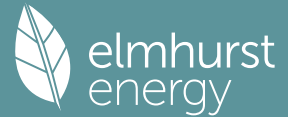


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Plot Reference	Land to the rear of 28 Sidney				Issued on Date	25/09/2026	
Assessment Reference	Be Green			Plot Type Ref			
Plot Address	Land to the rear of , 28 Sidney Road, London, N22 8LS				SAP Version	10.2	
SAP Rating	78 C	DER	6.12	TER	15.57		
Environmental	96 A	% DER < TER				60.69	
CO ₂ Emissions (t/year)	0.32	DFEE	53.84	TFEE	58.25		
Compliance Check	See BREL	% DFEE < TFEE				7.56	
% DPER < TPER	21.59	DPER	64.37	TPER	82.10		
Assessor Details	Mr. Liam Rushton				Assessor ID	AK74-0001	
Client	Crawford Partnership, Crawford Partnership						

SAP 10 WORKSHEET FOR New Build (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	38.1500 (1b)	x 2.7000 (2b)	= 103.0050 (1b) - (3b)
First floor	19.1300 (1c)	x 2.4200 (2c)	= 46.2946 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	57.2800		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	149.2996 (5)

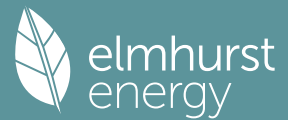
2. Ventilation rate

											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											0 * 10 =	0.0000 (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) =											0.0000 / (5) =	0.0000 (8)	
Pressure test											Yes		
Pressure Test Method											Blower Door		
Measured/design AP50											3.0000 (17)		
Infiltration rate											0.1500 (18)		
Number of sides sheltered											2 (19)		
Shelter factor											(20) = 1 - [0.075 x (19)] =	0.8500 (20)	
Infiltration rate adjusted to include shelter factor											(21) = (18) x (20) =	0.1275 (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)	
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)	
Adj infilt rate													
	0.1626	0.1594	0.1562	0.1403	0.1371	0.1211	0.1211	0.1179	0.1275	0.1371	0.1434	0.1498 (22b)	
Balanced mechanical ventilation with heat recovery													
If mechanical ventilation													0.5000 (23a)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)													0.5000 (23b)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =													80.1000 (23c)
Effective ac	0.2621	0.2589	0.2557	0.2397	0.2366	0.2206	0.2206	0.2174	0.2270	0.2366	0.2429	0.2493 (25)	

3. Heat losses and heat loss parameter

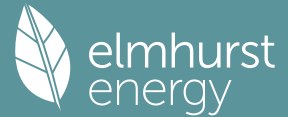
Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
Solid Door			1.6200	1.0000	1.6200		(26)
Glazed Door			4.7900	1.0536	5.0469		(27)
Window			7.4900	1.0536	7.8918		(27)
Rooflight			8.3800	0.8687	7.2799		(27a)
Ground Floor			38.1400	0.1000	3.8140	110.0000	4195.4000 (28a)
External Wall GF	67.7800	7.2100	60.5700	0.1600	9.6912	9.0000	545.1300 (29a)
External Wall Clad FF	46.3000	6.6900	39.6100	0.1600	6.3376	9.0000	356.4900 (29a)
Ground Floor Flat Roof	19.0200	5.2400	13.7800	0.1100	1.5158	9.0000	124.0200 (30)
First Floor Flat Roof	15.5600	3.1400	12.4200	0.1100	1.3662	9.0000	111.7800 (30)
First Floor Sloped Roof	5.7800		5.7800	0.1100	0.6358	9.0000	52.0200 (30)
Total net area of external elements Aum(A, m ²)			192.5800				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	45.1992		(33)
Main dwelling							
Internal Wall			91.0000			9.0000	819.0000 (32c)

