

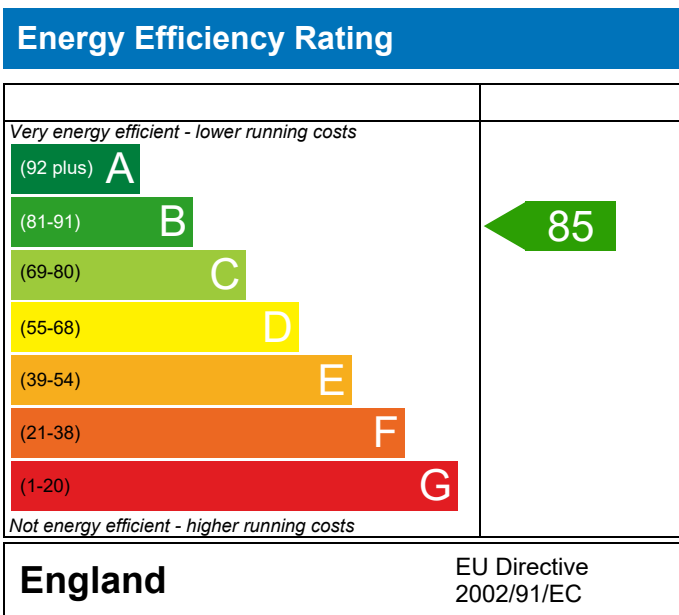
PREDICTED ENERGY ASSESSMENT

125 - PRJ010789 - MF

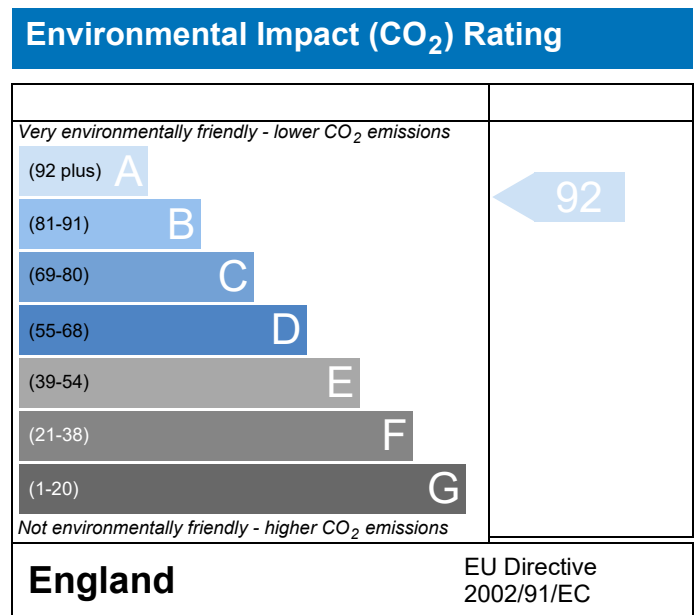
Dwelling type: Flat, Semi-Detached
 Date of assessment: 06/06/2022
 Produced by: Michael Juckes
 Total floor area: 70.95 m²

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.

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

Property Reference	125 - PRJ010789 - MF	Issued on Date	06/06/2022
Assessment Reference	125 S	Prop Type Ref	PRJ010789 - MF
Property	125 - PRJ010789 - MF		

SAP Rating	85 B	DER	11.51	TER	17.51
Environmental	92 A	% DER<TER	34.25		
CO ₂ Emissions (t/year)	0.62	DFEE	40.63	TFEE	45.12
General Requirements Compliance	Pass	% DFEE<TFEE	9.95		

