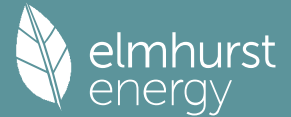


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Property Reference	Flat 2		Issued on Date	26/07/2023	
Assessment Reference	Flat 2 - Baseline	Prop Type Ref			
Property	Flat 2, Pier View Hotel, 34 Oldminster Road, Sharpness, Berkeley, G13 9NA				
SAP Rating	75 C	DER	27.63	TER	13.13
Environmental	74 C	% DER < TER			-110.43
CO ₂ Emissions (t/year)	2.8	DFEE	97.99	TTEE	48.48
Compliance Check	See BREL	% DFEE < TTEE			-102.12
% DPER < TPER	-118.91	DPER	151.25	TPER	69.09
Assessor Details	[REDACTED]			Assessor ID	AW87-0001
Client					

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)
Ground floor	116.6300 (1b)	x 3.2000 (2b)	= 373.2160 (1b) - (4)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)... (1n)	116.6300		
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)... (3n)	= 373.2160 (5)

2. Ventilation rate

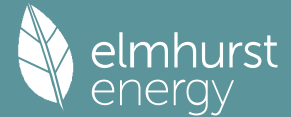
		m ³ per hour
Number of open chimneys	0 * 80 =	0.0000 (6a)
Number of open flues	0 * 20 =	0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 =	0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 =	0.0000 (6d)
Number of flues attached to other heater	0 * 35 =	0.0000 (6e)
Number of blocked chimneys	0 * 20 =	0.0000 (6f)
Number of intermittent extract fans	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)+(7a)+(7b)+(7c) =	20.0000 / (5) =	0.0536 (8)
Pressure test	No	
Pressure Test Method	Blower Door	
Measured/design AP50	15.0000	(17)
Infiltration rate	0.8036	(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) =	0.7433 (21)

Wind speed	Jan 5.1000	Feb 5.0000	Mar 4.9000	Apr 4.4000	May 4.3000	Jun 3.8000	Jul 3.8000	Aug 3.7000	Sep 4.0000	Oct 4.3000	Nov 4.5000	Dec 4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.9477	0.9291	0.9106	0.8177	0.7991	0.7062	0.7062	0.6876	0.7433	0.7991	0.8362	0.8734 (22b)
Effective ac	0.9491	0.9317	0.9146	0.8343	0.8193	0.7493	0.7493	0.7364	0.7763	0.8193	0.8496	0.8814 (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
Door			3.7300	1.4000	5.2220		(26)
New Windows (Uw = 1.40)			19.7300	1.3258	26.1572		(27)
External Door			2.0200	1.0000	2.0200		(26)
Ground Floor			116.6300	0.2500	29.1575	110.0000	12829.3000 (28a)
External Wall	105.1500	23.9000	81.2500	0.3000	24.3750	110.0000	8937.5000 (29a)
Corridor Wall	36.7000	1.5800	35.1200	0.3000	10.5360	9.0000	316.0800 (29a)
Total net area of external elements Aum(A, m ²)			258.4800				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)... (30) + (32) =	97.4677		(33)

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Party Wall	23.7100	0.0000	0.0000	180.0000	4267.8000 (32)
Party Ceiling	116.6300			30.0000	3498.9000 (32b)
Internal Wall	258.6900			9.0000	2328.2100 (32c)

Heat capacity Cm = Sum(A x k)	(28)...(30) + (32) + (32a)...(32e) =	32177.7900 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K		275.8963 (35)
Thermal bridges (Default value 0.200 * total exposed area)		51.6960 (36)
Point Thermal bridges	(36a) =	0.0000
Total fabric heat loss	(33) + (36) + (36a) =	149.1637 (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	116.8921	114.7443	112.6390	102.7506	100.9005	92.2880	92.2880	90.6931	95.6054	100.9005	104.6432	108.5560 (38)
Average = Sum(39)m / 12 =	266.0558	263.9080	261.8027	251.9143	250.0642	241.4517	241.4517	239.8568	244.7691	250.0642	253.8069	257.7197 (39)
	251.9054											

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	2.2812	2.2628	2.2447	2.1599	2.1441	2.0702	2.0702	2.0566	2.0987	2.1441	2.1762	2.2097 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