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FF Internal Floor	19.1300										18.0000	344.3400 (32d)
Internal Ceiling GF	19.1300										9.0000	172.1700 (32e)
Heat capacity Cm = Sum(A x k)	(28)...(30) + (32) + (32a)...(32e) =										6720.3500 (34)	
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K											117.3245 (35)	
List of Thermal Bridges												
K1 Element	Length										Psi-value	Total
E2 Other lintels (including other steel lintels)	9.0800										0.1000	0.9080
E3 Sill	8.1800										0.0500	0.4090
E4 Jamb	30.8000										0.0500	1.5400
E5 Ground floor (normal)	27.1100										0.1600	4.3376
E6 Intermediate floor within a dwelling	8.5700										0.0200	0.1714
E16 Corner (normal)	28.3000										0.0900	2.5470
R11 Upstands or kerbs of rooflights	33.5600										0.0800	2.6848
E24 Eaves (insulation at ceiling level - inverted)	10.2400										0.1500	1.5360
E14 Flat roof	20.0800										0.0800	1.6064
E17 Corner (inverted - internal area greater than external area)	7.8200										-0.0900	-0.7038
E14 Flat roof	13.3300										0.0800	1.0664
E13 Gable (insulation at rafter level)	3.3600										0.0800	0.2688
E11 Eaves (insulation at rafter level)	3.4400										0.0400	0.1376
Thermal bridges (Sum(L x Psi) calculated using Appendix K)												16.5092 (36)
Point Thermal bridges											(36a) =	0.0000
Total fabric heat loss											(33) + (36) + (36a) =	61.7084 (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	12.9115	12.7545	12.5974	11.8122	11.6552	10.8699	10.8699	10.7129	11.1840	11.6552	11.9693	12.2833 (38)
Average = Sum(39)m / 12 =	74.6199	74.4629	74.3059	73.5206	73.3636	72.5784	72.5784	72.4213	72.8925	73.3636	73.6777	73.9918 (39)
												73.4814
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.3027	1.3000	1.2972	1.2835	1.2808	1.2671	1.2671	1.2643	1.2726	1.2808	1.2863	1.2918 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31
4. Water heating energy requirements (kWh/year)												
Assumed occupancy												1.9038 (42)
Hot water usage for mixer showers	76.5723	75.4215	73.7447	70.5364	68.1687	65.5283	64.0275	65.6916	67.5158	70.3508	73.6281	76.2789 (42a)
Hot water usage for baths	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42b)
Hot water usage for other uses	34.1266	32.8856	31.6447	30.4037	29.1627	27.9218	27.9218	29.1627	30.4037	31.6447	32.8856	34.1266 (42c)
Average daily hot water use (litres/day)												101.6213 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	110.6989	108.3072	105.3894	100.9401	97.3314	93.4501	91.9493	94.8544	97.9196	101.9955	106.5137	110.4055 (44)
Energy content (annual)	175.3200	154.2280	161.9795	138.1819	131.0268	114.9078	111.2047	117.4495	120.7446	138.4070	151.7484	172.8683 (45)
Distribution loss (46)m = 0.15 x (45)m	26.2980	23.1342	24.2969	20.7273	19.6540	17.2362	16.6807	17.6174	18.1117	20.7610	22.7623	25.9303 (46)
Water storage loss (or HIU loss):												150.0000 (47)
Store volume												1.5000 (48)
a) If manufacturer declared loss factor is known (kWh/day):												0.5400 (49)
Temperature factor from Table 2b												0.8100 (55)
Enter (49) or (54) in (55)												
Total storage loss	25.1100	22.6800	25.1100	24.3000	25.1100	24.3000	25.1100	25.1100	24.3000	25.1100	24.3000	25.1100 (56)
If cylinder contains dedicated solar storage	25.1100	22.6800	25.1100	24.3000	25.1100	24.3000	25.1100	25.1100	24.3000	25.1100	24.3000	25.1100 (57)
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624 (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	223.6924	197.9192	210.3519	184.9939	179.3992	161.7198	159.5771	165.8219	167.5566	186.7794	198.5604	221.2407 (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	223.6924	197.9192	210.3519	184.9939	179.3992	161.7198	159.5771	165.8219	167.5566	186.7794	198.5604	221.2407 (64)
12Total per year (kWh/year)											Total per year (kWh/year) = Sum(64)m =	2257.6125 (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	96.9918	86.2338	92.5561	83.3951	82.2643	75.6564	75.6735	77.7499	77.5972	84.7182	87.9059	96.1766 (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	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	83.7475	92.7204	83.7475	86.5391	83.7475	86.5391	83.7475	83.7475	86.5391	83.7475	86.5391	83.7475 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	166.0388	167.7617	163.4199	154.1767	142.5088	131.5427	124.2166	122.4936	126.8354	136.0786	147.7465	158.7127 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189 (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)	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512 (71)
Water heating gains (Table 5)	130.3653	128.3241	124.4034	115.8265	110.5703	105.0784	101.7117	104.5025	107.7739	113.8686	122.0916	129.2697 (72)
Total internal gains	434.7083	443.3629	426.1275	411.0990	391.3834	374.7168	361.2325	362.3004	372.7051	388.2514	410.9339	426.2866 (73)
6. Solar gains												