Assessor Details	Chris Nicholls, , Tel: ,	Assessor ID	T850-0001
Client			

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	70.9500 (1b)	x 2.4300 (2b)	= 172.4085 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	70.9500		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 172.4085 (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				2 + 10 =	20.0000 (7a)
Number of passive vents				0 + 10 =	0.0000 (7b)
Number of flueless gas fires				0 + 40 =	0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c)				Air changes per hour	20.0000 / (5) = 0.1160 (8)
Pressure test				Yes	
Measured/design AP50					5.0100
Infiltration rate					0.3665 (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) =	0.3390 (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	0.4153	0.4068	0.3983	0.3560	0.3560	0.3136	0.3221	0.3221	0.3390	0.3560	0.3644	0.3814 (22b)
Effective ac	0.5862	0.5828	0.5793	0.5634	0.5634	0.5492	0.5519	0.5519	0.5575	0.5634	0.5664	0.5727 (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 = 1.40)			15.3800	1.3258	20.3902		(27)
W1 - Brick	16.8610	7.1260	9.7350	0.2500	2.4338	54.9600	535.0356 (29a)
W1 - Render	55.8650	8.2500	47.6150	0.2500	11.9038	61.0100	2904.9912 (29a)
Total net area of external elements Aum(A, m ²)			72.7300				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =	34.7277			(33)
Party Wall			16.7940	0.0000	0.0000	54.0300	907.3798 (32)
Party Floor			70.9450			40.0000	2837.8000 (32d)
Party Ceiling			70.9450			70.0000	4966.1500 (32b)
1st Floor Stud			117.2100			5.8200	682.1619 (32c)
Heat capacity Cm = Sum(A x k)			(28)...(30) + (32) + (32a)...(32e) =			12833.5185	(34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K						180.8812	(35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)						7.5069	(36)
Total fabric heat loss			(33) + (36) =			42.2345	(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	33.3537	33.1555	32.9614	32.0520	32.0520	31.2449	31.3981	31.3981	31.7169	32.0520	32.2257	32.5854 (38)
Heat transfer coeff	75.5882	75.3900	75.1959	74.2865	74.2865	73.4794	73.6326	73.6326	73.9514	74.2865	74.4602	74.8199 (39)
Average = Sum(39)m / 12 =												74.4175 (39)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF HEAT DEMAND 09 Jan 2014

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.0654	1.0626	1.0598	1.0470	1.0470	1.0357	1.0378	1.0378	1.0423	1.0470	1.0495	1.0545 (40)
HLP (average)												1.0489 (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												2.2690 (42)
Average daily hot water use (litres/day)												88.0879 (43)
Daily hot water use	96.8967	93.3732	89.8497	86.3262	82.8027	79.2791	79.2791	82.8027	86.3262	89.8497	93.3732	96.8967 (44)
Energy content (annual)	143.6951	125.6766	129.6870	113.0643	108.4879	93.6168	86.7497	99.5466	100.7355	117.3975	128.1485	139.1610 (45)
Energy content (annual)												1385.9663 (45)
Distribution loss (46)m = 0.15 x (45)m	21.5543	18.8515	19.4531	16.9596	16.2732	14.0425	13.0125	14.9320	15.1103	17.6096	19.2223	20.8741 (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												
Combi loss	14.6346	13.1931	14.5665	14.0511	14.4864	13.9810	14.4232	14.4642	14.0192	14.5334	14.1173	14.6214 (61)
Total heat required for water heating calculated for each month	158.3297	138.8697	144.2535	127.1154	122.9743	107.5977	101.1729	114.0108	114.7546	131.9308	142.2658	153.7824 (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	158.3297	138.8697	144.2535	127.1154	122.9743	107.5977	101.1729	114.0108	114.7546	131.9308	142.2658	153.7824 (64)
Total per year (kWh/year) = Sum(64)m =												1557.0577 (64)
RHI water heating demand												1557 (64)
Heat gains from water heating, kWh/month	51.4373	45.0858	46.7626	41.1067	39.6938	34.6228	32.4501	36.7153	36.9993	42.6680	46.1387	49.9264 (65)

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Metabolic gains (Table 5), Watts (66)m	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	44.5058	39.5297	32.1477	24.3379	18.1928	15.3592	16.5961	21.5723	28.9543	36.7641	42.9091	45.7428 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	297.7673	300.8572	293.0707	276.4943	255.5696	235.9033	222.7651	219.6752	227.4616	244.0380	264.9627	284.6290 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828 (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)	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586 (71)
Water heating gains (Table 5)	69.1361	67.0919	62.8529	57.0926	53.3519	48.0872	43.6157	49.3485	51.3880	57.3495	64.0815	67.1054 (72)
Total internal gains	510.6713	506.7408	487.3334	457.1869	426.3765	398.6119	382.2390	389.8580	407.0659	437.4136	471.2154	496.7392 (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						
North	7.1260	12.0539	0.5000	0.0000	0.7700	33.0700 (74)						
East	6.6230	22.4175	0.5000	0.0000	0.7700	57.1613 (76)						
West	1.6270	22.4175	0.5000	0.0000	0.7700	14.0422 (80)						
Solar gains	104.2735	189.0029	309.1911	488.5868	596.2058	645.9276	604.7781	509.6932	385.1808	234.7038	132.8191	85.2432 (83)
Total gains	614.9448	695.7438	796.5245	945.7737	1022.5822	1044.5395	987.0170	899.5512	792.2467	672.1174	604.0345	581.9824 (84)

