0664	18.7238	20.4385	22.1949 (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	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	14.6753	13.2391	14.6121	14.0893	14.5216	14.0100	14.4502	14.4965	14.0532	14.5747	14.1641	14.6608 (61)
Total heat required for water heating calculated for each month	167.4620	146.8674	152.5045	134.3073	129.8736	113.5500	106.6886	120.3414	121.1623	139.4000	150.4207	162.6266 (62)
Aperture area of solar collector												3.0000 (H1)
Zero-loss collector efficiency												0.7000 (H2)
Collector heat loss coefficient												1.8000 (H3)
Collector 2nd order heat loss coefficient												0.0050 (H3a)
Collector effective heat loss coefficient												1.8063 (H3b)
Collector performance ratio												2.5804 (H4)
Annual solar radiation per m2												1168.2835 (H5)
Overshading factor												0.8000 (H6)
Solar energy available												1962.7164 (H7)
Adjustment factor for showers												1.0000 (H7a)
Solar-to-load ratio												1.3319 (H8)
Utilisation factor												0.5280 (H9)
Collector performance factor												0.8793 (H10)
Dedicated solar storage volume												75.0000 (H11)
Effective solar volume												75.0000 (H13)
Daily hot water demand												93.6613 (H14)
Volume ratio Veff/V												0.8008 (H15)
Solar storage volume factor												0.9556 (H16)
Solar input												-870.7683 (H17)
Solar input	-26.3538	-41.0002	-68.6257	-96.5821	-115.0789	-117.8885	-115.1923	-101.4682	-79.9389	-54.7737	-32.0292	-21.8369 (63)
Solar input (sum of months) = Sum(63)m =												-870.7683 (63)
Output from w/h												
	141.1082	105.8671	83.8788	37.7252	14.7947	0.0000	0.0000	18.8732	41.2234	84.6263	118.3915	140.7897 (64)
Total per year (kWh/year) = Sum(64)m =												787.2783 (64)
Heat gains from water heating, kWh/month												
	54.4704	47.7412	49.5023	43.4948	41.9849	36.5996	34.2818	38.8176	39.1271	45.1481	48.8463	52.8638 (65)

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

Metabolic gains (Table 5), Watts												
(66)m	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181	150.2181 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	52.7264	46.8311	38.0856	28.8333	21.5532	18.1961	19.6616	25.5568	34.3023	43.5547	50.8348	54.1918 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	334.3547	337.8243	329.0811	310.4679	286.9721	264.8894	250.1368	246.6672	255.4104	274.0236	297.5194	319.6021 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254	52.5254 (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)	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454	-100.1454 (71)
Water heating gains (Table 5)	73.2129	71.0434	66.5353	60.4094	56.4314	50.8327	46.0777	52.1741	54.3432	60.6829	67.8421	71.0535 (72)
Total internal gains	565.8922	561.2969	539.3001	505.3088	470.5548	439.5164	421.4742	429.9964	449.6540	483.8593	521.7944	550.4456 (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						
Northeast		2.7000	12.9465	0.4700	0.0000	0.7700	12.6504 (75)					
Southwest		3.0600	40.9830	0.4700	0.0000	0.7700	45.3852 (79)					
Northwest		6.6320	12.9465	0.4700	0.0000	0.7700	31.0733 (81)					
Solar gains	89.1089	155.2523	244.5523	380.7267	465.7079	506.4180	473.3181	397.1350	301.9270	189.5895	112.1103	73.7900 (83)
Total gains	655.0010	716.5493	783.8525	886.0355	936.2627	945.9344	894.7923	827.1313	751.5811	673.4488	633.9047	624.2356 (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	30.1095	30.1960	30.2813	30.6870	30.6870	31.0563	30.9855	30.9855	30.8393	30.6870	30.6086	30.4477
alpha	3.0073	3.0131	3.0188	3.0458	3.0458	3.0704	3.0657	3.0657	3.0560	3.0458	3.0406	3.0298
util living area	0.9561	0.9414	0.9060	0.8219	0.6903	0.5066	0.3441	0.3699	0.6351	0.8500	0.9336	0.9607 (86)
MIT	19.2533	19.4395	19.8335	20.3371	20.7131	20.9228	20.9838	20.9802	20.8421	20.3799	19.7575	19.2293 (87)
Th 2	19.9481	19.9508	19.9534	19.9658	19.9658	19.9768	19.9747	19.9747	19.9703	19.9658	19.9634	19.9585 (88)
util rest of house	0.9485	0.9314	0.8894	0.7907	0.6362	0.4273	0.2445	0.2638	0.5551	0.8155	0.9202	0.9538 (89)
MIT 2	18.3803	18.5643	18.9491	19.4335	19.7664	19.9374	19.9704	19.9693	19.8806	19.4846	18.8885	18.3647 (90)
Living area fraction												0.2147 (91)
MIT	18.5677	18.7522	19.1390	19.6275	19.9696	20.1489	20.1879	20.1863	20.0870	19.6768	19.0750	18.5503 (92)
Temperature adjustment												-0.1500
adjusted MIT	18.4177	18.6022	18.9890	19.4775	19.8196	19.9989	20.0379	20.0363	19.9370	19.5268	18.9250	18.4003 (93)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY FOR IMPROVED DWELLING 09 Jan 2014