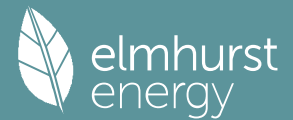
Assumed occupancy													2.8493 (42)	
Hot water usage for mixer showers														
	127.1894	125.2780	122.4927	117.1635	113.2307	108.8449	106.3520	109.1162	112.1463	116.8554	122.2990	126.7021 (42a)		
Hot water usage for baths														
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42b)		
Hot water usage for other uses														
	43.8096	42.2166	40.6235	39.0304	37.4373	35.8443	35.8443	37.4373	39.0304	40.6235	42.2166	43.8096 (42c)		
Average daily hot water use (litres/day)													157.0913 (43)	
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
	170.9990	167.4945	163.1162	156.1939	150.6681	144.6892	142.1963	146.5536	151.1767	157.4789	164.5156	170.5117 (44)		
Energy content (annual)	270.8207	238.5100	250.7035	213.8217	202.8282	177.9122	171.9741	181.4639	186.4160	213.6973	234.3826	266.9801 (45)		
Distribution loss (46)m = 0.15 x (45)m													Total = Sum(45)m = 2609.5103	
Water storage loss:	40.6231	35.7765	37.6055	32.0733	30.4242	26.6868	25.7961	27.2196	27.9624	32.0546	35.1574	40.0470 (46)		
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)		
If cylinder contains dedicated solar storage														
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 (57)		
Combi loss	0.4745	0.4680	0.5578	0.5646	0.6028	0.5926	0.5985	0.5841	0.5483	0.5478	0.5018	0.4756 (61)		
Total heat required for water heating calculated for each month	271.2952	238.9780	251.2613	214.3862	203.4310	178.5048	172.5726	182.0480	186.9644	214.2451	234.8844	267.4557 (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	271.2952	238.9780	251.2613	214.3862	203.4310	178.5048	172.5726	182.0480	186.9644	214.2451	234.8844	267.4557 (64)		
Total per year (kWh/year)													Total per year (kWh/year) = Sum(64)m = 2616.0267 (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	90.1665	79.4216	83.4984	71.2369	67.5911	59.3040	57.3310	60.4828	62.1204	71.1913	78.0577	88.8898 (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	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	146.1825	161.8449	146.1825	151.0552	146.1825	151.0552	146.1825	146.1825	151.0552	146.1825	151.0552	146.1825 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	280.7587	283.6721	276.3304	260.7009	240.9714	222.4284	210.0406	207.1272	214.4689	230.0984	249.8279	268.3708 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	37.2465	37.2465	37.2465	37.2465	37.2465	37.2465	37.2465	37.2465	37.2465	37.2465	37.2465	37.2465 (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)	-113.9719	-113.9719	-113.9719	-113.9719	-113.9719	-113.9719	-113.9719	-113.9719	-113.9719	-113.9719	-113.9719	-113.9719 (71)
Water heating gains (Table 5)	121.1915	118.1869	112.2290	98.9401	90.8482	82.3666	77.0578	81.2941	86.2784	95.6872	108.4134	119.4755 (72)
Total internal gains	616.8721	632.4433	603.4813	579.4356	546.7415	521.5897	499.0204	500.3432	517.5419	540.7076	578.0360	602.7683 (73)

6. Solar gains

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[Jan]		Area m ²	Solar flux Table 6a W/m ²	Specific data or Table 6b	Specific data or Table 6c	Access factor Table 6d	Gains W
North		5.6600	10.6334	0.6300	0.7000	0.7700	18.3933 (74)
East		9.6700	19.6403	0.6300	0.7000	0.7700	58.0424 (76)
South		4.4000	46.7521	0.6300	0.7000	0.7700	62.8674 (78)

Solar gains	139.3031	251.6544	377.8726	516.8859	617.9282	629.1436	600.1421	523.3273	426.2961	287.6235	169.5819	117.3880 (83)
Total gains	756.1752	884.0977	981.3539	1096.3215	1164.6697	1150.7333	1099.1625	1023.6705	943.8381	828.3311	747.6179	720.1563 (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, n _{l,m} (see Table 9a)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	33.5955	33.8689	34.1413	35.4814	35.7439	37.0189	37.0189	37.2651	36.5172	35.7439	35.2168	34.6822	
alpha	3.2397	3.2579	3.2761	3.3654	3.3829	3.4679	3.4679	3.4843	3.4345	3.3829	3.3478	3.3121	
util living area	0.9973	0.9952	0.9912	0.9793	0.9494	0.8745	0.7628	0.8052	0.9353	0.9857	0.9956	0.9978 (86)	
MIT	18.3674	18.5894	18.9746	19.5663	20.1123	20.6036	20.8353	20.7943	20.4095	19.7015	18.9836	18.3966 (87)	
Th 2	19.1525	19.1639	19.1752	19.2288	19.2390	19.2869	19.2869	19.2959	19.2684	19.2390	19.2185	19.1972 (88)	
util rest of house	0.9962	0.9932	0.9869	0.9677	0.9147	0.7697	0.5473	0.6100	0.8723	0.9756	0.9933	0.9969 (89)	
MIT 2	16.8700	17.0987	17.4895	18.1099	18.6423	19.1060	19.2522	19.2442	18.9448	18.2549	17.5284	16.9283 (90)	
Living area fraction	FLA = Living area / (4) = 0.1386 (91)												
MIT	17.0776	17.3054	17.6954	18.3118	18.8461	19.3136	19.4717	19.4591	19.1478	18.4555	17.7301	17.1319 (92)	
Temperature adjustment	0.0000												
adjusted MIT	17.0776	17.3054	17.6954	18.3118	18.8461	19.3136	19.4717	19.4591	19.1478	18.4555	17.7301	17.1319 (93)	

