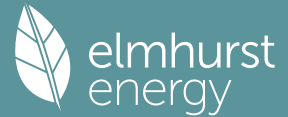


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Plot Reference	01773	Issued on Date	08/01/2026
Assessment Reference	00001	Plot Type Ref	
Plot Address	Unit 1 , 9 , Circuit Lane , Reading , RG30 5HB	SAP Version	10.2
SAP Rating	77 C	DER	24.50
Environmental	75 C	% DER < TER	N/A
CO ₂ Emissions (t/year)	3.26	DFEE	86.08
Compliance Check	N/A	% DFEE < TFEE	
% DPER < TPER		DPER	133.73
Assessor Details	Mr. Matthew Carter	Assessor ID	7869-0001
Client	Simon Knight, Simon Knight		

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

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	61.6000 (1b)	x 2.4000 (2b)	= 147.8400 (1b) - (3b)
First floor	60.7000 (1c)	x 2.6500 (2c)	= 160.8550 (1c) - (3c)
Second floor	33.0000 (1d)	x 2.4600 (2d)	= 81.1800 (1d) - (3d)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	155.3000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 389.8750 (5)

2. Ventilation rate

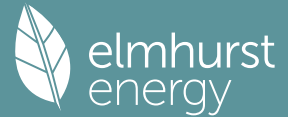
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	6 * 10 = 60.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c)	60.0000 / (5) = 0.1539 (8)
Pressure test	No
Pressure Test Method	Blower Door
Measured/design AP50	15.0000 (17)
Infiltration rate	0.9039 (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) = 0.8361 (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	1.0660	1.0451	1.0242	0.9197	0.8988	0.7943	0.7943	0.7734	0.8361	0.8988	0.9406	0.9824 (22b)
Effective ac	1.0660	1.0451	1.0242	0.9229	0.9039	0.8155	0.8155	0.7991	0.8495	0.9039	0.9424	0.9826 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
Door			1.9100	1.4000	2.6740		(26)
Windows			23.4500	1.3258	31.0890		(27)
Roof windows			1.0900	1.3258	1.4451		(27a)
Existing			36.8800	0.5700	21.0216	110.0000	4056.8000 (28a)
New Floor			24.7200	0.1800	4.4496	75.0000	1854.0000 (28a)
Existing	109.1400	10.7900	98.3500	0.3700	36.3895	190.0000	18686.5000 (29a)
New wall	43.6000	13.7400	29.8600	0.1800	5.3748	190.0000	5673.4000 (29a)
Dwarf wall	12.9000		12.9000	0.1800	2.3220	9.0000	116.1000 (29a)
Dormer Wall	4.2000	0.8300	3.3700	0.1800	0.6066	9.0000	30.3300 (29a)
Loft	28.6000		28.6000	0.1100	3.1460	9.0000	257.4000 (30)
Slope	42.8900	1.0900	41.8000	0.1500	6.2700	9.0000	376.2000 (30)
Total net area of external elements Aum (A, m ²)			302.9300				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	114.7882		(33)
Main dwelling							
Party Wall 1			52.5300	0.0000	0.0000	180.0000	9455.4000 (32)
Internal Wall 1			58.2700			75.0000	4370.2500 (32c)
Internal Wall 2			102.1300			9.0000	919.1700 (32c)
Internal Wall 3			37.3900			75.0000	2804.2500 (32c)

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Internal Floor 1	33.0000	18.0000	594.0000 (32d)
Internal Floor 2	60.7000	18.0000	1092.6000 (32d)
Internal Ceiling 1	61.6000	9.0000	554.4000 (32e)
Internal Ceiling 2	60.7000	9.0000	546.3000 (32e)

Heat capacity Cm = Sum(A x k)
 Thermal mass parameter (TMP = Cm / TFA) in kJ/m²K
 Thermal bridges (Default value 0.200 * total exposed area)
 Point Thermal bridges
 Total fabric heat loss

(28)...(30) + (32) + (32a)...(32e) = 51387.1000 (34)
 330.8892 (35)
 60.5860 (36)
 0.0000 (36a) =
 (33) + (36) + (36a) = 175.3742 (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	137.1543	134.4650	131.7757	118.7439	116.2986	104.9154	104.9154	102.8074	109.3000	116.2986	121.2454	126.4170 (38)
Heat transfer coeff	312.5285	309.8392	307.1499	294.1181	291.6728	280.2896	280.2896	278.1816	284.6742	291.6728	296.6196	301.7912 (39)
Average = Sum(39)m / 12 =												294.0689

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	2.0124	1.9951	1.9778	1.8939	1.8781	1.8048	1.8048	1.7913	1.8331	1.8781	1.9100	1.9433 (40)
HLP (average)												1.8936
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.9422 (42)
Hot water usage for mixer showers	73.5505	72.4452	70.8345	67.7528	65.4786	62.9424	61.5008	63.0993	64.8515	67.5746	70.7225	73.2687 (42a)
Hot water usage for baths	31.7524	31.2808	30.6167	29.3923	28.4755	27.4589	26.9097	27.5691	28.2871	29.3750	30.6246	31.6450 (42b)
Hot water usage for other uses	44.7609	43.1332	41.5055	39.8779	38.2502	36.6225	36.6225	38.2502	39.8779	41.5055	43.1332	44.7609 (42c)
Average daily hot water use (litres/day)												137.9422 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	150.0637	146.8592	142.9568	137.0230	132.2042	127.0237	125.0330	128.9186	133.0165	138.4551	144.4803	149.6746 (44)
Energy content (annual)	237.6643	209.1255	219.7192	187.5776	177.9723	156.1905	151.2166	159.6281	164.0226	187.8822	205.8387	234.3542 (45)
Distribution loss (46)m = 0.15 x (45)m	35.6496	31.3688	32.9579	28.1366	26.6958	23.4286	22.6825	23.9442	24.6034	28.1823	30.8758	35.1531 (46)
Water storage loss (or HIU loss):												
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
If cylinder contains dedicated solar storage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)
Combi loss	14.3270	12.9272	14.2839	13.7630	14.1837	13.6877	14.1195	14.1397	13.7065	14.2075	13.8068	14.3190 (61)
Total heat required for water heating calculated for each month	251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732 (62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)
Output from w/h	251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732 (64)
12Total per year (kWh/year)												2458.6631 (64)
Electric shower(s)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)
												0.0000 (64a)
Heat gains from water heating, kWh/month	82.6051	72.7660	76.6276	65.8103	62.7217	55.3553	53.8094	56.6113	57.9641	66.0227	71.8931	81.5025 (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	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090 (66)

Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5

171.7832	190.1886	171.7832	177.5093	171.7832	177.5093	171.7832	171.7832	177.5093	177.5093	171.7832	177.5093	171.7832 (67)
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Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5

326.2303	329.6156	321.0848	302.9240	279.9991	258.4529	244.0588	240.6735	249.2043	267.3652	290.2900	311.8362 (68)
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Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5

37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109 (69)
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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	3.0000 (70)
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Losses e.g. evaporation (negative values) (Table 5)

-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872 (71)
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Water heating gains (Table 5)

111.0284	108.2828	102.9941	91.4032	84.3034	76.8823	72.3245	76.0904	80.5057	88.7402	99.8515	109.5464 (72)
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Total internal gains

679.1746	698.2196	665.9949	641.9692	606.2184	579.9773	555.2992	555.6799	574.3520	598.0213	637.7835	663.2985 (73)
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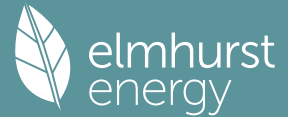
6. Solar gains

[Jan]	Area m ²	Solar flux Table 6a W/m ²	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W
East	14.5700	19.6403	0.6300	0.7000	0.7700	87.4538 (76)
West	8.8800	19.6403	0.6300	0.7000	0.7700	53.3006 (80)
East	1.0900	25.9973	0.6300	0.7000	1.0000	11.2470 (82)

Solar gains	152.0014	297.8620	491.8512	719.4529	883.6330	905.4127	861.6371	738.8439	572.7273	353.7810	189.6195	124.9405 (83)
Total gains	831.1760	996.0816	1157.8460	1361.4220	1489.8514	1485.3900	1416.9363	1294.5237	1147.0794	951.8022	827.4030	788.2390 (84)

7. Mean internal temperature (heating season)

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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	45.6733	46.0697	46.4731	48.5322	48.9391	50.9266	50.9266	51.3125	50.1422	48.9391	48.1229	47.2982
alpha	4.0449	4.0713	4.0982	4.2355	4.2626	4.3951	4.3951	4.4208	4.3428	4.2626	4.2082	4.1532
util living area	0.9995	0.9989	0.9970	0.9894	0.9634	0.8825	0.7541	0.8108	0.9574	0.9951	0.9991	0.9996 (86)
MIT	18.8560	19.0446	19.3809	19.9026	20.3650	20.7576	20.9173	20.8843	20.5669	19.9628	19.3680	18.8891 (87)
Th 2	19.3251	19.3366	19.3482	19.4050	19.4158	19.4666	19.4666	19.4761	19.4469	19.4158	19.3940	19.3714 (88)
util rest of house	0.9993	0.9983	0.9953	0.9824	0.9342	0.7784	0.5458	0.6208	0.9075	0.9908	0.9985	0.9994 (89)
MIT 2	17.4367	17.6333	17.9771	18.5357	18.9890	19.3623	19.4515	19.4500	19.2063	18.6063	17.9976	17.5028 (90)
Living area fraction	fLA = Living area / (4) =											
MIT	17.6802	17.8754	18.2179	18.7701	19.2250	19.6016	19.7029	19.6960	19.4397	18.8390	18.2327	17.7406 (92)
Temperature adjustment	0.0000											
adjusted MIT	17.6802	17.8754	18.2179	18.7701	19.2250	19.6016	19.7029	19.6960	19.4397	18.8390	18.2327	17.7406 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9988	0.9974	0.9935	0.9781	0.9292	0.7903	0.5839	0.6551	0.9071	0.9883	0.9978	0.9991 (94)
Useful gains	830.2089	993.5233	1150.2978	1331.5968	1384.3486	1173.9676	827.3611	848.0566	1040.5275	940.6249	825.5694	787.5544 (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	4181.6869	4020.2854	3599.1592	2902.9868	2194.8380	1401.9002	869.7185	916.8869	1520.0692	2403.0949	3302.1761	4086.4264 (97)
Space heating kWh	2493.4996	2033.9841	1821.9528	1131.4008	603.0041	0.0000	0.0000	0.0000	0.0000	1088.0777	1783.1568	2454.3608 (98a)
Space heating requirement - total per year (kWh/year)												13409.4368
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (98b)
Solar heating contribution - total per year (kWh/year)												0.0000
Space heating kWh	2493.4996	2033.9841	1821.9528	1131.4008	603.0041	0.0000	0.0000	0.0000	0.0000	1088.0777	1783.1568	2454.3608 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												13409.4368
Space heating per m2												(98c) / (4) = 86.3454 (99)