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[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		2.6400	19.6403	0.4500	0.7000	0.7700	11.3187 (76)
West		2.1500	19.6403	0.4500	0.7000	0.7700	9.2178 (80)
North		2.0400	10.6334	0.4500	0.7000	0.7700	4.7353 (74)
South		0.8500	46.7521	0.4500	0.7000	0.7700	8.6749 (78)
West		4.6000	19.6403	0.4500	0.7000	0.7700	19.7219 (80)
Horizontal		8.3800	26.0000	0.4000	0.7000	1.0000	54.9058 (82)

Solar gains	108.5743	216.0456	365.9001	551.0724	691.8612	715.7887	678.3437	571.4589	431.0881	258.9203	136.0099	88.8970 (83)
Total gains	543.2826	659.4086	792.0276	962.1714	1083.2446	1090.5055	1039.5762	933.7592	803.7932	647.1718	546.9437	515.1836 (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	25.0170	25.0697	25.1227	25.3910	25.4454	25.7207	25.7207	25.7764	25.6098	25.4454	25.3369	25.2293
alpha	2.6678	2.6713	2.6748	2.6927	2.6964	2.7147	2.7147	2.7184	2.7073	2.6964	2.6891	2.6820
util living area	0.9353	0.8974	0.8283	0.7000	0.5480	0.4008	0.2984	0.3425	0.5459	0.7864	0.9043	0.9426 (86)
MIT	19.1823	19.4834	19.9115	20.3848	20.6804	20.8231	20.8659	20.8563	20.7374	20.2963	19.6582	19.1322 (87)
Th 2	19.8387	19.8408	19.8430	19.8538	19.8559	19.8667	19.8667	19.8689	19.8624	19.8559	19.8516	19.8473 (88)
util rest of house	0.9250	0.8820	0.8037	0.6616	0.4962	0.3370	0.2249	0.2635	0.4752	0.7468	0.8871	0.9334 (89)
MIT 2	17.7462	18.1203	18.6434	19.2051	19.5288	19.6778	19.7120	19.7086	19.6036	19.1266	18.3536	17.6898 (90)
Living area fraction									fLA =	Living area /	(4) =	0.4850 (91)
MIT	18.4427	18.7814	19.2584	19.7772	20.0873	20.2333	20.2716	20.2652	20.1534	19.6939	18.9863	18.3894 (92)
Temperature adjustment												0.0000
adjusted MIT	18.4427	18.7814	19.2584	19.7772	20.0873	20.2333	20.2716	20.2652	20.1534	19.6939	18.9863	18.3894 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9095	0.8651	0.7896	0.6588	0.5071	0.3581	0.2516	0.2918	0.4942	0.7405	0.8715	0.9186 (94)
Useful gains	494.1402	570.4827	625.3835	633.8788	549.3207	390.5585	261.5266	272.4259	397.2449	479.2053	476.6568	473.2558 (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	1055.3271	1033.6497	948.0255	799.7014	615.3251	408.8557	266.4800	279.9241	441.2502	667.1611	875.7555	1049.8968 (97)
Space heating kWh	417.5231	311.2482	240.0457	119.3923	49.1073	0.0000	0.0000	0.0000	0.0000	139.8391	287.3511	429.0208 (98a)
Space heating requirement - total per year (kWh/year)												1993.5275
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	417.5231	311.2482	240.0457	119.3923	49.1073	0.0000	0.0000	0.0000	0.0000	139.8391	287.3511	429.0208 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1993.5275
Space heating per m2										(98c) / (4) =		34.8032 (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 %)												219.3000 (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	417.5231	311.2482	240.0457	119.3923	49.1073	0.0000	0.0000	0.0000	0.0000	139.8391	287.3511	429.0208 (98)
Space heating efficiency (main heating system 1)	219.3000	219.3000	219.3000	219.3000	219.3000	0.0000	0.0000	0.0000	0.0000	219.3000	219.3000	219.3000 (210)
Space heating fuel (main heating system)	190.3890	141.9280	109.4599	54.4424	22.3927	0.0000	0.0000	0.0000	0.0000	63.7661	131.0310	195.6319 (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	223.6924	197.9192	210.3519	184.9939	179.3992	161.7198	159.5771	165.8219	167.5566	186.7794	198.5604	221.2407 (64)
Efficiency of water heater	190.4000	190.4000	190.4000	190.4000	190.4000	190.4000	190.4000	190.4000	190.4000	190.4000	190.4000	190.4000 (216)
Fuel for water heating, kWh/month	117.4855	103.9492	110.4790	97.1607	94.2223	84.9368	83.8115	87.0913	88.0024	98.0984	104.2859	116.1979 (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	13.2113	11.9328	13.2113	12.7851	13.2113	12.7851	13.2113	13.2113	12.7851	13.2113	12.7851	13.2113 (231)
Lighting	17.4011	13.9598	12.5692	9.2088	7.1131	5.8115	6.4888	8.4344	10.9555	14.3742	16.2356	17.8847 (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)