7. Mean internal temperature (heating season)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
tau	47.1617	47.2857	47.4077	47.9880	47.9880	48.5152	48.4142	48.4142	48.2055	47.9880	47.8761	47.6460
alpha	4.1441	4.1524	4.1605	4.1992	4.1992	4.2343	4.2276	4.2276	4.2137	4.1992	4.1917	4.1764
util living area	0.9711	0.9524	0.9000	0.7645	0.5835	0.3893	0.2531	0.2774	0.5375	0.8308	0.9468	0.9757 (86)
MIT	19.9028	20.0861	20.4189	20.7722	20.9397	20.9915	20.9990	20.9986	20.9690	20.7314	20.2742	19.8709 (87)
Th 2	20.0292	20.0315	20.0338	20.0443	20.0443	20.0537	20.0519	20.0519	20.0482	20.0443	20.0423	20.0381 (88)
util rest of house	0.9647	0.9423	0.8797	0.7250	0.5273	0.3254	0.1828	0.2005	0.4605	0.7888	0.9335	0.9702 (89)
MIT 2	19.0520	19.2317	19.5504	19.8749	20.0075	20.0502	20.0517	20.0517	20.0335	19.8500	19.4262	19.0282 (90)
Living area fraction												0.4171 (91)
MIT	19.4069	19.5880	19.9126	20.2491	20.3963	20.4428	20.4468	20.4466	20.4237	20.2176	19.7799	19.3796 (92)
Temperature adjustment												-0.1500
adjusted MIT	19.2569	19.4380	19.7626	20.0991	20.2463	20.2928	20.2968	20.2966	20.2737	20.0676	19.6299	19.2296 (93)

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF HEAT DEMAND 09 Jan 2014

 8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9583	0.9349	0.8732	0.7274	0.5396	0.3417	0.2010	0.2204	0.4793	0.7899	0.9265	0.9644 (94)
Useful gains	589.3248	650.4513	695.5615	687.9710	551.7511	356.9313	198.3928	198.2959	379.7480	530.9381	559.6626	561.2728 (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												
Month fracti	1100.3271	1073.4058	959.6943	787.3735	575.4461	359.5182	198.5733	198.5564	389.9962	643.8851	888.3030	1087.1048 (97)
Space heating kWh	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000 (97a)
Space heating	380.1857	284.2254	196.5148	71.5698	17.6291	0.0000	0.0000	0.0000	0.0000	84.0326	236.6210	391.2190 (98)
RHI space heating demand												1661.9975 (98)
												1662 (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	70.9500 (1b)	2.4300 (2b)	172.4085 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	70.9500		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	172.4085 (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				2 * 10 =	20.0000 (7a)
Number of passive vents				0 * 10 =	0.0000 (7b)
Number of flueless gas fires				0 * 40 =	0.0000 (7c)
Air changes per hour					
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =				20.0000 / (5) =	0.1160 (8)
Pressure test				Yes	
Measured/design AP50				5.0100	
Infiltration rate				0.3665	(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) =		0.3390 (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	0.4322	0.4238	0.4153	0.3729	0.3644	0.3221	0.3221	0.3136	0.3390	0.3644	0.3814	0.3983 (22b)
Effective ac	0.5934	0.5898	0.5862	0.5695	0.5664	0.5519	0.5519	0.5492	0.5575	0.5664	0.5727	0.5793 (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 = 1.40)			15.3800	1.3258	20.3902		(27)
W1 - Brick	16.8610	7.1260	9.7350	0.2500	2.4338	54.9600	535.0356 (29a)
W1 - Render	55.8650	8.2500	47.6150	0.2500	11.9038	61.0100	2904.9912 (29a)
Total net area of external elements Aum, m ²			72.7300				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		34.7277		(33)
Party Wall			16.7940	0.0000	0.0000	54.0300	907.3798 (32)
Party Floor			70.9450			40.0000	2837.8000 (32d)
Party Ceiling			70.9450			70.0000	4966.1500 (32b)
1st Floor Stud			117.2100			5.8200	682.1619 (32c)
Heat capacity Cm = Sum (A x k)						(28)...(30) + (32) + (32a)...(32e) =	12833.5185 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							180.8812 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							7.5069 (36)
Total fabric heat loss						(33) + (36) =	42.2345 (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	33.7624	33.5560	33.3537	32.4035	32.2257	31.3981	31.3981	31.2449	31.7169	32.2257	32.5854	32.9614 (38)
Heat transfer coeff	75.9969	75.7905	75.5882	74.6380	74.4602	73.6326	73.6326	73.4794	73.9514	74.4602	74.8199	75.1959 (39)
Average = Sum(39)m / 12 =												74.6372 (39)
HLP	1.0711	1.0682	1.0654	1.0520	1.0495	1.0378	1.0378	1.0357	1.0423	1.0495	1.0545	1.0598 (40)
HLP (average)												1.0520 (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												2.2690 (42)
Average daily hot water use (litres/day)												88.0879 (43)
Daily hot water use	96.8967	93.3732	89.8497	86.3262	82.8027	79.2791	79.2791	82.8027	86.3262	89.8497	93.3732	96.8967 (44)
Energy conte	143.6951	125.6766	129.6870	113.0643	108.4879	93.6168	86.7497	99.5466	100.7355	117.3975	128.1485	139.1610 (45)
Energy content (annual)												Total = Sum(45)m = 1385.9663 (45)
Distribution loss (46)m = 0.15 x (45)m												
Water storage loss:	21.5543	18.8515	19.4531	16.9596	16.2732	14.0425	13.0125	14.9320	15.1103	17.6096	19.2223	20.8741 (46)
Total storage loss												