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

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													89.0000 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	2493.4996	2033.9841	1821.9528	1131.4008	603.0041	0.0000	0.0000	0.0000	0.0000	1088.0777	1783.1568	2454.3608	(98)
Space heating efficiency (main heating system 1)	89.0000	89.0000	89.0000	89.0000	89.0000	0.0000	0.0000	0.0000	0.0000	89.0000	89.0000	89.0000	(210)
Space heating fuel (main heating system)	2801.6849	2285.3754	2047.1380	1271.2369	677.5327	0.0000	0.0000	0.0000	0.0000	1222.5592	2003.5469	2757.7088	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732	(64)
Efficiency of water heater	88.8412	88.8297	88.8032	88.7389	88.5831	87.3000	87.3000	87.3000	87.3000	88.7294	88.8103	88.8408	(216)
Fuel for water heating, kWh/month	283.6422	249.9756	263.5076	226.8909	216.9216	194.5912	189.3884	199.0468	203.5843	227.7597	247.3197	279.9087	(217)
Space cooling fuel requirement													
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.3041	7.0685	7.3041	7.0685	7.3041	(231)
Lighting	37.8030	30.3270	27.3061	20.0056	15.4529	12.6252	14.0967	18.3234	23.8002	31.2272	35.2710	38.8537	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1												15066.7829	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												87.3000	
Water heating fuel used												2782.5367	(219)
Space cooling fuel												0.0000	(221)
Electricity for pumps and fans:													
central heating pump													41.0000 (230c)
main heating flue fan													45.0000 (230e)
Total electricity for the above, kWh/year													86.0000 (231)
Electricity for lighting (calculated in Appendix L)													305.0918 (232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation													0.0000 (233)
Wind generation													0.0000 (234)
Hydro-electric generation (Appendix N)													0.0000 (235a)

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Electricity generated - Micro CHP (Appendix N)	0.0000 (235)
Appendix Q - special features	
Energy saved or generated	-0.0000 (236)
Energy used	0.0000 (237)
Total delivered energy for all uses	18240.4115 (238)

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

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year
Space heating - main system 1	15066.7829	0.2100	3164.0244 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	2782.5367	0.2100	584.3327 (264)
Space and water heating			3748.3571 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	305.0918	0.1443	44.0342 (268)
Total CO2, kg/year			3804.3206 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			24.5000 (273)

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

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Space heating - main system 1	15066.7829	1.1300	17025.4647 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2782.5367	1.1300	3144.2665 (278)
Space and water heating			20169.7312 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	305.0918	1.5338	467.9601 (282)
Total Primary energy kWh/year			20767.7920 (286)
Dwelling Primary energy Rate (DPER)			133.7300 (287)

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

1. Overall dwelling characteristics

	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling			
Ground floor	61.6000 (1b)	x 2.4000 (2b)	= 147.8400 (1b) - (3b)
First floor	60.7000 (1c)	x 2.6500 (2c)	= 160.8550 (1c) - (3c)
Second floor	33.0000 (1d)	x 2.4600 (2d)	= 81.1800 (1d) - (3d)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	155.3000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	389.8750 (5)

2. Ventilation rate

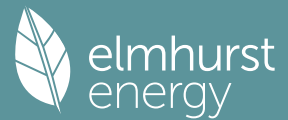
	m3 per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	4 * 10 = 40.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	40.0000 / (5) = 0.1026 (8)
Pressure test	No
Pressure Test Method	Blower Door
Measured/design AP50	15.0000 (17)
Infiltration rate	0.8526 (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) = 0.7887 (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	1.0055	0.9858	0.9661	0.8675	0.8478	0.7492	0.7492	0.7295	0.7887	0.8478	0.8872	0.9267 (22b)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)												0.0000 (23b)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												0.0000 (23c)
Effective ac	1.0055	0.9859	0.9667	0.8763	0.8594	0.7807	0.7807	0.7661	0.8110	0.8594	0.8936	0.9294 (25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K
Main dwelling							
Door			1.9100	1.4000	2.6740		(26)
Windows			23.4500	1.3258	31.0890		(27)

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Roof windows				1.0900	1.3258	1.4451			(27a)
Existing				36.8800	0.5700	21.0216	110.0000	4056.8000	(28a)
New Floor				24.7200	0.1800	4.4496	75.0000	1854.0000	(28a)
Existing	109.1400	10.7900		98.3500	0.3700	36.3895	190.0000	18686.5000	(29a)
New wall	43.6000	13.7400		29.8600	0.1800	5.3748	190.0000	5673.4000	(29a)
Dwarf wall	12.9000			12.9000	0.1800	2.3220	9.0000	116.1000	(29a)
Dormer Wall	4.2000	0.8300		3.3700	0.1800	0.6066	9.0000	30.3300	(29a)
Loft	28.6000			28.6000	0.1100	3.1460	9.0000	257.4000	(30)
Slope	42.8900	1.0900		41.8000	0.1500	6.2700	9.0000	376.2000	(31)
Total net area of external elements Aum(A, m2)				302.9300					(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	114.7882			(33)
Main dwelling									
Party Wall 1				52.5300	0.0000	0.0000	180.0000	9455.4000	(32)
Internal Wall 1				58.2700			75.0000	4370.2500	(32c)
Internal Wall 2				102.1300			9.0000	919.1700	(32c)
Internal Wall 3				37.3900			75.0000	2804.2500	(32c)
Internal Floor 1				33.0000			18.0000	594.0000	(32d)
Internal Floor 2				60.7000			18.0000	1092.6000	(32d)
Internal Ceiling 1				61.6000			9.0000	554.4000	(32e)
Internal Ceiling 2				60.7000			9.0000	546.3000	(32e)

Heat capacity Cm = Sum(A x k)										(28)...(30) + (32) + (32a)...(32e) =				51387.1000	(34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K														330.8892	(35)
Thermal bridges (Default value 0.200 * total exposed area)														60.5860	(36)
Point Thermal bridges														(36a) =	0.0000
Total fabric heat loss										(33) + (36) + (36a) =				175.3742	(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			
	129.3704	126.8467	124.3710	112.7428	110.5672	100.4394	100.4394	98.5639	104.3405	110.5672	114.9684	119.5697	(38)		
Heat transfer coeff	304.7446	302.2209	299.7452	288.1170	285.9414	275.8136	275.8136	273.9381	279.7147	285.9414	290.3426	294.9439	(39)		
Average = Sum(39)m / 12 =												288.1064			
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
	1.9623	1.9460	1.9301	1.8552	1.8412	1.7760	1.7760	1.7639	1.8011	1.8412	1.8696	1.8992	(40)		
HLP (average)												1.8552			
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31			

4. Water heating energy requirements (kWh/year)

Assumed occupancy													2.9422	(42)
Hot water usage for mixer showers														
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		(42a)
Hot water usage for baths														
31.7524	31.2808	30.6167	29.3923	28.4755	27.4589	26.9097	27.5691	28.2871	29.3750	30.6246	31.6450			(42b)
Hot water usage for other uses														
44.7609	43.1332	41.5055	39.8779	38.2502	36.6225	36.6225	38.2502	39.8779	41.5055	43.1332	44.7609			(42c)
Average daily hot water use (litres/day)													70.1311	(43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
76.5132	74.4140	72.1222	69.2702	66.7257	64.0814	63.5322	65.8193	68.1650	70.8805	73.7578	76.4059			(44)
Energy conte	121.1782	105.9645	110.8492	94.8274	89.8256	78.7955	76.8367	81.4981	84.0543	96.1841	105.0815	119.6331		(45)
Energy content (annual)													1164.7282	
Distribution loss (46)m = 0.15 x (45)m														
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		(46)
Water storage loss (or HIU loss):														
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		(56)
If cylinder contains dedicated solar storage														
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		(57)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		(59)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		(61)
Total heat required for water heating calculated for each month														
103.0015	90.0698	94.2218	80.6033	76.3517	66.9762	65.3112	69.2734	71.4461	81.7565	89.3193	101.6881			(62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		(63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		(63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		(63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		(63d)
Output from w/h	103.0015	90.0698	94.2218	80.6033	76.3517	66.9762	65.3112	69.2734	71.4461	81.7565	89.3193	101.6881		(64)
12Total per year (kWh/year)													990.0190	(64)
Electric shower(s)	58.9017	52.4819	57.3082	54.6885	55.7148	53.1465	54.9180	55.7148	54.6885	57.3082	56.2306	58.9017		(64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =													670.0035	(64a)
Heat gains from water heating, kWh/month	40.4758	35.6379	37.8825	33.8230	33.0166	30.0307	30.0573	31.2470	31.5337	34.7662	36.3875	40.1475		(65)

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

Metabolic gains (Table 5), Watts														
(66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
147.1090	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090	147.1090		(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5														
171.7832	190.1886	171.7832	177.5093	171.7832	177.5093	171.7832	171.7832	177.5093	171.7832	177.5093	171.7832	177.5093		(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5														
326.2303	329.6156	321.0848	302.9240	279.9991	258.4529	244.0588	240.6735	249.2043	267.3652	290.2900	311.8362			(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5														
37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109	37.7109		(69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		(70)
Losses e.g. evaporation (negative values) (Table 5)														
-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872		(71)
Water heating gains (Table 5)														
54.4030	53.0326	50.9174	46.9763	44.3772	41.7093	40.3996	41.9987	43.7968	46.7287	50.5381	53.9616			(72)
Total internal gains	619.5492	639.9695	610.9181	594.5423	563.2922	544.8042	523.3743	521.5882	537.6431	553.0098	585.4702	604.7137		(73)

6. Solar gains

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[Jan]	Area m2	Solar flux Table 6a W/m2	Specific data or Table 6b	Specific data or Table 6c	FF Table 6d	Access factor Table 6d	Gains W

East	14.5700	19.6403	0.6300	0.7000	0.7700		87.4538 (76)
West	8.8800	19.6403	0.6300	0.7000	0.7700		53.3006 (80)
East	1.0900	25.9973	0.6300	0.7000	1.0000		11.2470 (82)

Solar gains	152.0014	297.8620	491.8512	719.4529	883.6330	905.4127	861.6371	738.8439	572.7273	353.7810	189.6195	124.9405 (83)
Total gains	771.5506	937.8315	1102.7693	1313.9952	1446.9252	1450.2170	1385.0115	1260.4320	1110.3704	906.7908	775.0897	729.6542 (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	46.8399	47.2310	47.6211	49.5431	49.9200	51.7531	51.7531	52.1074	51.0313	49.9200	49.1633	48.3963
alpha	4.1227	4.1487	4.1747	4.3029	4.3280	4.4502	4.4502	4.4738	4.4021	4.3280	4.2776	4.2264
util living area	0.9996	0.9991	0.9976	0.9906	0.9659	0.8868	0.7589	0.8172	0.9608	0.9959	0.9993	0.9997 (86)
MIT	18.8767	19.0640	19.3970	19.9106	20.3697	20.7586	20.9181	20.8839	20.5665	19.9655	19.3768	18.9050 (87)
Th 2	19.3586	19.3695	19.3803	19.4316	19.4413	19.4868	19.4868	19.4954	19.4692	19.4413	19.4217	19.4014 (88)
util rest of house	0.9995	0.9987	0.9962	0.9843	0.9386	0.7854	0.5530	0.6305	0.9142	0.9924	0.9989	0.9996 (89)
MIT 2	17.4812	17.6762	18.0164	18.5635	19.0139	19.3816	19.4716	19.4685	19.2248	18.6279	18.0265	17.5401 (90)
Living area fraction	17.7206	17.9143	18.2532	18.7946	19.2465	19.6178	19.7197	19.7113	FLA = Living area / (4) =			0.1715 (91)
MIT	17.7206	17.9143	18.2532	18.7946	19.2465	19.6178	19.7197	19.7113	19.4549	18.8573	18.2581	17.7742 (92)
Temperature adjustment												0.0000
adjusted MIT	17.7206	17.9143	18.2532	18.7946	19.2465	19.6178	19.7197	19.7113	19.4549	18.8573	18.2581	17.7742 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9992	0.9980	0.9946	0.9804	0.9337	0.7969	0.5907	0.6642	0.9136	0.9901	0.9983	0.9994 (94)
Useful gains	770.9043	935.9650	1096.8174	1288.2862	1350.9883	1155.7349	818.1117	837.1784	1014.4167	897.8587	773.7900	729.2064 (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	4089.8578	3933.1822	3522.9636	2850.7932	2157.8587	1383.9852	860.4587	907.0932	1497.8520	2361.1131	3239.6715	4003.6380 (97)
Space heating kWh	2469.3014	2014.1299	1805.0528	1125.0050	600.3116	0.0000	0.0000	0.0000	0.0000	1088.6613	1775.4347	2436.1771 (98a)
Space heating requirement - total per year (kWh/year)												13314.0738
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (98b)
Solar heating contribution - total per year (kWh/year)												0.0000
Space heating kWh	2469.3014	2014.1299	1805.0528	1125.0050	600.3116	0.0000	0.0000	0.0000	0.0000	1088.6613	1775.4347	2436.1771 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												13314.0738
Space heating per m2										(98c) / (4) =		85.7313 (99)