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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												909.0412	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												190.4000	
Water heating fuel used												1185.7208	(219)
Space cooling fuel												0.0000	(221)

Electricity for pumps and fans: (BalancedWithHeatRecovery, Database: in-use factor = 1.4000, SFP = 0.8540) mechanical ventilation fans (SFP = 0.8540)												155.5523	(230a)
Total electricity for the above, kWh/year												155.5523	(231)
Electricity for lighting (calculated in Appendix L)												140.4366	(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												2390.7510	(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	909.0412	0.1557	141.5763	(261)
Total CO2 associated with community systems			0.0000	(373)
Water heating (other fuel)	1185.7208	0.1409	167.0314	(264)
Space and water heating			308.6077	(265)
Pumps, fans and electric keep-hot	155.5523	0.1387	21.5770	(267)
Energy for lighting	140.4366	0.1443	20.2693	(268)
Total CO2, kg/year			350.4541	(272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			6.1200	(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	909.0412	1.5766	1433.1669	(275)
Total CO2 associated with community systems			0.0000	(473)
Water heating (other fuel)	1185.7208	1.5209	1803.3407	(278)
Space and water heating			3236.5076	(279)
Pumps, fans and electric keep-hot	155.5523	1.5128	235.3195	(281)
Energy for lighting	140.4366	1.5338	215.4064	(282)
Total Primary energy kWh/year			3687.2335	(286)
Dwelling Primary energy Rate (DPER)			64.3700	(287)

SAP 10 WORKSHEET FOR New Build (As Designed) (Version 10.2, February 2022) CALCULATION OF TARGET EMISSIONS

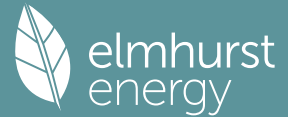
1. Overall dwelling characteristics

		Area	Storey height	Volume
		(m2)	(m)	(m3)
Main dwelling				
Ground floor		38.1500 (1b)	x 2.7000 (2b)	= 103.0050 (1b) - (3b)
First floor		19.1300 (1c)	x 2.4200 (2c)	= 46.2946 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)... (1n)	57.2800			(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)... (3n) =		149.2996 (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	2 * 10 =	20.0000 (7a)
Number of passive vents	0 * 10 =	0.0000 (7b)
Number of flueless gas fires	0 * 40 =	0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) =	0.1340 (8)
Pressure test		Yes
Pressure Test Method		Blower Door
Measured/design AP50		5.0000 (17)
Infiltration rate		0.3840 (18)
Number of sides sheltered		2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] =	0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =	0.3264 (21)