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

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	0.0000	(56)
Combi loss	14.6346	13.1931	14.5665	14.0511	14.4864	13.9810	14.4232	14.4642	14.0192	14.5334	14.1173	14.6214	14.6214	14.6214	(61)
Total heat required for water heating calculated for each month	158.3297	138.8697	144.2535	127.1154	122.9743	107.5977	101.1729	114.0108	114.7546	131.9308	142.2658	153.7824	153.7824	153.7824	(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	0.0000	0.0000	(63)
Output from w/h	158.3297	138.8697	144.2535	127.1154	122.9743	107.5977	101.1729	114.0108	114.7546	131.9308	142.2658	153.7824	153.7824	153.7824	(64)
Heat gains from water heating, kWh/month	51.4373	45.0858	46.7626	41.1067	39.6938	34.6228	32.4501	36.7153	36.9993	42.6680	46.1387	49.9264	49.9264	49.9264	(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	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	44.5058	39.5297	32.1477	24.3379	18.1928	15.3592	16.5961	21.5723	28.9543	36.7641	42.9091	45.7428	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	297.7673	300.8572	293.0707	276.4943	255.5696	235.9033	222.7651	219.6752	227.4616	244.0380	264.9627	284.6290	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	(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)	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	(71)
Water heating gains (Table 5)	69.1361	67.0919	62.8529	57.0926	53.3519	48.0872	43.6157	49.3485	51.3880	57.3495	64.0815	67.1054	(72)
Total internal gains	510.6713	506.7408	487.3334	457.1869	426.3765	398.6119	382.2390	389.8580	407.0659	437.4136	471.2154	496.7392	(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					
North	7.1260	10.6334	0.5000	0.0000	0.0000	0.7700	29.1728	(74)					
East	6.6230	19.6403	0.5000	0.0000	0.0000	0.7700	50.0798	(76)					
West	1.6270	19.6403	0.5000	0.0000	0.0000	0.7700	12.3026	(80)					
Solar gains	91.5552	177.7839	295.7054	445.2720	564.1940	587.1568	554.9567	463.2571	347.6390	211.1666	113.7719	75.6201	(83)
Total gains	602.2265	684.5248	783.0388	902.4588	990.5705	985.7687	937.1956	853.1151	754.7050	648.5803	584.9874	572.3594	(84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Utilisation factor for gains for living area, nil,m (see Table 9a)	46.9080	47.0358	47.1617	47.7621	47.8761	48.4142	48.4142	48.5152	48.2055	47.8761	47.6460	47.4077	21.0000	(85)
alpha	4.1272	4.1357	4.1441	4.1841	4.1917	4.2276	4.2276	4.2343	4.2137	4.1917	4.1764	4.1605		
util living area	0.9752	0.9576	0.9138	0.8074	0.6435	0.4668	0.3431	0.3914	0.6277	0.8716	0.9583	0.9794	(86)	
MIT	19.8234	20.0248	20.3426	20.6975	20.9045	20.9807	20.9958	20.9929	20.9366	20.6373	20.1695	19.7840	(87)	
Th 2	20.0245	20.0269	20.0292	20.0402	20.0423	20.0519	20.0519	20.0537	20.0482	20.0423	20.0381	20.0338	(88)	
util rest of house	0.9698	0.9486	0.8962	0.7727	0.5908	0.4018	0.2704	0.3131	0.5563	0.8385	0.9479	0.9748	(89)	
MIT 2	18.9701	19.1684	19.4747	19.8077	19.9800	20.0426	20.0506	20.0513	20.0134	19.7661	19.3217	18.9390	(90)	
Living area fraction	19.3260	19.5256	19.8367	20.1788	20.3656	20.4338	20.4448	20.4440	20.3984	20.1294	19.6753	19.2914	(91)	
MIT	19.3260	19.5256	19.8367	20.1788	20.3656	20.4338	20.4448	20.4440	20.3984	20.1294	19.6753	19.2914	(92)	
Temperature adjustment													-0.1500	
adjusted MIT	19.1760	19.3756	19.6867	20.0288	20.2156	20.2838	20.2948	20.2940	20.2484	19.9794	19.5253	19.1414	(93)	