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9342	0.9151	0.8708	0.7738	0.6278	0.4291	0.2508	0.2704	0.5523	0.7980	0.9033	0.9404	(94)
Useful gains	611.8704	655.7134	682.5859	685.5748	587.7961	405.8775	224.3920	223.6460	415.0852	537.4230	572.6076	587.0106	(95)
Ext temp.	4.7000	5.2000	7.0000	9.5000	12.5000	15.4000	17.6000	17.6000	15.0000	11.4000	7.7000	4.7000	(96)
Heat loss rate W													
	1314.0154	1280.1137	1141.9087	937.7569	687.9500	427.0999	226.9261	226.7782	461.7276	763.8176	1057.7115	1297.7748	(97)
Month fracti	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	(97a)
Space heating kWh													
	522.3959	419.5970	341.7361	181.5711	74.5145	0.0000	0.0000	0.0000	0.0000	168.4375	349.2748	528.8086	(98)
Space heating												2586.3356	(98)
Space heating per m2												(98) / (4) =	31.4563 (99)

8c. Space cooling requirement

Not applicable

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 %)													90.5000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													2857.8294 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	522.3959	419.5970	341.7361	181.5711	74.5145	0.0000	0.0000	0.0000	0.0000	168.4375	349.2748	528.8086	(98)
Space heating efficiency (main heating system 1)	90.5000	90.5000	90.5000	90.5000	90.5000	0.0000	0.0000	0.0000	0.0000	90.5000	90.5000	90.5000	(210)
Space heating fuel (main heating system)	577.2330	463.6431	377.6090	200.6311	82.3365	0.0000	0.0000	0.0000	0.0000	186.1188	385.9390	584.3189	(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													
Water heating requirement	141.1082	105.8671	83.8788	37.7252	14.7947	0.0000	0.0000	18.8732	41.2234	84.6263	118.3915	140.7897	(64)
Efficiency of water heater	89.8000	89.8366	89.8509	89.9329	89.9538	87.3000	87.3000	87.3000	87.3000	89.4041	89.6679	89.8078	(217)
Fuel for water heating, kWh/month	157.1362	117.8441	93.3533	41.9482	16.4470	0.0000	0.0000	21.6188	47.2204	94.6559	132.0333	156.7677	(219)
												879.0251	(219)
Water heating fuel used													
Annual totals kWh/year													
Space heating fuel - main system													2857.8294 (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)
pump for solar water heating													50.0000 (230g)
Total electricity for the above, kWh/year													125.0000 (231)
Electricity for lighting (calculated in Appendix L)													372.4659 (232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV Unit 0 (0.80 * 2.50 * 1168 * 0.80) =									-1869.2537				-1869.2537 (233)
Total delivered energy for all uses													2365.0667 (238)