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Wind speed	Jan 5.1000	Feb 5.0000	Mar 4.9000	Apr 4.4000	May 4.3000	Jun 3.8000	Jul 3.8000	Aug 3.7000	Sep 4.0000	Oct 4.3000	Nov 4.5000	Dec 4.7000	(22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750	(22a)
Adj infilt rate													
Effective ac	0.4161	0.4080	0.3998	0.3590	0.3508	0.3100	0.3100	0.3019	0.3264	0.3508	0.3672	0.3835	(22b)
	0.5866	0.5832	0.5799	0.5644	0.5615	0.5481	0.5481	0.5456	0.5533	0.5615	0.5674	0.5735	(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								
TER Opaque door			1.6200	1.0000	1.6200			(26)
TER Opening Type			7.5400	1.1450	8.6336			(27)
TER Roof Light			5.1500	1.5918	10.4136			(27a)
Ground Floor			38.1400	0.1300	4.9582			(28a)
External Wall GF	67.7800	5.0500	62.7300	0.1800	11.2914			(29a)
External Wall Clad FF	46.3000	4.1100	42.1900	0.1800	7.5942			(29a)
Ground Floor Flat Roof	19.0200	3.2200	15.8000	0.1100	1.7380			(30)
First Floor Flat Roof	15.5600	1.9300	13.6300	0.1100	1.4993			(30)
First Floor Sloped Roof	5.7800		5.7800	0.1100	0.6358			(30)
Total net area of external elements Aum(A, m2)			192.5800					(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	48.3841		(33)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							117.3245	(35)

Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K

List of Thermal Bridges	Length	Psi-value	Total	
K1 Element	9.0800	0.0500	0.4540	
E2 Other lintels (including other steel lintels)	8.1800	0.0500	0.4090	
E3 Sill	30.8000	0.0500	1.5400	
E4 Jamb	27.1100	0.1600	4.3376	
E5 Ground floor (normal)	8.5700	0.0000	0.0000	
E6 Intermediate floor within a dwelling	28.3000	0.0900	2.5470	
E16 Corner (normal)	33.5600	0.0800	2.6848	
R11 Upstands or kerbs of rooflights	10.2400	0.2400	2.4576	
E24 Eaves (insulation at ceiling level - inverted)	20.0800	0.0800	1.6064	
E14 Flat roof	7.8200	-0.0900	-0.7038	
E17 Corner (inverted - internal area greater than external area)	13.3300	0.0800	1.0664	
E14 Flat roof	3.3600	0.0800	0.2688	
E13 Gable (insulation at rafter level)	3.4400	0.0400	0.1376	
E11 Eaves (insulation at rafter level)				

Thermal bridges (Sum(L x Psi) calculated using Appendix K)

Point Thermal bridges	(36a) =	0.0000	
Total fabric heat loss	(33) + (36) + (36a) =	65.1895	(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	28.8999	28.7343	28.5719	27.8094	27.6667	27.0025	27.0025	26.8795	27.2583	27.6667	27.9553	28.2571	(38)
Heat transfer coeff	94.0894	93.9238	93.7614	92.9989	92.8562	92.1920	92.1920	92.0690	92.4478	92.8562	93.1448	93.4466	(39)
Average = Sum(39)m / 12 =												92.9982	

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP	1.6426	1.6397	1.6369	1.6236	1.6211	1.6095	1.6095	1.6074	1.6140	1.6211	1.6261	1.6314	(40)
HLP (average)												1.6236	
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													1.9038	(42)
Hot water usage for mixer showers	72.0680	70.9850	69.4068	66.3872	64.1588	61.6737	60.2612	61.8274	63.5443	66.2126	69.2970	71.7919	(42a)	
Hot water usage for baths	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(42b)	
Hot water usage for other uses	34.1266	32.8856	31.6447	30.4037	29.1627	27.9218	27.9218	29.1627	30.4037	31.6447	32.8856	34.1266	(42c)	
Average daily hot water use (litres/day)												97.4685	(43)	
Daily hot water use	106.1946	103.8706	101.0515	96.7909	93.3215	89.5955	88.1829	90.9902	93.9480	97.8572	102.1827	105.9185	(44)	
Energy conte	168.1863	147.9104	155.3123	132.5019	125.6287	110.1681	106.6496	112.6648	115.8473	132.7913	145.5780	165.8428	(45)	
Energy content (annual)														
Distribution loss (46)m = 0.15 x (45)m	25.2280	22.1866	23.2968	19.8753	18.8443	16.5252	15.9974	16.8997	17.3771	19.9187	21.8367	24.8764	(46)	
Water storage loss (or HIU loss):														
Store volume												150.0000	(47)	
a) If manufacturer declared loss factor is known (kWh/day):												1.3938	(48)	
Temperature factor from Table 2b												0.5400	(49)	
Enter (49) or (54) in (55)												0.7527	(55)	
Total storage loss	23.3325	21.0745	23.3325	22.5798	23.3325	22.5798	23.3325	23.3325	22.5798	23.3325	22.5798	23.3325	(56)	
If cylinder contains dedicated solar storage	23.3325	21.0745	23.3325	22.5798	23.3325	22.5798	23.3325	23.3325	22.5798	23.3325	22.5798	23.3325	(57)	
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624	(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	214.7813	189.9961	201.9072	177.5937	172.2236	155.2599	153.2445	159.2597	160.9392	179.3863	190.6698	212.4377	(62)	
WWHRS	-32.9465	-29.1381	-30.5118	-25.2650	-23.5460	-20.1485	-18.8860	-20.0834	-20.8464	-24.5756	-27.8412	-32.3364	(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	181.8348	160.8580	171.3954	152.3287	148.6776	135.1114	134.3585	139.1763	140.0927	154.8106	162.8286	180.1013	(64)	
Total per year (kWh/year)												1861.5740	(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	93.1979	82.8488	88.9173	80.1303	79.0475	72.7044	72.7369	74.7370	74.5927	81.4290	84.4781	92.4187	(65)	