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9940	0.9897	0.9814	0.9585	0.9034	0.7719	0.5768	0.6347	0.8657	0.9681	0.9901	0.9951 (94)
Useful gains	751.6543	874.9963	963.0702	1050.7946	1052.1218	888.2294	634.0001	649.7461	817.0728	801.9261	740.2309	716.6209 (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	3399.5581	3273.8850	2930.9856	2370.9637	1786.9923	1138.1063	693.3744	733.7480	1235.5545	1964.3753	2697.9954	3332.7986 (97)
Space heating kWh	1970.0404	1612.0532	1464.1291	950.5218	546.7436	0.0000	0.0000	0.0000	0.0000	864.8622	1409.5904	1946.4362 (98a)
Space heating requirement - total per year (kWh/year)												10764.3769
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	1970.0404	1612.0532	1464.1291	950.5218	546.7436	0.0000	0.0000	0.0000	0.0000	864.8622	1409.5904	1946.4362 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												10764.3769
Space heating per m ²												(98c) / (4) = 92.2951 (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 %)													89.1000 (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	1970.0404	1612.0532	1464.1291	950.5218	546.7436	0.0000	0.0000	0.0000	0.0000	864.8622	1409.5904	1946.4362 (98)	
Space heating efficiency (main heating system 1)	89.1000	89.1000	89.1000	89.1000	89.1000	0.0000	0.0000	0.0000	0.0000	89.1000	89.1000	89.1000 (210)	
Space heating fuel (main heating system)	2211.0442	1809.2629	1643.2425	1066.8033	613.6292	0.0000	0.0000	0.0000	0.0000	970.6647	1582.0319	2184.5524 (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	271.2952	238.9780	251.2613	214.3862	203.4310	178.5048	172.5726	182.0480	186.9644	214.2451	234.8844	267.4557 (64)	
Efficiency of water heater (217)m	88.5828	88.5486	88.4749	88.3160	87.9496	85.0000	85.0000	85.0000	85.0000	88.2548	88.4903	85.0000 (216)	
Fuel for water heating, kWh/month	306.2616	269.8836	283.9916	242.7490	231.3040	210.0056	203.0266	214.1741	219.9581	242.7574	265.4351	301.9239 (219)	
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	38.5890	30.9576	27.8738	20.4216	15.7742	12.8877	14.3898	18.7044	24.2951	31.8765	36.0044	39.6615 (232)	
Electricity generated by PVs (Appendix M) (negative quantity)													

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(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	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	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	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	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	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	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	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	0.0000	(235d)
Annual totals kWh/year														
Space heating fuel - main system 1													12081.2311	(211)
Space heating fuel - main system 2													0.0000	(213)
Space heating fuel - secondary													0.0000	(215)
Efficiency of water heater													85.0000	
Water heating fuel used													2991.4707	(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)													311.4356	(232)
Energy saving/generation technologies (Appendices M, N and O)														
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													15470.1374	(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	12081.2311	0.2100	2537.0585 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	2991.4707	0.2100	628.2088 (264)
Space and water heating			3165.2674 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	311.4356	0.1443	44.9498 (268)
Total CO2, kg/year			3222.1464 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			27.6300 (273)

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

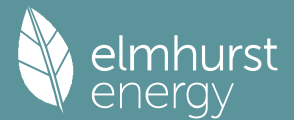
	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Space heating - main system 1	12081.2311	1.1300	13651.7912 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2991.4707	1.1300	3380.3619 (278)
Space and water heating			17032.1531 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	311.4356	1.5338	477.6903 (282)
Total Primary energy kWh/year			17639.9441 (286)
Dwelling Primary energy Rate (DPER)			151.2500 (287)

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

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	116.6300 (1b)	x 3.2000 (2b)	= 373.2160 (1b) -
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)... (1n)	116.6300		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)... (3n)	= 373.2160 (5)