8c. Space cooling requirement

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

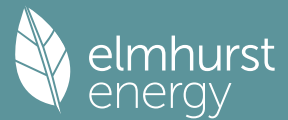
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ext. temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000
Heat loss rate W	0.0000	0.0000	0.0000	0.0000	0.0000	2592.6476	2041.0205	2081.9292	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.5882	0.6840	0.6268	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	1524.8715	1396.0915	1304.9926	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	1602.4184	1530.3418	1390.1591	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	55.8338	99.8822	63.3639	0.0000	0.0000	0.0000	0.0000 (104)
Cooled fraction									fc = cooled area / (4) =			1.0000 (105)
Intermittency factor (Table 10b)	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500 (106)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	13.9584	24.9706	15.8410	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												54.7700 (107)
Energy for space heating												85.7313 (99)
Energy for space cooling												0.3527 (108)
Total												86.0840 (109)
Fabric Energy Efficiency (DFEE)												86.1 (109)

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

1. Overall dwelling characteristics

	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling			
Ground floor	61.6000 (1b)	x 2.4000 (2b)	= 147.8400 (1b) - (3b)
First floor	60.7000 (1c)	x 2.6500 (2c)	= 160.8550 (1c) - (3c)
Second floor	33.0000 (1d)	x 2.4600 (2d)	= 81.1800 (1d) - (3d)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	155.3000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	389.8750 (5)

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2. Ventilation rate

											m3 per hour	
Number of open chimneys											0 * 80 =	0.0000 (6a)
Number of open flues											0 * 20 =	0.0000 (6b)
Number of chimneys / flues attached to closed fire											0 * 10 =	0.0000 (6c)
Number of flues attached to solid fuel boiler											0 * 20 =	0.0000 (6d)
Number of flues attached to other heater											0 * 35 =	0.0000 (6e)
Number of blocked chimneys											0 * 20 =	0.0000 (6f)
Number of intermittent extract fans											6 * 10 =	60.0000 (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)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =										60.0000 / (5) =	0.1539 (8)
Pressure test											No	
Pressure Test Method											Blower Door	
Measured/design AP50											15.0000 (17)	
Infiltration rate											0.9039 (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) =	0.8361 (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	1.0660	1.0451	1.0242	0.9197	0.8988	0.7943	0.7943	0.7734	0.8361	0.8988	0.9406	0.9824 (22b)
Effective ac	1.0660	1.0451	1.0242	0.9229	0.9039	0.8155	0.8155	0.7991	0.8495	0.9039	0.9424	0.9826 (25)

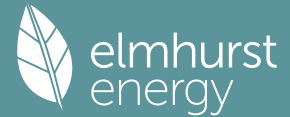
3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K					
Main dwelling												
Door			1.9100	1.4000	2.6740			(26)				
Windows			23.4500	1.3258	31.0890			(27)				
Roof windows			1.0900	1.3258	1.4451			(27a)				
Existing			36.8800	0.5700	21.0216	110.0000	4056.8000	(28a)				
New Floor			24.7200	0.1800	4.4496	75.0000	1854.0000	(28a)				
Existing	109.1400	10.7900	98.3500	0.3700	36.3895	190.0000	18686.5000	(29a)				
New wall	43.6000	13.7400	29.8600	0.1800	5.3748	190.0000	5673.4000	(29a)				
Dwarf wall	12.9000		12.9000	0.1800	2.3220	9.0000	116.1000	(29a)				
Dormer Wall	4.2000	0.8300	3.3700	0.1800	0.6066	9.0000	30.3300	(29a)				
Loft	28.6000		28.6000	0.1100	3.1460	9.0000	257.4000	(30)				
Slope	42.8900	1.0900	41.8000	0.1500	6.2700	9.0000	376.2000	(30)				
Total net area of external elements Aum(A, m2)			302.9300					(31)				
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		114.7882			(33)				
Main dwelling												
Party Wall 1			52.5300	0.0000	0.0000	180.0000	9455.4000	(32)				
Internal Wall 1			58.2700			75.0000	4370.2500	(32c)				
Internal Wall 2			102.1300			9.0000	919.1700	(32c)				
Internal Wall 3			37.3900			75.0000	2804.2500	(32c)				
Internal Floor 1			33.0000			18.0000	594.0000	(32d)				
Internal Floor 2			60.7000			18.0000	1092.6000	(32d)				
Internal Ceiling 1			61.6000			9.0000	554.4000	(32e)				
Internal Ceiling 2			60.7000			9.0000	546.3000	(32e)				
Heat capacity Cm = Sum(A x k)					(28)...(30) + (32) + (32a)...(32e) =		51387.1000	(34)				
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							330.8892	(35)				
Thermal bridges (Default value 0.200 * total exposed area)							60.5860	(36)				
Point Thermal bridges					(36a) =		0.0000					
Total fabric heat loss					(33) + (36) + (36a) =		175.3742	(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	137.1543	134.4650	131.7757	118.7439	116.2986	104.9154	104.9154	102.8074	109.3000	116.2986	121.2454	126.4170
Average = Sum(39)m / 12 =	312.5285	309.8392	307.1499	294.1181	291.6728	280.2896	280.2896	278.1816	284.6742	291.6728	296.6196	301.7912
												294.0689
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	2.0124	1.9951	1.9778	1.8939	1.8781	1.8048	1.8048	1.7913	1.8331	1.8781	1.9100	1.9433
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy													2.9422	(42)
Hot water usage for mixer showers														
	73.5505	72.4452	70.8345	67.7528	65.4786	62.9424	61.5008	63.0993	64.8515	67.5746	70.7225	73.2687	(42a)	
Hot water usage for baths	31.7524	31.2808	30.6167	29.3923	28.4755	27.4589	26.9097	27.5691	28.2871	29.3750	30.6246	31.6450	(42b)	
Hot water usage for other uses	44.7609	43.1332	41.5055	39.8779	38.2502	36.6225	36.6225	38.2502	39.8779	41.5055	43.1332	44.7609	(42c)	
Average daily hot water use (litres/day)													137.9422	(43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Energy conte	150.0637	146.8592	142.9568	137.0230	132.2042	127.0237	125.0330	128.9186	133.0165	138.4551	144.4803	149.6746	(44)	
Energy content (annual)	237.6643	209.1255	219.7192	187.5776	177.9723	156.1905	151.2166	159.6281	164.0226	187.8822	205.8387	234.3542	(45)	
Distribution loss (46)m = 0.15 x (45)m													Total = Sum(45)m =	2291.1919
	35.6496	31.3688	32.9579	28.1366	26.6958	23.4286	22.6825	23.9442	24.6034	28.1823	30.8758	35.1531	(46)	
Water storage loss (or HIU loss):														
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(56)	
If cylinder contains dedicated solar storage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(57)	
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(59)	
Combi loss	14.3270	12.9272	14.2839	13.7630	14.1837	13.6877	14.1195	14.1397	13.7065	14.2075	13.8068	14.3190	(61)	

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Total heat required for water heating calculated for each month												
	251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732 (62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)
Output from w/h	251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732 (64)
Total per year (kWh/year) = Sum(64)m =												2458.6631 (64)
Electric shower(s)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000 (64a)
Heat gains from water heating, kWh/month	82.6051	72.7660	76.6276	65.8103	62.7217	55.3553	53.8094	56.6113	57.9641	66.0227	71.8931	81.5025 (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	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	43.1889	38.3600	31.1965	23.6177	17.6545	14.9047	16.1050	20.9339	28.0975	35.6762	41.6394	44.3893 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	486.9109	491.9635	479.2311	452.1253	417.9091	385.7507	364.2669	359.2143	371.9467	399.0525	433.2687	465.4271 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953 (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)	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872 (71)
Water heating gains (Table 5)	111.0284	108.2828	102.9941	91.4032	84.3034	76.8823	72.3245	76.0904	80.5057	88.7402	99.8515	109.5464 (72)
Total internal gains	758.5670	756.0452	730.8605	684.5850	637.3058	591.9765	567.1352	570.6775	594.9888	640.9078	692.1984	736.8016 (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		
East				14.5700	19.6403		0.6300		0.7000		0.7700		87.4538 (76)
West				8.8800	19.6403		0.6300		0.7000		0.7700		53.3006 (80)
East				1.0900	25.9973		0.6300		0.7000		1.0000		11.2470 (82)
Solar gains	152.0014	297.8620	491.8512	719.4529	883.6330	905.4127	861.6371	738.8439	572.7273	353.7810	189.6195	124.9405 (83)	
Total gains	910.5684	1053.9072	1222.7117	1404.0379	1520.9388	1497.3892	1428.7723	1309.5213	1167.7161	994.6887	881.8179	861.7421 (84)	

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												
Utilisation factor for gains for living area, nil,m (see Table 9a)												21.0000 (85)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	45.6733	46.0697	46.4731	48.5322	48.9391	50.9266	50.9266	51.3125	50.1422	48.9391	48.1229	47.2982
alpha	4.0449	4.0713	4.0982	4.2355	4.2626	4.3951	4.3951	4.4208	4.3428	4.2626	4.2082	4.1532
util living area	0.9993	0.9986	0.9964	0.9881	0.9608	0.8800	0.7503	0.8060	0.9548	0.9942	0.9988	0.9995 (86)
MIT	18.8947	19.0728	19.4122	19.9227	20.3780	20.7610	20.9190	20.8873	20.5753	19.9836	19.3948	18.9253 (87)
Th 2	19.3251	19.3366	19.3482	19.4050	19.4158	19.4666	19.4666	19.4761	19.4469	19.4158	19.3940	19.3714 (88)
util rest of house	0.9989	0.9979	0.9943	0.9804	0.9301	0.7748	0.5418	0.6151	0.9028	0.9892	0.9981	0.9992 (89)
MIT 2	17.4753	17.6614	18.0082	18.5550	19.0003	19.3643	19.4519	19.4509	19.2129	18.6267	18.0243	17.5389 (90)
Living area fraction	FLA = Living area / (4) =											
MIT	17.7188	17.9035	18.2490	18.7896	19.2366	19.6039	19.7036	19.6973	19.4466	18.8594	18.2594	17.7767 (92)
Temperature adjustment	0.0000											
adjusted MIT	17.7188	17.9035	18.2490	18.7896	19.2366	19.6039	19.7036	19.6973	19.4466	18.8594	18.2594	17.7767 (93)

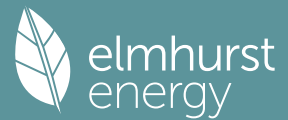
8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9984	0.9969	0.9921	0.9758	0.9251	0.7870	0.5800	0.6496	0.9027	0.9863	0.9972	0.9988 (94)
Useful gains	909.0884	1050.5922	1213.0930	1370.0725	1407.0540	1178.5155	828.6277	850.6402	1054.1512	981.1044	879.3415	860.6932 (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	4193.7596	4028.9825	3608.7150	2908.7177	2198.2173	1402.5298	869.8981	917.2415	1522.0409	2409.0461	3310.1043	4097.3273 (97)
Space heating kWh	2443.7953	2001.4783	1782.3428	1107.8246	588.6255	0.0000	0.0000	0.0000	0.0000	1062.3887	1750.1493	2408.0558 (98a)
Space heating requirement - total per year (kWh/year)	13144.6602											
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (98b)
Solar heating contribution - total per year (kWh/year)	0.0000											
Space heating kWh	2443.7953	2001.4783	1782.3428	1107.8246	588.6255	0.0000	0.0000	0.0000	0.0000	1062.3887	1750.1493	2408.0558 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)	13144.6602											
Space heating per m ²	(98c) / (4) = 84.6404 (99)											