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

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Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890	95.1890 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	83.7475	92.7204	83.7475	86.5391	83.7475	86.5391	83.7475	83.7475	86.5391	83.7475	86.5391	83.7475 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	166.0388	167.7617	163.4199	154.1767	142.5088	131.5427	124.2166	122.4936	126.8354	136.0786	147.7465	158.7127 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189	32.5189 (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)	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512	-76.1512 (71)
Water heating gains (Table 5)	125.2660	123.2869	119.5125	111.2921	106.2466	100.9783	97.7647	100.4529	103.6010	109.4476	117.3308	124.2186 (72)
Total internal gains	429.6089	438.3257	421.2366	406.5646	387.0596	370.6167	357.2855	358.2508	368.5322	383.8305	406.1731	421.2355 (73)

6. Solar gains

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

North					1.2500	10.6334	0.6300		0.7000	0.7700			4.0621 (74)
East					1.6200	19.6403	0.6300		0.7000	0.7700			9.7238 (76)
South					0.5200	46.7521	0.6300		0.7000	0.7700			7.4298 (78)
West					4.1500	19.6403	0.6300		0.7000	0.7700			24.9096 (80)
Horizontal					5.1500	26.0000	0.6300		0.7000	1.0000			53.1449 (82)

Solar gains	99.2702	198.0591	336.4935	508.0374	638.6787	661.0791	626.3728	527.1664	396.8819	237.6629	124.4549	81.2120 (83)	
Total gains	528.8791	636.3849	757.7300	914.6020	1025.7383	1031.6958	983.6583	885.4172	765.4141	621.4933	530.6280	502.4475 (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	19.8403	19.8753	19.9097	20.0730	20.1038	20.2487	20.2487	20.2757	20.1926	20.1038	20.0415	19.9768
alpha	2.3227	2.3250	2.3273	2.3382	2.3403	2.3499	2.3499	2.3517	2.3462	2.3403	2.3361	2.3318
util living area	0.9457	0.9180	0.8675	0.7691	0.6384	0.4941	0.3805	0.4302	0.6351	0.8351	0.9226	0.9512 (86)
MIT	18.0088	18.4066	19.0361	19.8159	20.4136	20.7737	20.9117	20.8799	20.5728	19.7453	18.7415	17.9414 (87)
Th 2	19.5822	19.5843	19.5864	19.5961	19.5979	19.6064	19.6079	19.6079	19.6031	19.5979	19.5942	19.5904 (88)
util rest of house	0.9357	0.9034	0.8441	0.7293	0.5771	0.4073	0.2713	0.3163	0.5499	0.7959	0.9063	0.9422 (89)
MIT 2	16.2033	16.7002	17.4783	18.4156	19.0881	19.4570	19.5692	19.5527	19.2860	18.3693	17.1364	16.1229 (90)
Living area fraction	fLA = Living area / (4) =											
MIT	17.0790	17.5278	18.2338	19.0947	19.7310	20.0956	20.2203	20.1964	19.9101	19.0366	17.9149	17.0048 (92)
Temperature adjustment												
adjusted MIT	17.0790	17.5278	18.2338	19.0947	19.7310	20.0956	20.2203	20.1964	19.9101	19.0366	17.9149	17.0048 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9110	0.8753	0.8162	0.7129	0.5834	0.4393	0.3211	0.3667	0.5704	0.7768	0.8800	0.9188 (94)
Useful gains	481.8338	557.0170	618.4225	652.0471	598.3945	453.2332	315.8883	324.6504	436.6138	482.7504	466.9517	461.6467 (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	1202.3652	1186.0486	1100.1747	948.0977	745.7253	506.6498	333.7590	349.5281	537.1284	783.3923	1007.3477	1196.5667 (97)
Space heating kWh	536.0754	422.7092	358.4237	213.1564	109.6141	0.0000	0.0000	0.0000	0.0000	223.6776	389.0851	546.7805 (98a)
Space heating requirement - total per year (kWh/year)	2799.5219											
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	536.0754	422.7092	358.4237	213.1564	109.6141	0.0000	0.0000	0.0000	0.0000	223.6776	389.0851	546.7805 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)	2799.5219											
Space heating per m ²	(98c) / (4) = 48.8743 (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 %)												92.3000 (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	536.0754	422.7092	358.4237	213.1564	109.6141	0.0000	0.0000	0.0000	0.0000	223.6776	389.0851	546.7805 (98)
Space heating efficiency (main heating system 1)	92.3000	92.3000	92.3000	92.3000	92.3000	0.0000	0.0000	0.0000	0.0000	92.3000	92.3000	92.3000 (210)
Space heating fuel (main heating system)	580.7967	457.9731	388.3247	230.9387	118.7585	0.0000	0.0000	0.0000	0.0000	242.3376	421.5440	592.3949 (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	181.8348	160.8580	171.3954	152.3287	148.6776	135.1114	134.3585	139.1763	140.0927	154.8106	162.8286	180.1013 (64)