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If cylinder contains dedicated solar storage												
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 (57)
Combi loss	50.9589	46.0274	50.9589	49.3151	50.9589	49.3151	50.9589	50.9589	49.3151	50.9589	49.3151	50.9589 (61)
Total heat required for water heating calculated for each month												
WWHRS	266.8422	235.8844	250.3169	219.3937	212.2152	190.7261	187.8538	195.5750	198.0163	221.4094	236.1784	263.8341 (62)
PV diverter	-42.2878	-37.3996	-39.1628	-32.4283	-30.2220	-25.8612	-24.2407	-25.7776	-26.7570	-31.5435	-35.7350	-41.5047 (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)
	224.5545	198.4848	211.1542	186.9654	181.9931	164.8649	163.6131	169.7974	171.2593	189.8659	200.4434	222.3294 (64)
Total per year (kWh/year) = Sum(64)m =											2285.3254 (64)	
Electric shower(s)											2285 (64)	
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =											0.0000 (64a)	
Heat gains from water heating, kWh/month												
	84.5209	74.6343	79.0263	68.8799	66.3574	59.3479	58.2573	60.8246	61.7719	69.4145	74.4608	83.5207 (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
Lighting gains	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648	142.4648 (66)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5												
Cooking gains	280.7587	283.6721	276.3304	260.7009	240.9714	222.4284	210.0406	207.1272	214.4689	230.0984	249.8279	268.3708 (67)
Pumps, fans												
Losses e.g. evaporation	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)
Water heating gains (Table 5)												
Total internal gains	113.6034	111.0630	106.2181	95.6666	89.1901	82.4277	78.3028	81.7535	85.7943	93.2991	103.4178	112.2590 (72)
	609.2840	625.3194	597.4704	576.1621	545.0834	521.6508	500.2654	500.8026	517.0579	538.3194	573.0404	595.5518 (73)

6. Solar gains

[Jan]	Area	Solar flux	g	FF	Access	Gains						
	m ²	Table 6a	Specific data	Specific data	factor	W						
		W/m ²	or Table 6b	or Table 6c	Table 6d							
North	5.6600	10.6334	0.6300	0.7000	0.7700	18.3933 (74)						
East	9.6700	19.6403	0.6300	0.7000	0.7700	58.0424 (76)						
South	4.4000	46.7521	0.6300	0.7000	0.7700	62.8674 (78)						
Solar gains	139.3031	251.6544	377.8726	516.8859	617.9282	629.1436	600.1421	523.3273	426.2961	287.6235	169.5819	117.3880 (83)
Total gains	748.5871	876.9738	975.3430	1093.0480	1163.0116	1150.7944	1100.4075	1024.1299	943.3540	825.9429	742.6223	712.9399 (84)

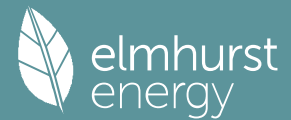
7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												
Utilisation factor for gains for living area, ni1,m (see Table 9a)												
tau	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
alpha	61.7969	61.9723	62.1453	62.9707	63.1275	63.8682	63.8682	64.0073	63.5809	63.1275	62.8110	62.4835
util living area	5.1198	5.1315	5.1430	5.1980	5.2085	5.2579	5.2579	5.2672	5.2387	5.2085	5.1874	5.1656
	0.9985	0.9964	0.9908	0.9678	0.8979	0.7384	0.5655	0.6247	0.8651	0.9808	0.9967	0.9989 (86)
MIT	19.5823	19.7617	20.0340	20.4148	20.7402	20.9363	20.9872	20.9790	20.8464	20.4194	19.9389	19.5607 (87)
Th 2	19.8525	19.8554	19.8582	19.8714	19.8739	19.8854	19.8854	19.8876	19.8810	19.8739	19.8689	19.8636 (88)
util rest of house	0.9980	0.9950	0.9868	0.9532	0.8515	0.6376	0.4300	0.4867	0.7886	0.9694	0.9951	0.9984 (89)
MIT 2	18.2111	18.4425	18.7912	19.2765	19.6564	19.8512	19.8819	19.8811	19.7785	19.2910	18.6795	18.1914 (90)
Living area fraction	18.4012	18.6254	18.9635	19.4343	19.8067	20.0016	20.0352	20.0333	19.9266	19.4475	18.8541	18.3812 (91)
MIT	18.4012	18.6254	18.9635	19.4343	19.8067	20.0016	20.0352	20.0333	19.9266	19.4475	18.8541	18.3812 (92)
Temperature adjustment												0.0000
adjusted MIT	18.4012	18.6254	18.9635	19.4343	19.8067	20.0016	20.0352	20.0333	19.9266	19.4475	18.8541	18.3812 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	0.9968	0.9926	0.9824	0.9457	0.8482	0.6491	0.4488	0.5058	0.7923	0.9633	0.9929	0.9975 (94)
Ext temp.	746.2032	870.5273	958.1559	1033.7361	986.4693	746.9719	493.9165	518.0042	747.4237	795.6033	737.3666	711.1702 (95)
Heat loss rate W	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000 (96)
	2113.5160	2051.3685	1857.5873	1549.4785	1189.4317	783.3526	498.1728	525.7574	848.7993	1298.1268	1733.2860	2102.1566 (97)