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

Fraction of space heat from secondary/supplementary system (Table 11)	0.0000 (201)
Fraction of space heat from main system(s)	1.0000 (202)
Efficiency of main space heating system 1 (in %)	89.0000 (206)
Efficiency of main space heating system 2 (in %)	0.0000 (207)
Efficiency of secondary/supplementary heating system, %	0.0000 (208)

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	2443.7953	2001.4783	1782.3428	1107.8246	588.6255	0.0000	0.0000	0.0000	0.0000	1062.3887	1750.1493	2408.0558	(98)
Space heating efficiency (main heating system 1)	89.0000	89.0000	89.0000	89.0000	89.0000	0.0000	0.0000	0.0000	0.0000	89.0000	89.0000	89.0000	(210)
Space heating fuel (main heating system)	2745.8375	2248.8520	2002.6324	1244.7467	661.3769	0.0000	0.0000	0.0000	0.0000	1193.6952	1966.4598	2705.6806	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating requirement	251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732	(64)
Efficiency of water heater (217)m	88.8383	88.8273	88.7993	88.7343	88.5755	87.3000	87.3000	87.3000	87.3000	88.7239	88.8072	87.3000	(216)
Fuel for water heating, kWh/month	283.6516	249.9826	263.5190	226.9029	216.9403	194.5912	189.3884	199.0468	203.5843	227.7738	247.3286	279.9174	(217)
Space cooling fuel requirement	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.3041	7.0685	7.3041	7.0685	7.3041	(231)
Lighting	37.8030	30.3270	27.3061	20.0056	15.4529	12.6252	14.0967	18.3234	23.8002	31.2272	35.2710	38.8537	(232)
Electricity generated by PVs (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
(233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
(233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1												14769.2811	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												87.3000	(216)
Water heating fuel used												2782.6268	(219)
Space cooling fuel												0.0000	(221)
Electricity for pumps and fans:													
central heating pump												41.0000	(230c)
main heating flue fan												45.0000	(230e)
Total electricity for the above, kWh/year												86.0000	(231)
Electricity for lighting (calculated in Appendix L)												305.0918	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation												0.0000	(233)
Wind generation												0.0000	(234)
Hydro-electric generation (Appendix N)												0.0000	(235a)
Electricity generated - Micro CHP (Appendix N)												0.0000	(235)
Appendix Q - special features													
Energy saved or generated												-0.0000	(236)
Energy used												0.0000	(237)
Total delivered energy for all uses												17942.9997	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year	
Space heating - main system 1	14769.2811	3.6400	537.6018	(240)
Total CO2 associated with community systems			0.0000	(473)
Water heating (other fuel)	2782.6268	3.6400	101.2876	(247)
Energy for instantaneous electric shower(s)	0.0000	16.4900	0.0000	(247a)
Pumps, fans and electric keep-hot	86.0000	16.4900	14.1814	(249)
Energy for lighting	305.0918	16.4900	50.3096	(250)
Additional standing charges			92.0000	(251)
Total energy cost			795.3805	(255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):		0.3600	(256)
Energy cost factor (ECF)		1.4295	(257)
SAP value		76.8271	
SAP rating (Section 12)		77	(258)
SAP band		C	

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	14769.2811	0.2100	3101.5490	(261)
Total CO2 associated with community systems			0.0000	(373)
Water heating (other fuel)	2782.6268	0.2100	584.3516	(264)
Space and water heating			3685.9007	(265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293	(267)
Energy for lighting	305.0918	0.1443	44.0342	(268)
Total CO2, kg/year			3741.8641	(272)
CO2 emissions per m2			24.0900	(273)
EI value			74.9671	
EI rating			75	(274)
EI band			C	

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SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY

1. Overall dwelling characteristics

Main dwelling	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	61.6000 (1b)	x 2.4000 (2b)	= 147.8400 (1b) - (3b)
First floor	60.7000 (1c)	x 2.6500 (2c)	= 160.8550 (1c) - (3c)
Second floor	33.0000 (1d)	x 2.4600 (2d)	= 81.1800 (1d) - (3d)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	155.3000		(4)
Dwelling volume		(3a) + (3b) + (3c) + (3d) + (3e) ... (3n) =	389.8750 (5)

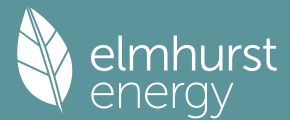
2. Ventilation rate

											m3 per hour	
Number of open chimneys											0 * 80 =	0.0000 (6a)
Number of open flues											0 * 20 =	0.0000 (6b)
Number of chimneys / flues attached to closed fire											0 * 10 =	0.0000 (6c)
Number of flues attached to solid fuel boiler											0 * 20 =	0.0000 (6d)
Number of flues attached to other heater											0 * 35 =	0.0000 (6e)
Number of blocked chimneys											0 * 20 =	0.0000 (6f)
Number of intermittent extract fans											6 * 10 =	60.0000 (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)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =										60.0000 / (5) =	0.1539 (8)
Pressure test											No	
Pressure Test Method											Blower Door	
Measured/design AP50											15.0000	(17)
Infiltration rate											0.9039	(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) =	0.8361 (21)
Wind speed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind factor	4.4000	4.1000	4.1000	3.9000	3.9000	3.4000	3.4000	3.3000	3.4000	3.8000	3.7000	4.0000 (22)
Adj infilt rate	1.1000	1.0250	1.0250	0.9750	0.9750	0.8500	0.8500	0.8250	0.8500	0.9500	0.9250	1.0000 (22a)
	0.9197	0.8570	0.8570	0.8152	0.8152	0.7107	0.7107	0.6898	0.7107	0.7943	0.7734	0.8361 (22b)
Effective ac	0.9229	0.8672	0.8672	0.8323	0.8323	0.7525	0.7525	0.7379	0.7525	0.8155	0.7991	0.8495 (25)

3. Heat losses and heat loss parameter

Element	Gross	Openings	NetArea	U-value	A x U	K-value	A x K
Main dwelling	m2	m2	m2	W/m2K	W/K	kJ/m2K	kJ/K
Door			1.9100	1.4000	2.6740		(26)
Windows			23.4500	1.3258	31.0890		(27)
Roof windows			1.0900	1.3258	1.4451		(27a)
Existing			36.8800	0.5700	21.0216	110.0000	4056.8000 (28a)
New Floor			24.7200	0.1800	4.4496	75.0000	1854.0000 (28a)
Existing	109.1400	10.7900	98.3500	0.3700	36.3895	190.0000	18686.5000 (29a)
New wall	43.6000	13.7400	29.8600	0.1800	5.3748	190.0000	5673.4000 (29a)
Dwarf wall	12.9000		12.9000	0.1800	2.3220	9.0000	116.1000 (29a)
Dormer Wall	4.2000	0.8300	3.3700	0.1800	0.6066	9.0000	30.3300 (29a)
Loft	28.6000		28.6000	0.1100	3.1460	9.0000	257.4000 (30)
Slope	42.8900	1.0900	41.8000	0.1500	6.2700	9.0000	376.2000 (30)
Total net area of external elements Aum(A, m2)			302.9300				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	114.7882		(33)
Main dwelling							
Party Wall 1			52.5300	0.0000	0.0000	180.0000	9455.4000 (32)
Internal Wall 1			58.2700			75.0000	4370.2500 (32c)
Internal Wall 2			102.1300			9.0000	919.1700 (32c)
Internal Wall 3			37.3900			75.0000	2804.2500 (32c)
Internal Floor 1			33.0000			18.0000	594.0000 (32d)
Internal Floor 2			60.7000			18.0000	1092.6000 (32d)
Internal Ceiling 1			61.6000			9.0000	554.4000 (32e)
Internal Ceiling 2			60.7000			9.0000	546.3000 (32e)
Heat capacity Cm = Sum(A x k)					(28)...(30) + (32) + (32a)...(32e) =		51387.1000 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							330.8892 (35)
Thermal bridges (Default value 0.200 * total exposed area)							60.5860 (36)
Point Thermal bridges						(36a) =	0.0000
Total fabric heat loss						(33) + (36) + (36a) =	175.3742 (37)

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4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.9422 (42)
Hot water usage for mixer showers	73.5505	72.4452	70.8345	67.7528	65.4786	62.9424	61.5008	63.0993	64.8515	67.5746	70.7225	73.2687 (42a)
Hot water usage for baths	31.7524	31.2808	30.6167	29.3923	28.4755	27.4589	26.9097	27.5691	28.2871	29.3750	30.6246	31.6450 (42b)
Hot water usage for other uses	44.7609	43.1332	41.5055	39.8779	38.2502	36.6225	36.6225	38.2502	39.8779	41.5055	43.1332	44.7609 (42c)
Average daily hot water use (litres/day)												137.9422 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	150.0637	146.8592	142.9568	137.0230	132.2042	127.0237	125.0330	128.9186	133.0165	138.4551	144.4803	149.6746 (44)
Energy content	237.6643	209.1255	219.7192	187.5776	177.9723	156.1905	151.2166	159.6281	164.0226	187.8822	205.8387	234.3542 (45)
Energy content (annual)											Total = Sum(45)m =	2291.1919
Distribution loss (46)m = 0.15 x (45)m	35.6496	31.3688	32.9579	28.1366	26.6958	23.4286	22.6825	23.9442	24.6034	28.1823	30.8758	35.1531 (46)
Water storage loss (or HIU loss):												
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
If cylinder contains dedicated solar storage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)
Combi loss	14.3270	12.9272	14.2839	13.7630	14.1837	13.6877	14.1195	14.1397	13.7065	14.2075	13.8068	14.3190 (61)
Total heat required for water heating calculated for each month	251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732 (62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)
Output from w/h	251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732 (64)
Electric shower(s)	Total per year (kWh/year) = Sum(64)m =											2458.6631 (64)
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)
	Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =											0.0000 (64a)
Heat gains from water heating, kWh/month	82.6051	72.7660	76.6276	65.8103	62.7217	55.3553	53.8094	56.6113	57.9641	66.0227	71.8931	81.5025 (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	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	43.1889	38.3600	31.1965	23.6177	17.6545	14.9047	16.1050	20.9339	28.0975	35.6762	41.6394	44.3893 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	486.9109	491.9635	479.2311	452.1253	417.9091	385.7507	364.2669	359.2143	371.9467	399.0525	433.2687	465.4271 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953 (69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872 (71)
Water heating gains (Table 5)	111.0284	108.2828	102.9941	91.4032	84.3034	76.8823	72.3245	76.0904	80.5057	88.7402	99.8515	109.5464 (72)
Total internal gains	758.5670	756.0452	730.8605	684.5850	637.3058	591.9765	567.1352	570.6775	594.9888	640.9078	692.1984	736.8016 (73)