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Useful gains	580.4481	644.3700	696.1777	696.9220	595.0510	412.0031	271.0251	284.2609	431.6743	542.2327	550.5182	554.8501	(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	1130.5287	1097.1128	996.7569	830.6313	634.0702	418.5153	272.0614	286.1299	454.6816	698.3943	929.6561	1123.5334	(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	409.2600	304.2432	223.6309	96.2707	29.0303	0.0000	0.0000	0.0000	0.0000	116.1842	272.9793	423.1003	(98)
Space heating												1874.6989	(98)
Space heating per m2												26.4228	(99)

8c. Space cooling requirement

Not applicable

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF ENERGY RATINGS 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 %)		90.5000 (206)										
Efficiency of secondary/supplementary heating system, %		0.0000 (208)										
Space heating requirement		2071.4905 (211)										
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	409.2600	304.2432	223.6309	96.2707	29.0303	0.0000	0.0000	0.0000	0.0000	116.1842	272.9793	423.1003 (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)	452.2209	336.1803	247.1060	106.3765	32.0777	0.0000	0.0000	0.0000	0.0000	128.3804	301.6346	467.5142 (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	158.3297	138.8697	144.2535	127.1154	122.9743	107.5977	101.1729	114.0108	114.7546	131.9308	142.2658	153.7824 (64)
Efficiency of water heater (217)m	89.5840	89.4722	89.2177	88.6509	87.8935	87.3000	87.3000	87.3000	87.3000	88.7698	89.3776	87.3000 (216)
Fuel for water heating, kWh/month	176.7388	155.2100	161.6871	143.3887	139.9127	123.2506	115.8911	130.5965	131.4486	148.6213	159.1739	171.5857 (219)
Water heating fuel used												1757.5051 (219)
Annual totals kWh/year												2071.4905 (211)
Space heating fuel - main system												0.0000 (215)
Space heating fuel - secondary												
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)												314.3948 (232)
Energy saving/generation technologies (Appendices M ,N and Q)												
PV Unit 0 (0.80 * 0.76 * 1068 * 1.00) =												-649.3869 (233)
Total delivered energy for all uses												3569.0035 (238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2071.4905	3.4800	72.0879 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1757.5051	3.4800	61.1612 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	314.3948	13.1900	41.4687 (250)
Additional standing charges			120.0000 (251)
Energy saving/generation technologies			
PV Unit	0.0000	0.0000	0.0000 (252)
Total energy cost			304.6102 (255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):		0.4200 (256)
Energy cost factor (ECF)	$[(255) \times (256)] / [(4) + 45.0] =$	1.1034 (257)
SAP value		84.6079
SAP rating (Section 12)		85 (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	2071.4905	0.2160	447.4419 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1757.5051	0.2160	379.6211 (264)
Space and water heating			827.0631 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	314.3948	0.5190	163.1709 (268)
Energy saving/generation technologies			
PV Unit	-649.3869	0.5190	-337.0318 (269)
Total kg/year			692.1272 (272)
CO2 emissions per m2			9.7600 (273)
EI value			92.0013
EI rating			92 (274)
EI band			A