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Space heating kWh	1017.2807	793.5253	669.1769	371.3345	151.0040	0.0000	0.0000	0.0000	0.0000	373.8775	717.0620	1034.8939 (98a)
Space heating requirement - total per year (kWh/year)												5128.1548
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	1017.2807	793.5253	669.1769	371.3345	151.0040	0.0000	0.0000	0.0000	0.0000	373.8775	717.0620	1034.8939 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												5128.1548
Space heating per m2												(98c) / (4) = 43.9694 (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 %)												92.4000 (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	1017.2807	793.5253	669.1769	371.3345	151.0040	0.0000	0.0000	0.0000	0.0000	373.8775	717.0620	1034.8939 (98)
Space heating efficiency (main heating system 1)	92.4000	92.4000	92.4000	92.4000	92.4000	0.0000	0.0000	0.0000	0.0000	92.4000	92.4000	92.4000 (210)
Space heating fuel (main heating system)	1100.9531	858.7936	724.2175	401.8772	163.4243	0.0000	0.0000	0.0000	0.0000	404.6293	776.0411	1120.0151 (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	224.5545	198.4848	211.1542	186.9654	181.9931	164.8649	163.6131	169.7974	171.2593	189.8659	200.4434	222.3294 (64)
Efficiency of water heater (217)m	87.2111	87.0350	86.6735	85.8220	83.9842	80.3000	80.3000	80.3000	80.3000	85.8050	86.8675	80.3000 (216)
Fuel for water heating, kWh/month	257.4839	228.0518	243.6202	217.8527	216.6993	205.3113	203.7523	211.4538	213.2744	221.2760	230.7460	254.8259 (219)

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	30.3738	24.3670	21.9398	16.0740	12.4160	10.1440	11.3263	14.7224	19.1229	25.0903	28.3395	31.2180 (232)
Electricity generated by PVs (Appendix M) (negative quantity) (233a)m	-38.3169	-55.0557	-80.6195	-92.3668	-101.0230	-94.7492	-93.5292	-87.5734	-77.3356	-63.6804	-42.4720	-33.0029 (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	-18.6062	-39.4552	-79.0233	-119.5899	-159.0364	-160.1781	-158.3484	-133.7041	-97.4766	-56.7858	-24.9540	-14.6942 (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												5549.9511 (211)
Space heating fuel - main system 2												0.0000 (213)
Space heating fuel - secondary												0.0000 (215)
Efficiency of water heater												80.3000
Water heating fuel used												2704.3476 (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)												245.1342 (232)

Energy saving/generation technologies (Appendices M, N and O)

PV generation												-1921.5767 (233)
Wind generation												0.0000 (234)
Hydro-electric generation (Appendix N)												0.0000 (235a)
Electricity generated - Micro CHP (Appendix N)												0.0000 (235)
Appendix O - special features												
Energy saved or generated												-0.0000 (236)
Energy used												0.0000 (237)
Total delivered energy for all uses												6663.8563 (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	5549.9511	0.2100	1165.4897 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	2704.3476	0.2100	567.9130 (264)

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Space and water heating			1733.4027 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	245.1342	0.1443	35.3804 (268)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-859.7244	0.1342	-115.3809
PV Unit electricity exported	-1061.8523	0.1257	-133.4376
Total			-248.8185 (269)
Total CO2, kg/year			1531.8939 (272)
EPC Target Carbon Dioxide Emission Rate (TER)			13.1300 (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	5549.9511	1.1300	6271.4448 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2704.3476	1.1300	3055.9127 (278)
Space and water heating			9327.3575 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	245.1342	1.5338	375.9951 (282)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-859.7244	1.4960	-1286.1345
PV Unit electricity exported	-1061.8523	0.4613	-489.7954
Total			-1775.9299 (283)
Total Primary energy kWh/year			8057.5235 (286)
Target Primary Energy Rate (TPER)			69.0900 (287)