6. Solar gains

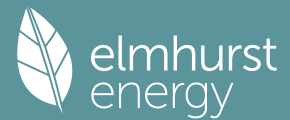
[Jan]						Area m2	Solar flux Table 6a W/m2		g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W	
East						14.5700	23.7835		0.6300	0.7000	0.7700	105.9027 (76)	
West						8.8800	23.7835		0.6300	0.7000	0.7700	64.5447 (80)	
East						1.0900	31.6691		0.6300	0.7000	1.0000	13.7007 (82)	
Solar gains	184.1480	315.2224	515.8801	764.1875	912.8307	988.7492	931.9097	815.7345	639.7269	401.6508	226.2976	152.2318	(83)
Total gains	942.7151	1071.2675	1246.7406	1448.7725	1550.1365	1580.7257	1499.0450	1386.4120	1234.7156	1042.5586	918.4961	889.0334	(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	48.5322	49.7444	49.7444	50.5364	50.5364	52.4411	52.4411	52.8064	52.4411	50.9266	51.3125	50.1422
alpha	4.2355	4.3163	4.3163	4.3691	4.3691	4.4961	4.4961	4.5204	4.4961	4.3951	4.4208	4.3428
util living area	0.9991	0.9984	0.9952	0.9824	0.9376	0.7871	0.5883	0.6527	0.9197	0.9905	0.9984	0.9993 (86)
MIT	19.1180	19.3138	19.6570	20.1139	20.5536	20.8859	20.9780	20.9655	20.7210	20.1676	19.6145	19.1522 (87)
Th 2	19.4050	19.4368	19.4368	19.4569	19.4569	19.5033	19.5033	19.5119	19.5033	19.4666	19.4761	19.4469 (88)
util rest of house	0.9987	0.9975	0.9923	0.9705	0.8875	0.6305	0.3437	0.4073	0.8325	0.9818	0.9973	0.9990 (89)
MIT 2	17.7555	17.9740	18.3160	18.7805	19.1899	19.4700	19.5018	19.5088	19.3758	18.8455	18.3034	17.8201 (90)
Living area fraction	17.9892	18.2038	18.5460	19.0093	19.4239	19.7129	19.7551	19.7587	19.6065	19.0723	18.5283	18.0486 (91)
MIT	17.9892	18.2038	18.5460	19.0093	19.4239	19.7129	19.7551	19.7587	19.6065	19.0723	18.5283	18.0486 (92)
Temperature adjustment												0.0000
adjusted MIT	17.9892	18.2038	18.5460	19.0093	19.4239	19.7129	19.7551	19.7587	19.6065	19.0723	18.5283	18.0486 (93)

8. Space heating requirement

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9980	0.9964	0.9898	0.9654	0.8860	0.6567	0.3878	0.4524	0.8409	0.9782	0.9962	0.9985	(94)
Useful gains	940.8762	1067.4319	1234.0430	1398.6148	1373.4338	1038.0264	581.3094	627.1506	1038.2811	1019.8105	915.0162	887.7149	(95)
Ext temp.	4.9000	5.5000	7.3000	9.7000	12.7000	15.6000	17.6000	17.4000	14.8000	11.4000	7.8000	4.9000	(96)
Heat loss rate W	3849.7814	3645.3707	3227.0528	2629.4374	1899.1788	1119.5165	586.5963	637.5740	1308.3133	2150.4530	2984.4084	3743.0638	(97)
Space heating kWh	2164.2255	1732.3749	1482.7993	886.1923	391.1543	0.0000	0.0000	0.0000	0.0000	841.1980	1489.9624	2124.3796	(98a)
Space heating requirement - total per year (kWh/year)												11112.2863	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	2164.2255	1732.3749	1482.7993	886.1923	391.1543	0.0000	0.0000	0.0000	0.0000	841.1980	1489.9624	2124.3796	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												11112.2863	
Space heating per m2										(98c) / (4) =		71.5537	(99)

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

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000	(201)
Fraction of space heat from main system(s)													1.0000	(202)
Efficiency of main space heating system 1 (in %)													89.0000	(206)
Efficiency of main space heating system 2 (in %)													0.0000	(207)
Efficiency of secondary/supplementary heating system, %													0.0000	(208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Space heating requirement	2164.2255	1732.3749	1482.7993	886.1923	391.1543	0.0000	0.0000	0.0000	0.0000	841.1980	1489.9624	2124.3796	(98)	
Space heating efficiency (main heating system 1)	89.0000	89.0000	89.0000	89.0000	89.0000	0.0000	0.0000	0.0000	0.0000	89.0000	89.0000	89.0000	(210)	
Space heating fuel (main heating system)	2431.7140	1946.4887	1666.0666	995.7217	439.4992	0.0000	0.0000	0.0000	0.0000	945.1663	1674.1150	2386.9434	(211)	
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)	
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)	
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)	
Water heating														
Water heating requirement	251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732	(64)	
Efficiency of water heater (217)m	88.8196	88.8035	88.7644	88.6803	88.4327	87.3000	87.3000	87.3000	87.3000	88.6656	88.7779	88.8188	(216)	
Fuel for water heating, kWh/month	283.7112	250.0494	263.6227	227.0409	217.2906	194.5912	189.3884	199.0468	203.5843	227.9236	247.4101	279.9783	(217)	
Space cooling fuel requirement														
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)	
Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.3041	7.0685	7.3041	7.0685	7.3041	(231)	
Lighting	37.8030	30.3270	27.3061	20.0056	15.4529	12.6252	14.0967	18.3234	23.8002	31.2272	35.2710	38.8537	(232)	
Electricity generated by PVs (Appendix M) (negative quantity)														
(233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)	
Electricity generated by wind turbines (Appendix M) (negative quantity)														
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)	
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)														
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)	
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)														
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)	
Electricity generated by PVs (Appendix M) (negative quantity)														
(233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)	
Electricity generated by wind turbines (Appendix M) (negative quantity)														
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)	
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)														
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)	
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)														
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)	
Annual totals kWh/year														
Space heating fuel - main system 1												12485.7149	(211)	
Space heating fuel - main system 2												0.0000	(213)	
Space heating fuel - secondary												0.0000	(215)	
Efficiency of water heater												87.3000		
Water heating fuel used												2783.6375	(219)	
Space cooling fuel												0.0000	(221)	
Electricity for pumps and fans:														
central heating pump												41.0000	(230c)	
main heating flue fan												45.0000	(230e)	
Total electricity for the above, kWh/year												86.0000	(231)	
Electricity for lighting (calculated in Appendix L)												305.0918	(232)	
Energy saving/generation technologies (Appendices M ,N and Q)														
PV generation												0.0000	(233)	
Wind generation												0.0000	(234)	
Hydro-electric generation (Appendix N)												0.0000	(235a)	
Electricity generated - Micro CHP (Appendix N)												0.0000	(235)	
Appendix Q - special features														
Energy saved or generated												-0.0000	(236)	
Energy used												0.0000	(237)	
Total delivered energy for all uses												15660.4443	(238)	

10a. Fuel costs - using BEDF prices (589)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	12485.7149	6.5500	817.8143 (240)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2783.6375	6.5500	182.3283 (247)
Energy for instantaneous electric shower(s)	0.0000	28.4300	0.0000 (247a)
Pumps, fans and electric keep-hot	86.0000	28.4300	24.4498 (249)
Energy for lighting	305.0918	28.4300	86.7376 (250)
Additional standing charges			104.0000 (251)
Total energy cost			1215.3300 (255)

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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	12485.7149	0.2100	2622.0001 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	2783.6375	0.2100	584.5639 (264)
Space and water heating			3206.5640 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	305.0918	0.1443	44.0342 (268)
Total CO2, kg/year			3262.5275 (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	12485.7149	1.1300	14108.8579 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2783.6375	1.1300	3145.5104 (278)
Space and water heating			17254.3683 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	305.0918	1.5338	467.9601 (282)
Total Primary energy kWh/year			17852.4291 (286)

SAP 10 EPC IMPROVEMENTS

00001

Current energy efficiency rating: C 77
Current environmental impact rating: C 75

N Solar water heating SAP increase too small
U Solar photovoltaic panels Recommended
V2 Wind turbine Not applicable

Recommended measures:	SAP change	Cost change	CO2 change
U Solar photovoltaic panels	+ 4.1	-£ 254	-120 kg (3.7%)

Measures omitted - SAP change or cost saving too small:			
N Solar water heating	+ 0.4	-£ 28	-153 kg (4.7%)

Recommended measures	Typical annual savings	Energy efficiency	Environmental impact
Solar photovoltaic panels	£254	0.77 kg/m²	B 81 C 76
Total Savings	£254	0.77 kg/m²	

Potential energy efficiency rating: B 81
Potential environmental impact rating: C 76

Fuel prices for cost data on this page from database revision number 589 TEST (12 Dec 2025)
Recommendation texts revision number 6.1 (11 Jun 2019)

Typical heating and lighting costs of this home (per year, Thames Valley):

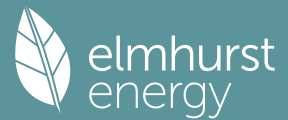
	Current	Potential	Saving
Electricity	£111	£111	£0
Mains gas	£1104	£1104	£0
Space heating	£946	£946	£0
Water heating	£182	£182	£0
Lighting	£87	£87	£0
Generated (PV)	-£0	-£254	£254
Total cost of fuels	£1215	£961	£254
Total cost of uses	£1215	£961	£254
Delivered energy	101 kWh/m²	95 kWh/m²	6 kWh/m²
Carbon dioxide emissions	3.3 tonnes	3.1 tonnes	0.1 tonnes
CO2 emissions per m²	21 kg/m²	20 kg/m²	1 kg/m²
Primary energy	115 kWh/m²	106 kWh/m²	9 kWh/m²

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF ENERGY RATING FOR IMPROVED DWELLING

1. Overall dwelling characteristics

	Area (m²)	Storey height (m)	Volume (m³)
Main dwelling			
Ground floor	61.6000 (1b)	x 2.4000 (2b)	= 147.8400 (1b) - (3b)
First floor	60.7000 (1c)	x 2.6500 (2c)	= 160.8550 (1c) - (3c)
Second floor	33.0000 (1d)	x 2.4600 (2d)	= 81.1800 (1d) - (3d)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	155.3000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 389.8750 (5)

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2. Ventilation rate

												m3 per hour	
Number of open chimneys												0 * 80 =	0.0000 (6a)
Number of open flues												0 * 20 =	0.0000 (6b)
Number of chimneys / flues attached to closed fire												0 * 10 =	0.0000 (6c)
Number of flues attached to solid fuel boiler												0 * 20 =	0.0000 (6d)
Number of flues attached to other heater												0 * 35 =	0.0000 (6e)
Number of blocked chimneys												0 * 20 =	0.0000 (6f)
Number of intermittent extract fans												6 * 10 =	60.0000 (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)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =											60.0000 / (5) =	0.1539 (8)
Pressure test												No	
Pressure Test Method												Blower Door	
Measured/design AP50												15.0000	(17)
Infiltration rate												0.9039	(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) =	0.8361 (21)
Wind speed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Wind factor	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)	
Adj infilt rate	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)	
	1.0660	1.0451	1.0242	0.9197	0.8988	0.7943	0.7943	0.7734	0.8361	0.8988	0.9406	0.9824 (22b)	
Effective ac	1.0660	1.0451	1.0242	0.9229	0.9039	0.8155	0.8155	0.7991	0.8495	0.9039	0.9424	0.9826 (25)	