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	$3.48 / 0.8848 = 3.933$, stars = 4
Water heating environmental impact	$0.216 / 0.8848 = 0.2441$, stars = 4

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

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	70.9500 (1b)	2.4300 (2b)	172.4085 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	70.9500		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	172.4085 (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				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) =	0.1160 (8)
Pressure test				Yes	
Measured/design AP50					5.0100
Infiltration rate					0.3665 (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) =		0.3390 (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	0.4153	0.4068	0.3983	0.3560	0.3560	0.3136	0.3221	0.3221	0.3390	0.3560	0.3644	0.3814 (22b)
	0.5862	0.5828	0.5793	0.5634	0.5634	0.5492	0.5519	0.5519	0.5575	0.5634	0.5664	0.5727 (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 (U _w = 1.40)			15.3800	1.3258	20.3902		(27)
W1 - Brick	16.8610	7.1260	9.7350	0.2500	2.4338	54.9600	535.0356 (29a)
W1 - Render	55.8650	8.2500	47.6150	0.2500	11.9038	61.0100	2904.9912 (29a)
Total net area of external elements A _{um} , m ²			72.7300				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		34.7277		(33)
Party Wall			16.7940	0.0000	0.0000	54.0300	907.3798 (32)
Party Floor			70.9450			40.0000	2837.8000 (32d)
Party Ceiling			70.9450			70.0000	4966.1500 (32b)
1st Floor Stud			117.2100			5.8200	682.1619 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	12833.5185 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							180.8812 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							7.5069 (36)
Total fabric heat loss						(33) + (36) =	42.2345 (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	33.3537	33.1555	32.9614	32.0520	32.0520	31.2449	31.3981	31.3981	31.7169	32.0520	32.2257	32.5854 (38)
Heat transfer coeff	75.5882	75.3900	75.1959	74.2865	74.2865	73.4794	73.6326	73.6326	73.9514	74.2865	74.4602	74.8199 (39)
Average = Sum(39)m / 12 =												74.4175 (39)
HLP	1.0654	1.0626	1.0598	1.0470	1.0470	1.0357	1.0378	1.0378	1.0423	1.0470	1.0495	1.0545 (40)
HLP (average)												1.0489 (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												2.2690 (42)
Average daily hot water use (litres/day)												88.0879 (43)
Daily hot water use	96.8967	93.3732	89.8497	86.3262	82.8027	79.2791	79.2791	82.8027	86.3262	89.8497	93.3732	96.8967 (44)
Energy conte	143.6951	125.6766	129.6870	113.0643	108.4879	93.6168	86.7497	99.5466	100.7355	117.3975	128.1485	139.1610 (45)
Energy content (annual)												Total = Sum(45)m = 1385.9663 (45)
Distribution loss (46)m = 0.15 x (45)m												
	21.5543	18.8515	19.4531	16.9596	16.2732	14.0425	13.0125	14.9320	15.1103	17.6096	19.2223	20.8741 (46)
Water storage loss:												
Total storage loss												

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

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

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	(56)
Combi loss	14.6346	13.1931	14.5665	14.0511	14.4864	13.9810	14.4232	14.4642	14.0192	14.5334	14.1173	14.6214	14.6214	(61)
Total heat required for water heating calculated for each month	158.3297	138.8697	144.2535	127.1154	122.9743	107.5977	101.1729	114.0108	114.7546	131.9308	142.2658	153.7824	153.7824	(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	0.0000	(63)
Output from w/h	158.3297	138.8697	144.2535	127.1154	122.9743	107.5977	101.1729	114.0108	114.7546	131.9308	142.2658	153.7824	153.7824	(64)
Heat gains from water heating, kWh/month	51.4373	45.0858	46.7626	41.1067	39.6938	34.6228	32.4501	36.7153	36.9993	42.6680	46.1387	49.9264	49.9264	(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	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	136.1380	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	44.5058	39.5297	32.1477	24.3379	18.1928	15.3592	16.5961	21.5723	28.9543	36.7641	42.9091	45.7428	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	297.7673	300.8572	293.0707	276.4943	255.5696	235.9033	222.7651	219.6752	227.4616	244.0380	264.9627	284.6290	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	50.8828	(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)	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	-90.7586	(71)
Water heating gains (Table 5)	69.1361	67.0919	62.8529	57.0926	53.3519	48.0872	43.6157	49.3485	51.3880	57.3495	64.0815	67.1054	(72)
Total internal gains	510.6713	506.7408	487.3334	457.1869	426.3765	398.6119	382.2390	389.8580	407.0659	437.4136	471.2154	496.7392	(73)