10a. Fuel costs - using BEDF prices (479)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year	
Space heating - main system 1	2857.8294	3.7400	106.8828	(240)
Space heating - secondary	0.0000	0.0000	0.0000	(242)
Water heating (other fuel)	879.0251	3.7400	32.8755	(247)
Pumps and fans for heating	75.0000	19.1200	14.3400	(249)
Pump for solar water heating	50.0000	19.1200	9.5600	(249)
Energy for lighting	372.4659	19.1200	71.2155	(250)
Additional standing charges			94.0000	(251)
Energy saving/generation technologies				
PV Unit	-1869.2537	19.1200	-357.4013	(252)
Total energy cost			-28.5275	(255)

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	2857.8294	0.2160	617.2912	(261)
Space heating - secondary	0.0000	0.0000	0.0000	(263)
Water heating (other fuel)	879.0251	0.2160	189.8694	(264)
Space and water heating			807.1606	(265)
Pumps and fans	125.0000	0.5190	64.8750	(267)
Energy for lighting	372.4659	0.5190	193.3098	(268)
Energy saving/generation technologies				
PV Unit	-1869.2537	0.5190	-970.1427	(269)
Total kg/year			95.2027	(272)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)



CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY FOR IMPROVED DWELLING 09 Jan 2014

 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	2857.8294	1.2200	3486.5519 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	879.0251	1.2200	1072.4106 (264)
Space and water heating			4558.9625 (265)
Pumps and fans	125.0000	3.0700	383.7500 (267)
Energy for lighting	372.4659	3.0700	1143.4703 (268)
Energy saving/generation technologies			
PV Unit	-1869.2537	3.0700	-5738.6088 (269)
Primary energy kWh/year			347.5740 (272)
Primary energy kWh/m2/year			4.2274 (273)

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)



Property Reference	125 - PRJ011855	Issued on Date	02/08/2021	
Assessment Reference	125 E	Prop Type Ref	BLO-0297 STO BR-ET 4.1	
Property	125 - PRJ011855			
SAP Rating	84 B	DER	17.63	
Environmental	86 B	TER	18.85	
CO₂ Emissions (t/year)	1.25	% DER<TER	6.48	
General Requirements Compliance	Pass	DFEE	45.82	
		TFEE	54.54	
		% DFEE<TFEE	16.00	
Assessor Details	Mr. Michael Juckes, Michael Juckes, Tel: 02033971373, michael@briaryenergy.co.uk		Assessor ID	T850-0001
Client				

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

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)	18.85	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	17.63	kgCO ₂ /m ²	Pass
	-1.22 (-6.5%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	54.54	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	45.82	kWh/m ² /yr	
	-8.7 (-16.0%)	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)	0.24 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Floor	0.22 (max. 0.25)	0.22 (max. 0.70)	Pass
Roof	0.10 (max. 0.20)	0.10 (max. 0.35)	Pass
Openings	1.28 (max. 2.00)	1.30 (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	5.01 (design value)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)



Main heating system

Boiler system with radiators or underfloor - Mains gas
Data from database
Ideal LOGIC COMBI ESP1 30
Combi boiler
Efficiency: 89.6% SEDBUK2009
Minimum: 88.0%

Pass

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 (East Anglia)

Slight

Pass

Based on:

Overshading

Average

Windows facing North East

2.70 m², No overhang

Windows facing South West

3.06 m², No overhang

Windows facing North West

6.63 m², No overhang

Air change rate

4.21 ach

Blinds/curtains

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

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type

U-value

Filled Cavity with Edge Sealing

0.00

W/m²K

Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

5.01 (design value)

Maximum

10.0

Pass

10 Key features

Party wall U-value

0.00

W/m²K

Roof U-value

0.10

W/m²K

Thermal bridging y-value

0.030

W/m²K

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