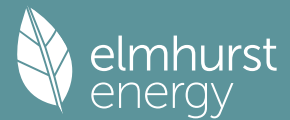
3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K					
Main dwelling												
Door			1.9100	1.4000	2.6740			(26)				
Windows			23.4500	1.3258	31.0890			(27)				
Roof windows			1.0900	1.3258	1.4451			(27a)				
Existing			36.8800	0.5700	21.0216	110.0000	4056.8000	(28a)				
New Floor			24.7200	0.1800	4.4496	75.0000	1854.0000	(28a)				
Existing	109.1400	10.7900	98.3500	0.3700	36.3895	190.0000	18686.5000	(29a)				
New wall	43.6000	13.7400	29.8600	0.1800	5.3748	190.0000	5673.4000	(29a)				
Dwarf wall	12.9000		12.9000	0.1800	2.3220	9.0000	116.1000	(29a)				
Dormer Wall	4.2000	0.8300	3.3700	0.1800	0.6066	9.0000	30.3300	(29a)				
Loft	28.6000		28.6000	0.1100	3.1460	9.0000	257.4000	(30)				
Slope	42.8900	1.0900	41.8000	0.1500	6.2700	9.0000	376.2000	(30)				
Total net area of external elements Aum(A, m2)			302.9300					(31)				
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 114.7882			(33)				
Main dwelling												
Party Wall 1			52.5300	0.0000	0.0000	180.0000	9455.4000	(32)				
Internal Wall 1			58.2700			75.0000	4370.2500	(32c)				
Internal Wall 2			102.1300			9.0000	919.1700	(32c)				
Internal Wall 3			37.3900			75.0000	2804.2500	(32c)				
Internal Floor 1			33.0000			18.0000	594.0000	(32d)				
Internal Floor 2			60.7000			18.0000	1092.6000	(32d)				
Internal Ceiling 1			61.6000			9.0000	554.4000	(32e)				
Internal Ceiling 2			60.7000			9.0000	546.3000	(32e)				
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 51387.1000	(34)				
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							330.8892	(35)				
Thermal bridges (Default value 0.200 * total exposed area)							60.5860	(36)				
Point Thermal bridges						(36a) =	0.0000					
Total fabric heat loss						(33) + (36) + (36a) =	175.3742	(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	137.1543	134.4650	131.7757	118.7439	116.2986	104.9154	104.9154	102.8074	109.3000	116.2986	121.2454	126.4170 (38)
Average = Sum(39)m / 12 =	312.5285	309.8392	307.1499	294.1181	291.6728	280.2896	280.2896	278.1816	284.6742	291.6728	296.6196	301.7912 (39)
												294.0689
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	2.0124	1.9951	1.9778	1.8939	1.8781	1.8048	1.8048	1.7913	1.8331	1.8781	1.9100	1.9433 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31
												1.8936
												31

4. Water heating energy requirements (kWh/year)

Assumed occupancy													2.9422 (42)
Hot water usage for mixer showers													
	73.5505	72.4452	70.8345	67.7528	65.4786	62.9424	61.5008	63.0993	64.8515	67.5746	70.7225	73.2687	(42a)
Hot water usage for baths													
	31.7524	31.2808	30.6167	29.3923	28.4755	27.4589	26.9097	27.5691	28.2871	29.3750	30.6246	31.6450	(42b)
Hot water usage for other uses													
	44.7609	43.1332	41.5055	39.8779	38.2502	36.6225	36.6225	38.2502	39.8779	41.5055	43.1332	44.7609	(42c)
Average daily hot water use (litres/day)													137.9422 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Energy conte	150.0637	146.8592	142.9568	137.0230	132.2042	127.0237	125.0330	128.9186	133.0165	138.4551	144.4803	149.6746	(44)
Energy content (annual)	237.6643	209.1255	219.7192	187.5776	177.9723	156.1905	151.2166	159.6281	164.0226	187.8822	205.8387	234.3542	(45)
Distribution loss (46)m = 0.15 x (45)m													
	35.6496	31.3688	32.9579	28.1366	26.6958	23.4286	22.6825	23.9442	24.6034	28.1823	30.8758	35.1531	(46)
Water storage loss (or HIU loss):													
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(56)
If cylinder contains dedicated solar storage													
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(57)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(59)
Combi loss	14.3270	12.9272	14.2839	13.7630	14.1837	13.6877	14.1195	14.1397	13.7065	14.2075	13.8068	14.3190	(61)
Total heat required for water heating calculated for each month													

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WWHRS	251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732 (62)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
Solar input	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000 (63b)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
Output from w/h	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)
	251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732 (64)
Electric shower(s)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)
Heat gains from water heating, kWh/month	82.6051	72.7660	76.6276	65.8103	62.7217	55.3553	53.8094	56.6113	57.9641	66.0227	71.8931	81.5025 (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	
(66m)	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	43.1889	38.3600	31.1965	23.6177	17.6545	14.9047	16.1050	20.9339	28.0975	35.6762	41.6394	44.3893	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	486.9109	491.9635	479.2311	452.1253	417.9091	385.7507	364.2669	359.2143	371.9467	399.0525	433.2687	465.4271	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	(71)
Water heating gains (Table 5)	111.0284	108.2828	102.9941	91.4032	84.3034	76.8823	72.3245	76.0904	80.5057	88.7402	99.8515	109.5464	(72)
Total internal gains	758.5670	756.0452	730.8605	684.5850	637.3058	591.9765	567.1352	570.6775	594.9888	640.9078	692.1984	736.8016	(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
East					14.5700	19.6403		0.6300	0.7000	0.7700		87.4538 (76)
West					8.8800	19.6403		0.6300	0.7000	0.7700		53.3006 (80)
East					1.0900	25.9973		0.6300	0.7000	1.0000		11.2470 (82)
Solar gains	152.0014	297.8620	491.8512	719.4529	883.6330	905.4127	861.6371	738.8439	572.7273	353.7810	189.6195	124.9405 (83)
Total gains	910.5684	1053.9072	1222.7117	1404.0379	1520.9388	1497.3892	1428.7723	1309.5213	1167.7161	994.6887	881.8179	861.7421 (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	45.6733	46.0697	46.4731	48.5322	48.9391	50.9266	50.9266	51.3125	50.1422	48.9391	48.1229	47.2982	
alpha	4.0449	4.0713	4.0982	4.2355	4.2626	4.3951	4.3951	4.4208	4.3428	4.2626	4.2082	4.1532	
util living area	0.9993	0.9986	0.9964	0.9881	0.9608	0.8800	0.7503	0.8060	0.9548	0.9942	0.9988	0.9995 (86)	
MIT	18.8947	19.0728	19.4122	19.9227	20.3780	20.7610	20.9190	20.8873	20.5753	19.9836	19.3948	18.9253 (87)	
Th 2	19.3251	19.3366	19.3482	19.4050	19.4158	19.4666	19.4666	19.4761	19.4469	19.4158	19.3940	19.3714 (88)	
util rest of house	0.9989	0.9979	0.9943	0.9804	0.9301	0.7748	0.5418	0.6151	0.9028	0.9892	0.9981	0.9992 (89)	
MIT 2	17.4753	17.6614	18.0082	18.5550	19.0003	19.3643	19.4519	19.4509	19.2129	18.6267	18.0243	17.5389 (90)	
Living area fraction	17.7188	17.9035	18.2490	18.7896	19.2366	19.6039	19.7036	19.6973	19.4466	18.8594	18.2594	17.7767 (92)	
MIT	17.7188	17.9035	18.2490	18.7896	19.2366	19.6039	19.7036	19.6973	19.4466	18.8594	18.2594	17.7767 (93)	
Temperature adjustment												0.0000	
adjusted MIT	17.7188	17.9035	18.2490	18.7896	19.2366	19.6039	19.7036	19.6973	19.4466	18.8594	18.2594	17.7767 (93)	

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	0.9984	0.9969	0.9921	0.9758	0.9251	0.7870	0.5800	0.6496	0.9027	0.9863	0.9972	0.9988 (94)	
Useful gains	909.0884	1050.5922	1213.0930	1370.0725	1407.0540	1178.5155	828.6277	850.6402	1054.1512	981.1044	879.3415	860.6932 (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	4193.7596	4028.9825	3608.7150	2908.7177	2198.2173	1402.5298	869.8981	917.2415	1522.0409	2409.0461	3310.1043	4097.3273 (97)	
Space heating kWh	2443.7953	2001.4783	1782.3428	1107.8246	588.6255	0.0000	0.0000	0.0000	0.0000	1062.3887	1750.1493	2408.0558 (98a)	
Space heating requirement - total per year (kWh/year)												13144.6602	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (98b)	
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	2443.7953	2001.4783	1782.3428	1107.8246	588.6255	0.0000	0.0000	0.0000	0.0000	1062.3887	1750.1493	2408.0558 (98c)	
Space heating requirement after solar contribution - total per year (kWh/year)												13144.6602	
Space heating per m2												84.6404 (99)	

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

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													89.0000 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	

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Space heating requirement	2443.7953	2001.4783	1782.3428	1107.8246	588.6255	0.0000	0.0000	0.0000	0.0000	1062.3887	1750.1493	2408.0558	(98)
Space heating efficiency (main heating system 1)	89.0000	89.0000	89.0000	89.0000	89.0000	0.0000	0.0000	0.0000	0.0000	89.0000	89.0000	89.0000	(210)
Space heating fuel (main heating system)	2745.8375	2248.8520	2002.6324	1244.7467	661.3769	0.0000	0.0000	0.0000	0.0000	1193.6952	1966.4598	2705.6806	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating requirement	251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732	(64)
Efficiency of water heater	88.8383	88.8273	88.7993	88.7343	88.5755	87.3000	87.3000	87.3000	87.3000	88.7239	88.8072	88.8381	(216)
Fuel for water heating, kWh/month	283.6516	249.9826	263.5190	226.9029	216.9403	194.5912	189.3884	199.0468	203.5843	227.7738	247.3286	279.9174	(219)
Space cooling fuel requirement	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.3041	7.0685	7.3041	7.0685	7.3041	(231)
Lighting	37.8030	30.3270	27.3061	20.0056	15.4529	12.6252	14.0967	18.3234	23.8002	31.2272	35.2710	38.8537	(232)
Electricity generated by PVs (Appendix M) (negative quantity)	-35.5085	-52.1866	-78.2516	-91.7976	-102.1217	-96.3769	-95.0697	-88.1227	-76.4401	-61.2259	-39.7413	-30.4409	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1												14769.2811	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												87.3000	
Water heating fuel used												2782.6268	(219)
Space cooling fuel												0.0000	(221)
Electricity for pumps and fans:													
central heating pump												41.0000	(230c)
main heating flue fan												45.0000	(230e)
Total electricity for the above, kWh/year												86.0000	(231)
Electricity for lighting (calculated in Appendix L)												305.0918	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation												-847.2833	(233)
Wind generation												0.0000	(234)
Hydro-electric generation (Appendix N)												0.0000	(235a)
Electricity generated - Micro CHP (Appendix N)												0.0000	(235)
Appendix Q - special features													
Energy saved or generated												-0.0000	(236)
Energy used												0.0000	(237)
Total delivered energy for all uses												17095.7164	(238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	14769.2811	3.6400	537.6018 (240)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2782.6268	3.6400	101.2876 (247)
Energy for instantaneous electric shower(s)	0.0000	16.4900	0.0000 (247a)
Pumps, fans and electric keep-hot	86.0000	16.4900	14.1814 (249)
Energy for lighting	305.0918	16.4900	50.3096 (250)
Additional standing charges			92.0000 (251)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-847.2833	16.4900	-139.7170
PV Unit electricity exported	0.0000	5.5900	0.0000
Total			-139.7170 (252)
Total energy cost			655.6635 (255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):		0.3600 (256)
Energy cost factor (ECF)		1.1784 (257)
SAP value		80.8977
SAP rating (Section 12)		81 (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	14769.2811	0.2100	3101.5490 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	2782.6268	0.2100	584.3516 (264)
Space and water heating			3685.9007 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	305.0918	0.1443	44.0342 (268)
Energy saving/generation technologies			

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PV Unit electricity used in dwelling	-847.2833	0.1337	-113.3203
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-113.3203 (269)
Total CO2, kg/year			3628.5438 (272)
CO2 emissions per m2			23.3600 (273)
EI value			75.7252
EI rating			76 (274)
EI band			C

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY FOR IMPROVED DWELLING

1. Overall dwelling characteristics

Main dwelling	Area (m2)	Storey height (m)	Volume (m3)
Ground floor	61.6000 (1b)	x 2.4000 (2b)	= 147.8400 (1b) - (3b)
First floor	60.7000 (1c)	x 2.6500 (2c)	= 160.8550 (1c) - (3c)
Second floor	33.0000 (1d)	x 2.4600 (2d)	= 81.1800 (1d) - (3d)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	155.3000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	389.8750 (5)

2. Ventilation rate

	m3 per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	6 * 10 = 60.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	60.0000 / (5) = 0.1539 (8)
Pressure test	No
Pressure Test Method	Blower Door
Measured/design AP50	15.0000 (17)
Infiltration rate	0.9039 (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) = 0.8361 (21)