6. Solar gains

[Jan]	Area m ²	Solar flux Table 6a W/m ²	Specific data or Table 6b	g Specific data or Table 6c	FF	Access factor Table 6d	Gains W						
North	7.1260	12.0539	0.5000	0.0000	0.7700	33.0700	(74)						
East	6.6230	22.4175	0.5000	0.0000	0.7700	57.1613	(76)						
West	1.6270	22.4175	0.5000	0.0000	0.7700	14.0422	(80)						
Solar gains	104.2735	189.0029	309.1911	488.5868	596.2058	645.9276	604.7781	509.6932	385.1808	234.7038	132.8191	85.2432	(83)
Total gains	614.9448	695.7438	796.5245	945.7737	1022.5822	1044.5395	987.0170	899.5512	792.2467	672.1174	604.0345	581.9824	(84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Utilisation factor for gains for living area, nil,m (see Table 9a)	47.1617	47.2857	47.4077	47.9880	47.9880	48.5152	48.4142	48.4142	48.2055	47.9880	47.8761	47.6460	21.0000	(85)
alpha	4.1441	4.1524	4.1605	4.1992	4.1992	4.2343	4.2276	4.2276	4.2137	4.1992	4.1917	4.1764		
util living area	0.9711	0.9524	0.9000	0.7645	0.5835	0.3893	0.2531	0.2774	0.5375	0.8308	0.9468	0.9757	(86)	
MIT	19.9028	20.0861	20.4189	20.7722	20.9397	20.9915	20.9990	20.9986	20.9690	20.7314	20.2742	19.8709	(87)	
Th 2	20.0292	20.0315	20.0338	20.0443	20.0443	20.0537	20.0519	20.0519	20.0482	20.0443	20.0423	20.0381	(88)	
util rest of house	0.9647	0.9423	0.8797	0.7250	0.5273	0.3254	0.1828	0.2005	0.4605	0.7888	0.9335	0.9702	(89)	
MIT 2	19.0520	19.2317	19.5504	19.8749	20.0075	20.0502	20.0517	20.0517	20.0335	19.8500	19.4262	19.0282	(90)	
Living area fraction	19.4069	19.5880	19.9126	20.2491	20.3963	20.4428	20.4468	20.4466	20.4237	20.2176	19.7799	19.3796	(91)	
MIT	19.4069	19.5880	19.9126	20.2491	20.3963	20.4428	20.4468	20.4466	20.4237	20.2176	19.7799	19.3796	(92)	
Temperature adjustment	19.2569	19.4380	19.7626	20.0991	20.2463	20.2928	20.2968	20.2966	20.2737	20.0676	19.6299	19.2296	(93)	
adjusted MIT	19.2569	19.4380	19.7626	20.0991	20.2463	20.2928	20.2968	20.2966	20.2737	20.0676	19.6299	19.2296	(93)	

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Useful gains	0.9583	0.9349	0.8732	0.7274	0.5396	0.3417	0.2010	0.2204	0.4793	0.7899	0.9265	0.9644	(94)
Ext temp.	589.3248	650.4513	695.5615	687.9710	551.7511	356.9313	198.3928	198.2959	379.7480	530.9381	559.6626	561.2728	(95)
Heat loss rate W	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)
Month fracti	1100.3271	1073.4058	959.6943	787.3735	575.4461	359.5182	198.5733	198.5564	389.9962	643.8851	888.3030	1087.1048	(97)
Space heating kWh	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	(97a)
Space heating	380.1857	284.2254	196.5148	71.5698	17.6291	0.0000	0.0000	0.0000	0.0000	84.0326	236.6210	391.2190	(98)
Space heating per m ²												1661.9975	(98)
										(98) / (4) =		23.4249	(99)