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Efficiency of water heater (217)m	86.3338	86.1226	85.6742	84.8133	83.3866	79.8000	79.8000	79.8000	79.8000	84.8842	85.9405	79.8000 (216)
Fuel for water heating, kWh/month	210.6183	186.7778	200.0549	179.6048	178.2991	169.3125	168.3690	174.4064	175.5548	182.3785	189.4667	86.3860 (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	17.4011	13.9598	12.5692	9.2088	7.1131	5.8115	6.4888	8.4344	10.9555	14.3742	16.2356	17.8847 (232)
Electricity generated by PVs (Appendix M) (negative quantity) (233a)m	-33.7571	-46.6356	-65.7354	-72.4785	-77.0319	-71.5657	-70.7223	-67.3222	-61.1329	-52.6881	-36.7885	-29.3026 (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	-22.1020	-46.1087	-90.9234	-135.5164	-178.1666	-178.5965	-176.4473	-149.8192	-110.4118	-65.5264	-29.3771	-17.5029 (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												3033.0681 (211)
Space heating fuel - main system 2												0.0000 (213)
Space heating fuel - secondary												0.0000 (215)
Efficiency of water heater												79.8000
Water heating fuel used												2223.3274 (219)
Space cooling fuel												0.0000 (221)
Electricity for pumps and fans:												
Total electricity for the above, kWh/year												86.0000 (231)
Electricity for lighting (calculated in Appendix L)												140.4366 (232)
Energy saving/generation technologies (Appendices M ,N and Q)												
PV generation												-1885.6593 (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												3597.1728 (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	3033.0681	0.2100	636.9443 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	2223.3274	0.2100	466.8987 (264)
Space and water heating			1103.8431 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	140.4366	0.1443	20.2693 (268)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-685.1609	0.1350	-92.4876
PV Unit electricity exported	-1200.4985	0.1261	-151.4201
Total			-243.9077 (269)
Total CO2, kg/year			892.1340 (272)
EPC Target Carbon Dioxide Emission Rate (TER)			15.5700 (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	3033.0681	1.1300	3427.3670 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2223.3274	1.1300	2512.3599 (278)
Space and water heating			5939.7269 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	140.4366	1.5338	215.4064 (282)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-685.1609	1.4989	-1026.9944
PV Unit electricity exported	-1200.4985	0.4630	-555.8295
Total			-1582.8239 (283)
Total Primary energy kWh/year			4702.4102 (286)
Target Primary Energy Rate (TPER)			82.1000 (287)