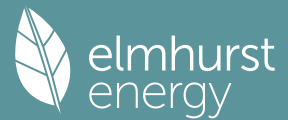
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	4.4000	4.1000	4.1000	3.9000	3.9000	3.4000	3.4000	3.3000	3.4000	3.8000	3.7000	4.0000 (22)
Wind factor	1.1000	1.0250	1.0250	0.9750	0.9750	0.8500	0.8500	0.8250	0.8500	0.9500	0.9250	1.0000 (22a)
Adj infilt rate	0.9197	0.8570	0.8570	0.8152	0.8152	0.7107	0.7107	0.6898	0.7107	0.7943	0.7734	0.8361 (22b)
Effective ac	0.9229	0.8672	0.8672	0.8323	0.8323	0.7525	0.7525	0.7379	0.7525	0.8155	0.7991	0.8495 (25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K
Main dwelling							
Door			1.9100	1.4000	2.6740		(26)
Windows			23.4500	1.3258	31.0890		(27)
Roof windows			1.0900	1.3258	1.4451		(27a)
Existing			36.8800	0.5700	21.0216	110.0000	4056.8000 (28a)
New Floor			24.7200	0.1800	4.4496	75.0000	1854.0000 (28a)
Existing	109.1400	10.7900	98.3500	0.3700	36.3895	190.0000	18686.5000 (29a)
New wall	43.6000	13.7400	29.8600	0.1800	5.3748	190.0000	5673.4000 (29a)
Dwarf wall	12.9000		12.9000	0.1800	2.3220	9.0000	116.1000 (29a)
Dormer Wall	4.2000	0.8300	3.3700	0.1800	0.6066	9.0000	30.3300 (29a)
Loft	28.6000		28.6000	0.1100	3.1460	9.0000	257.4000 (30)
Slope	42.8900	1.0900	41.8000	0.1500	6.2700	9.0000	376.2000 (30)
Total net area of external elements Aum(A, m2)			302.9300				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		114.7882		(33)
Main dwelling							
Party Wall 1			52.5300	0.0000	0.0000	180.0000	9455.4000 (32)
Internal Wall 1			58.2700			75.0000	4370.2500 (32c)
Internal Wall 2			102.1300			9.0000	919.1700 (32c)
Internal Wall 3			37.3900			75.0000	2804.2500 (32c)
Internal Floor 1			33.0000			18.0000	594.0000 (32d)
Internal Floor 2			60.7000			18.0000	1092.6000 (32d)
Internal Ceiling 1			61.6000			9.0000	554.4000 (32e)
Internal Ceiling 2			60.7000			9.0000	546.3000 (32e)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 51387.1000 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							330.8892 (35)
Thermal bridges (Default value 0.200 * total exposed area)							60.5860 (36)
Point Thermal bridges							(36a) = 0.0000
Total fabric heat loss							(33) + (36) + (36a) = 175.3742 (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	118.7439	111.5767	111.5767	107.0796	107.0796	96.8207	96.8207	94.9375	96.8207	104.9154	102.8074	109.3000 (38)
Heat transfer coeff												

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Average = Sum(39)m / 12 =	294.1181	286.9509	286.9509	282.4538	282.4538	272.1949	272.1949	270.3117	272.1949	280.2896	278.1816	284.6742 (39)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.8939	1.8477	1.8477	1.8188	1.8188	1.7527	1.7527	1.7406	1.7527	1.8048	1.7913	1.8331 (40)
HLP (average)												1.8046
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy													2.9422 (42)
Hot water usage for mixer showers													
73.5505	72.4452	70.8345	67.7528	65.4786	62.9424	61.5008	63.0993	64.8515	67.5746	70.7225	73.2687	(42a)	
Hot water usage for baths													
31.7524	31.2808	30.6167	29.3923	28.4755	27.4589	26.9097	27.5691	28.2871	29.3750	30.6246	31.6450	(42b)	
Hot water usage for other uses													
44.7609	43.1332	41.5055	39.8779	38.2502	36.6225	36.6225	38.2502	39.8779	41.5055	43.1332	44.7609	(42c)	
Average daily hot water use (litres/day)												137.9422 (43)	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	150.0637	146.8592	142.9568	137.0230	132.2042	127.0237	125.0330	128.9186	133.0165	138.4551	144.4803	149.6746 (44)	
Energy content (annual)	237.6643	209.1255	219.7192	187.5776	177.9723	156.1905	151.2166	159.6281	164.0226	187.8822	205.8387	234.3542 (45)	
Distribution loss (46)m = 0.15 x (45)m										Total = Sum(45)m =		2291.1919	
35.6496	31.3688	32.9579	28.1366	26.6958	23.4286	22.6825	23.9442	24.6034	28.1823	30.8758	35.1531	(46)	
Water storage loss (or HIU loss):													
Total storage loss													
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(56)	
If cylinder contains dedicated solar storage													
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(57)	
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(59)	
Combi loss	14.3270	12.9272	14.2839	13.7630	14.1837	13.6877	14.1195	14.1397	13.7065	14.2075	13.8068	(61)	
Total heat required for water heating calculated for each month													
251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732	(62)	
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63a)	
PV diverter	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	(63b)	
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63c)	
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63d)	
Output from w/h													
251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732	(64)	
Electric shower(s)													
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(64a)	
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000 (64a)	
Heat gains from water heating, kWh/month													
82.6051	72.7660	76.6276	65.8103	62.7217	55.3553	53.8094	56.6113	57.9641	66.0227	71.8931	81.5025	(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	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308	176.5308 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	43.1889	38.3600	31.1965	23.6177	17.6545	14.9047	16.1050	20.9339	28.0975	35.6762	41.6394	44.3893 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	486.9109	491.9635	479.2311	452.1253	417.9091	385.7507	364.2669	359.2143	371.9467	399.0525	433.2687	465.4271 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953	55.5953 (69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872	-117.6872 (71)
Water heating gains (Table 5)	111.0284	108.2828	102.9941	91.4032	84.3034	76.8823	72.3245	76.0904	80.5057	88.7402	99.8515	109.5464 (72)
Total internal gains	758.5670	756.0452	730.8605	684.5850	637.3058	591.9765	567.1352	570.6775	594.9888	640.9078	692.1984	736.8016 (73)

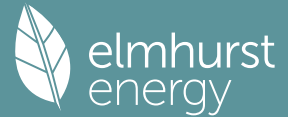
6. Solar gains

[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	
East					14.5700	23.7835	0.6300		0.7000		0.7700		105.9027 (76)	
West					8.8800	23.7835	0.6300		0.7000		0.7700		64.5447 (80)	
East					1.0900	31.6691	0.6300		0.7000		1.0000		13.7007 (82)	
Solar gains	184.1480	315.2224	515.8801	764.1875	912.8307	988.7492	931.9097	815.7345	639.7269	401.6508	226.2976	152.2318 (83)		
Total gains	942.7151	1071.2675	1246.7406	1448.7725	1550.1365	1580.7257	1499.0450	1386.4120	1234.7156	1042.5586	918.4961	889.0334 (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	48.5322	49.7444	49.7444	50.5364	50.5364	52.4411	52.4411	52.8064	52.4411	50.9266	51.3125	50.1422
alpha	4.2355	4.3163	4.3163	4.3691	4.3691	4.4961	4.4961	4.5204	4.4961	4.3951	4.4208	4.3428
util living area												
	0.9991	0.9984	0.9952	0.9824	0.9376	0.7871	0.5883	0.6527	0.9197	0.9905	0.9984	0.9993 (86)
MIT	19.1180	19.3138	19.6570	20.1139	20.5536	20.8859	20.9780	20.9655	20.7210	20.1676	19.6145	19.1522 (87)
Th 2	19.4050	19.4368	19.4368	19.4569	19.4569	19.5033	19.5033	19.5119	19.5033	19.4666	19.4761	19.4469 (88)
util rest of house												
	0.9987	0.9975	0.9923	0.9705	0.8875	0.6305	0.3437	0.4073	0.8325	0.9818	0.9973	0.9990 (89)
MIT 2	17.7555	17.9740	18.3160	18.7805	19.1899	19.4700	19.5018	19.5088	19.3758	18.8455	18.3034	17.8201 (90)
Living area fraction												
									fLA = Living area / (4) =			0.1715 (91)
MIT	17.9892	18.2038	18.5460	19.0093	19.4239	19.7129	19.7551	19.7587	19.6065	19.0723	18.5283	18.0486 (92)

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Temperature adjustment												0.0000
adjusted MIT	17.9892	18.2038	18.5460	19.0093	19.4239	19.7129	19.7551	19.7587	19.6065	19.0723	18.5283	18.0486 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9980	0.9964	0.9898	0.9654	0.8860	0.6567	0.3878	0.4524	0.8409	0.9782	0.9962	0.9985	(94)
Useful gains	940.8762	1067.4319	1234.0430	1398.6148	1373.4338	1038.0264	581.3094	627.1506	1038.2811	1019.8105	915.0162	887.7149	(95)
Ext temp.	4.9000	5.5000	7.3000	9.7000	12.7000	15.6000	17.6000	17.4000	14.8000	11.4000	7.8000	4.9000	(96)
Heat loss rate W	3849.7814	3645.3707	3227.0528	2629.4374	1899.1788	1119.5165	586.5963	637.5740	1308.3133	2150.4530	2984.4084	3743.0638	(97)
Space heating kWh	2164.2255	1732.3749	1482.7993	886.1923	391.1543	0.0000	0.0000	0.0000	0.0000	841.1980	1489.9624	2124.3796	(98a)
Space heating requirement - total per year (kWh/year)												11112.2863	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	2164.2255	1732.3749	1482.7993	886.1923	391.1543	0.0000	0.0000	0.0000	0.0000	841.1980	1489.9624	2124.3796	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												11112.2863	
Space heating per m2										(98c) / (4) =		71.5537	(99)

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

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													89.0000 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	2164.2255	1732.3749	1482.7993	886.1923	391.1543	0.0000	0.0000	0.0000	0.0000	841.1980	1489.9624	2124.3796	(98)
Space heating efficiency (main heating system 1)	89.0000	89.0000	89.0000	89.0000	89.0000	0.0000	0.0000	0.0000	0.0000	89.0000	89.0000	89.0000	(210)
Space heating fuel (main heating system)	2431.7140	1946.4887	1666.0666	995.7217	439.4992	0.0000	0.0000	0.0000	0.0000	945.1663	1674.1150	2386.9434	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating requirement	251.9912	222.0527	234.0031	201.3406	192.1560	169.8782	165.3361	173.7678	177.7291	202.0897	219.6455	248.6732	(64)
Efficiency of water heater	88.8196	88.8035	88.7644	88.6803	88.4327	87.3000	87.3000	87.3000	87.3000	88.6656	88.7779	88.8188	(216)
Fuel for water heating, kWh/month	283.7112	250.0494	263.6227	227.0409	217.2906	194.5912	189.3884	199.0468	203.5843	227.9236	247.4101	279.9783	(219)
Space cooling fuel requirement	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.3041	7.0685	7.3041	7.0685	7.3041	(231)
Lighting	37.8030	30.3270	27.3061	20.0056	15.4529	12.6252	14.0967	18.3234	23.8002	31.2272	35.2710	38.8537	(232)
Electricity generated by PVs (Appendix M) (negative quantity)	-40.9844	-53.8694	-80.2313	-94.8613	-103.7645	-100.9063	-98.9991	-92.9287	-81.4003	-66.3292	-45.1030	-35.3733	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1												12485.7149	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												87.3000	
Water heating fuel used												2783.6375	(219)
Space cooling fuel												0.0000	(221)
Electricity for pumps and fans:													
central heating pump												41.0000	(230c)
main heating flue fan												45.0000	(230e)
Total electricity for the above, kWh/year												86.0000	(231)
Electricity for lighting (calculated in Appendix L)												305.0918	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation												-894.7509	(233)
Wind generation												0.0000	(234)
Hydro-electric generation (Appendix N)												0.0000	(235a)
Electricity generated - Micro CHP (Appendix N)												0.0000	(235)
Appendix Q - special features													
Energy saved or generated												-0.0000	(236)
Energy used												0.0000	(237)
Total delivered energy for all uses												14765.6934	(238)