8c. Space cooling requirement

Not applicable

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 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 %)													90.5000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													1836.4613 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	380.1857	284.2254	196.5148	71.5698	17.6291	0.0000	0.0000	0.0000	0.0000	84.0326	236.6210	391.2190	(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)	420.0947	314.0612	217.1434	79.0827	19.4797	0.0000	0.0000	0.0000	0.0000	92.8537	261.4597	432.2862	(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	158.3297	138.8697	144.2535	127.1154	122.9743	107.5977	101.1729	114.0108	114.7546	131.9308	142.2658	153.7824	(64)
Efficiency of water heater (217)m	89.5351	89.4241	89.1172	88.4263	87.6888	87.3000	87.3000	87.3000	87.3000	88.5179	89.2713	87.3000	(216)
Fuel for water heating, kWh/month	176.8354	155.2934	161.8694	143.7530	140.2395	123.2506	115.8911	130.5965	131.4486	149.0443	159.3634	171.6829	(219)
Water heating fuel used													1759.2680 (219)
Annual totals kWh/year													
Space heating fuel - main system													1836.4613 (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)													314.3948 (232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV Unit 0 (0.80 * 0.76 * 1151 * 1.00) =													-699.5751 (233)
Total delivered energy for all uses													3285.5490 (238)

10a. Fuel costs - using BEDF prices (495)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	1836.4613	3.6300	66.6635 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1759.2680	3.6300	63.8614 (247)
Pumps and fans for heating	75.0000	19.4400	14.5800 (249)
Energy for lighting	314.3948	19.4400	61.1183 (250)
Additional standing charges			95.0000 (251)
Energy saving/generation technologies			
PV Unit	0.0000	0.0000	0.0000 (252)
Total energy cost			301.2233 (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	1836.4613	0.2160	396.6756 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1759.2680	0.2160	380.0019 (264)
Space and water heating			776.6775 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	314.3948	0.5190	163.1709 (268)
Energy saving/generation technologies			
PV Unit	-699.5751	0.5190	-363.0795 (269)
Total kg/year			615.6940 (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	1836.4613	1.2200	2240.4828 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1759.2680	1.2200	2146.3069 (264)
Space and water heating			4386.7897 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	314.3948	3.0700	965.1920 (268)
Energy saving/generation technologies			
PV Unit	-699.5751	3.0700	-2147.6954 (269)
Primary energy kWh/year			3434.5363 (272)
Primary energy kWh/m2/year			48.4078 (273)

SAP 2012 EPC IMPROVEMENTS

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

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

Current energy efficiency rating: B 85
 Current environmental impact rating: A 92

(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	Not applicable
O	Not considered
P	Not considered
R	Not considered
S	Not considered
T	Not considered
U Solar photovoltaic panels	Not applicable
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: (none)	SAP change	Cost change	CO2 change
---------------------------------	------------	-------------	------------

Recommended measures (none)	Typical annual savings	Energy efficiency	Environmental impact
	Total Savings £0	0.00 kg/m ²	

Potential energy efficiency rating: B 85
 Potential environmental impact rating: A 92

Fuel prices for cost data on this page from database revision number 495 TEST (29 Apr 2022)
 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	£76	£76	£0
Mains gas	£226	£226	£0
Space heating	£176	£176	£0
Water heating	£64	£64	£0
Lighting	£61	£61	£0
Total cost of fuels	£302	£302	£0
Total cost of uses	£301	£301	£0
Delivered energy	46 kWh/m ²	46 kWh/m ²	0 kWh/m ²
Carbon dioxide emissions	0.6 tonnes	0.6 tonnes	0.0 tonnes
CO2 emissions per m ²	9 kg/m ²	9 kg/m ²	0 kg/m ²
Primary energy	48 kWh/m ²	48 kWh/m ²	0 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

No improvements selected / applicable

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

No improvements selected / applicable

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

Property Reference	125 - PRJ010789 - MF			Issued on Date	06/06/2022
Assessment Reference	125 S	Prop Type Ref	PRJ010789 - MF		
Property	125 - PRJ010789 - MF				
SAP Rating	85 B	DER	11.51	TER	17.51
Environmental	92 A	% DER<TER	34.25		
CO₂ Emissions (t/year)	0.62	DFEE	40.63	TFEE	45.12
General Requirements Compliance	Pass	% DFEE<TFEE	9.95		
Assessor Details	Chris Nicholls, , Tel: ,			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)	17.51	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	11.51	kgCO ₂ /m ²	Pass
	-6.00 (-34.3%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	45.12	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	40.63	kWh/m ² /yr	
	-4.5 (-10.0%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.25 (max. 0.30)	0.25 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Openings	1.40 (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	5.01 (design value)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

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

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

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

7.13 m², No overhang

Windows facing East

6.62 m², No overhang

Windows facing West

1.63 m², No overhang

Air change rate

4.55 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

Photovoltaic array

0.76

kW