10a. Fuel costs - using BEDF prices (589)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year	
Space heating - main system 1	12485.7149	6.5500	817.8143	(240)
Total CO2 associated with community systems			0.0000	(473)
Water heating (other fuel)	2783.6375	6.5500	182.3283	(247)

Full SAP Calculation Printout



Energy for instantaneous electric shower(s)	0.0000	28.4300	0.0000 (247a)
Pumps, fans and electric keep-hot	86.0000	28.4300	24.4498 (249)
Energy for lighting	305.0918	28.4300	86.7376 (250)
Additional standing charges			104.0000 (251)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-894.7509	28.4300	-254.3777
PV Unit electricity exported	0.0000	5.8100	0.0000
Total			-254.3777 (252)
Total energy cost			960.9523 (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	12485.7149	0.2100	2622.0001 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	2783.6375	0.2100	584.5639 (264)
Space and water heating			3206.5640 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	305.0918	0.1443	44.0342 (268)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-894.7509	0.1340	-119.8707
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-119.8707 (269)
Total CO2, kg/year			3142.6567 (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	12485.7149	1.1300	14108.8579 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2783.6375	1.1300	3145.5104 (278)
Space and water heating			17254.3683 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	305.0918	1.5338	467.9601 (282)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-894.7509	1.4951	-1337.7298
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-1337.7298 (283)
Total Primary energy kWh/year			16514.6994 (286)

Predicted Energy Assessment



Unit 1 , 9 , Circuit Lane , Reading , RG30 5HB

Dwelling type:

House, Semi-Detached

Date of assessment:

08/01/2026

SAP Version:

10.2

Produced by:

Matthew Carter

Total floor area:

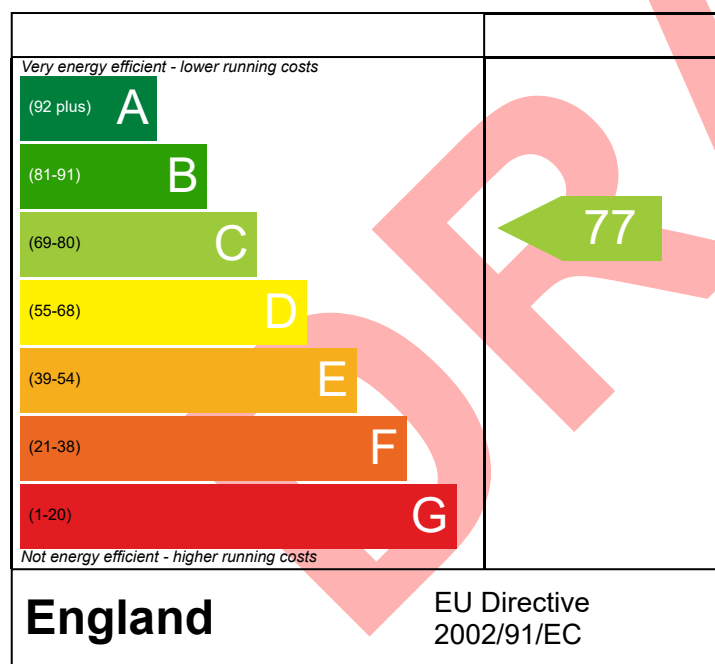
155.3 m²

DRRN:

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.

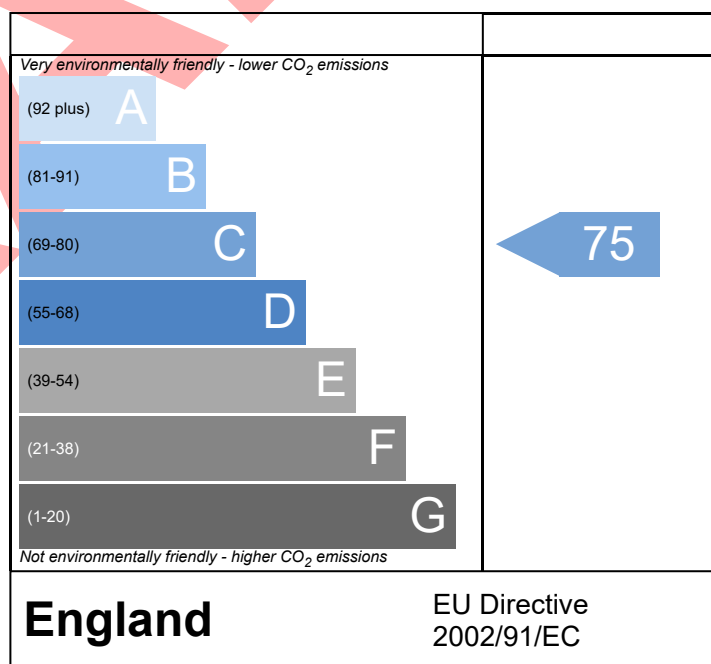
The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO₂) emissions.

Energy Efficiency Rating



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.

Environmental Impact (CO₂) Rating



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.

Summary for Input Data

Plot Reference	01773	Issued on Date	08/01/2026
Assessment Reference	00001	Plot Type Ref	
Plot Address	Unit 1 , 9 , Circuit Lane , Reading , RG30 5HB	SAP Version	10.2

SAP Rating	77 C	DER	24.50	TER	
Environmental	75 C	% DER < TER			N/A
CO ₂ Emissions (t/year)	3.26	DFEE	86.08	TFEE	
Compliance Check	N/A	% DFEE < TFEE			
% DPER < TPER		DPER	133.73	TPER	

Assessor Details	Mr. Matthew Carter	Assessor ID	7869-0001
Client	Simon Knight, Simon Knight		

SUMMARY FOR INPUT DATA FOR: Conversion (As Designed)

Orientation	West
Property Tenture	ND
Transaction Type	6
Terrain Type	Suburban
1.0 Property Type	House, Semi-Detached
2.0 Number of Storeys	3
3.0 Date Built	2026
4.0 Sheltered Sides	1
5.0 Sunlight/Shade	Average or unknown
6.0 Thermal Mass Parameter	Precise calculation
Thermal Mass	330.89 kJ/m²K

7.0 Electricity Tariff	Standard
Smart electricity meter fitted	No
Smart gas meter fitted	No

7.0 Measurements	Ground floor:	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
	1st Storey:	26.24 m	61.60 m²	2.40 m
	2nd Storey:	25.80 m	60.70 m²	2.65 m
		20.88 m	33.00 m²	2.46 m

8.0 Living Area	26.64 m²
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9.0 External Walls	Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Res	Shelter	Openings	Area Calculation Type
	Existing	Cavity Wall	Cavity wall : dense plaster, dense block, filled cavity, any outside structure	0.37	190.00	109.14	98.35	0.00	None	10.79	Enter Gross Area
	New wall	Cavity Wall	Cavity wall : dense plaster, dense block, filled cavity, any outside structure	0.18	190.00	43.60	29.86	0.00	None	13.74	Enter Gross Area
	Dwarf wall	Timber Frame	Timber framed wall (one layer of plasterboard)	0.18	9.00	12.90	12.90	0.00	None	0.00	Enter Gross Area
	Dormer Wall	Timber Frame	Timber framed wall (one layer of plasterboard)	0.18	9.00	4.20	3.37	0.00	None	0.83	Enter Gross Area

9.1 Party Walls	Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)	Shelter Res	Shelter
	Party Wall 1	Filled Cavity with Edge Sealing	Dense plaster both sides, dense blocks, cavity or cavity fill	0.00	180.00	52.53		None

9.2 Internal Walls	Description	Construction	Kappa (kJ/m²K)	Area (m²)
	Internal Wall 1	Dense block, plasterboard on dabs	75.00	58.27
	Internal Wall 2	Plasterboard on timber frame	9.00	102.13
	Internal Wall 3	Dense block, plasterboard on dabs	75.00	37.39

10.0 External Roofs	Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Code	Shelter Factor	Calculation Type	Openings
	Loft	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	28.60	28.60	None	0.00	Enter Gross Area	0.00
	Slope	External Slope Roof	Plasterboard, insulated slope	0.15	9.00	42.89	41.80	None	0.00	Enter Gross Area	1.09

Summary for Input Data

10.2 Internal Ceilings

Description	Storey	Construction	Kappa	Area (m²)
Internal Ceiling 1	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	9.00	61.60
Internal Ceiling 2	+1	Plasterboard ceiling, carpeted chipboard floor	9.00	60.70

11.0 Heat Loss Floors

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Existing	Ground Floor - Solid	Lowest occupied	Slab on ground, screed over insulation	0.57	None	0.00	110.00	36.88
New Floor	Ground Floor - Solid	Lowest occupied	Suspended concrete floor, carpeted	0.18	None	0.00	75.00	24.72

11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor 1	+2	Plasterboard ceiling, carpeted chipboard floor	18.00	33.00
Internal Floor 2	+1	Plasterboard ceiling, carpeted chipboard floor	18.00	60.70

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Door	Manufacturer	Solid Door				0.00			1.40
Windows	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.40
Roof windows	Manufacturer	Roof Window	Double Low-E Soft 0.05			0.63		0.70	1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Opening	Door	Existing	West	1.91	
Opening	Windows	Existing	West	8.88	
Opening	Windows	New wall	East	13.74	
Opening	Windows	Dormer Wall	East	0.83	
Opening	Roof windows	Slope	East	1.09	44

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

Y-value

 W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys

Number of open flues

Number of chimneys/flues attached to closed fire

Number of flues attached to solid fuel boiler

Number of flues attached to other heater

Number of blocked chimneys

Number of intermittent extract fans

Number of passive vents

Number of flueless gas fires

21.0 Fixed Cooling System

22.0 Pressure Testing

22.0 Lighting

No Fixed Lighting

Name	Efficacy	Power	Capacity	Count
Lighting 1	84.00	7.00	588.00	24

24.0 Main Heating 1

Percentage of Heat %

Database Ref. No.

Fuel Type

In Winter

Summary for Input Data

In Summer	87.30				
Model Name	LOGIC COMBI				
Manufacturer	Ideal Boilers				
System Type	Combi boiler				
Controls SAP Code	2106				
Controls description	Programmer, room thermostat and TRVs				
Delayed Start Stat	No				
Flue Type	Balanced				
Fan Assisted Flue	Yes				
Is MHS Pumped	Pump in heated space				
Heating Pump Age	2013 or later				
Heat Emitter	Radiators				
Flow Temperature	Unknown				
Boiler Interlock	Yes				
Combi boiler type	Standard Combi				
Combi keep hot type	None				
25.0 Main Heating 2	None				
26.0 Heat Networks	None				
27.0 Secondary Heating	None				
28.0 Water Heating					
Water Heating	Main Heating 1				
SAP Code	901				
Flue Gas Heat Recovery System	No				
Waste Water Heat Recovery Instantaneous System 1	No				
Waste Water Heat Recovery Instantaneous System 2	No				
Waste Water Heat Recovery Storage System	No				
Solar Panel	No				
Water use <= 125 litres/person/day	Yes				
Cold Water Source	From mains				
Bath Count	1				
28.1 Showers					
Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
Shower	Unknown	8.00		No	
28.3 Waste Water Heat Recovery System					
29.0 Hot Water Cylinder	None				

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement	
			SAP rating	Environmental Impact
Solar water heating			C 77	C 76
Photovoltaic	£8,000 - £10,000	£254	B 81	C 76
Wind turbine			0	0