

Full SAP Calculation Printout



Plot Reference	UNIT 01			Issued on Date	08/07/2026
Assessment Reference	001	Plot Type Ref	UNIT 01		
Plot Address	UNIT 01, Stoney Wood Quarter, 34 The Fairway, LONDON, NW7 3HS			SAP Version	10.2
SAP Rating	85 B	DER	12.48	TER	14.66
Environmental	90 B	% DER < TER			14.87
CO ₂ Emissions (t/year)	0.92	DFEE	35.83	TFEE	40.63
Compliance Check	See BREL	% DFEE < TFEE			11.81
% DPER < TPER	9.16	DPER	71.26	TPER	78.44
Assessor Details	Mr. Ondrej Gajdos			Assessor ID	W452-0001
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)
Main dwelling			
Ground floor	79.0000 (1b)	3.0000 (2b)	237.0000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	79.0000		237.0000 (4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	237.0000 (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	0 * 10 = 0.0000 (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)	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	4 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.7000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.1050 (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	0.1339	0.1313	0.1286	0.1155	0.1129	0.0997	0.0997	0.0971	0.1050	0.1129	0.1181	0.1234 (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) =												81.0000 (23c)
Effective ac	0.2289	0.2262	0.2236	0.2105	0.2079	0.1947	0.1947	0.1921	0.2000	0.2079	0.2131	0.2184 (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							
1			21.8900	0.7940	17.3797		(27)
ground floor			79.0000	0.1000	7.9000	110.0000	8690.0000 (28a)
exposed wall	44.4000	21.8900	22.5100	0.1500	3.3765	60.0000	1350.6001 (29a)
stair wall	20.7000		20.7000	0.2000	4.1400	9.0000	186.3000 (29a)
corridor wall	16.2000		16.2000	0.3100	5.0220	14.0000	226.8000 (29a)
Total net area of external elements Aum(A, m ²)			160.3000				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		37.8182		(33)
Main dwelling							
pw			38.4000	0.0000	0.0000	110.0000	4224.0002 (32)
pc			79.0000			30.0000	2370.0000 (32b)
iw			176.4000			9.0000	1587.5999 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	18635.3002 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							235.8899 (35)
List of Thermal Bridges							

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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)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	82.8414	83.1144	83.3893	84.7915	85.0776	86.5376	86.5376	86.8356	85.9476	85.0776	84.5073	83.9446	21.0000 (85)
alpha	6.5228	6.5410	6.5593	6.6528	6.6718	6.7692	6.7692	6.7890	6.7298	6.6718	6.6338	6.5963	
util living area	0.9893	0.9714	0.9168	0.7522	0.5460	0.3710	0.2684	0.3092	0.5302	0.8549	0.9731	0.9917	(86)
MIT	20.2991	20.4919	20.7327	20.9391	20.9927	20.9995	21.0000	20.9999	20.9956	20.8871	20.5644	20.2706	(87)
Th 2	20.2612	20.2634	20.2657	20.2770	20.2793	20.2906	20.2906	20.2929	20.2861	20.2793	20.2747	20.2702	(88)
util rest of house													
	0.9864	0.9642	0.8988	0.7170	0.5052	0.3300	0.2251	0.2617	0.4768	0.8199	0.9651	0.9895	(89)
MIT 2	19.4488	19.6916	19.9842	20.2213	20.2737	20.2903	20.2906	20.2928	20.2834	20.1757	19.7939	19.4199	(90)
Living area fraction													
MIT	19.7115	19.9388	20.2154	20.4430	20.4958	20.5094	20.5097	20.5112	20.5033	20.3954	20.0319	19.6827	(92)
Temperature adjustment												-0.1500	
adjusted MIT	19.5615	19.7888	20.0654	20.2930	20.3458	20.3594	20.3597	20.3612	20.3533	20.2454	19.8819	19.5327	(93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9829	0.9587	0.8934	0.7178	0.5090	0.3340	0.2293	0.2663	0.4819	0.8181	0.9598	0.9865	(94)
Useful gains	580.0557	660.9008	706.4338	666.9472	523.0809	344.3756	224.8870	236.1154	375.1551	535.0335	558.9698	555.6148	(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	953.6364	927.2920	842.0826	695.5358	526.0447	344.5131	224.8951	236.1372	376.6282	586.8670	782.9537	945.4947	(97)
Space heating kWh	277.9440	179.0149	100.9227	20.5838	2.2051	0.0000	0.0000	0.0000	0.0000	38.5642	161.2684	290.0707	(98a)
Space heating requirement - total per year (kWh/year)												1070.5736	
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	277.9440	179.0149	100.9227	20.5838	2.2051	0.0000	0.0000	0.0000	0.0000	38.5642	161.2684	290.0707	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1070.5736	
Space heating per m2										(98c) / (4) =		13.5516	(99)

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

Fraction of space heat from secondary/supplementary system (Table 11)

Fraction of space heat from main system(s)

Efficiency of main space heating system 1 (in %)

Efficiency of main space heating system 2 (in %)

Efficiency of secondary/supplementary heating system, %

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	277.9440	179.0149	100.9227	20.5838	2.2051	0.0000	0.0000	0.0000	0.0000	38.5642	161.2684	290.0707	(98)
Space heating efficiency (main heating system 1)	88.9000	88.9000	88.9000	88.9000	88.9000	0.0000	0.0000	0.0000	0.0000	88.9000	88.9000	88.9000	(210)
Space heating fuel (main heating system)	312.6479	201.3666	113.5239	23.1539	2.4804	0.0000	0.0000	0.0000	0.0000	43.3792	181.4042	326.2888	(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	261.6041	231.3788	245.7002	215.5685	208.6992	187.7499	184.9849	192.4399	194.6906	217.4815	231.7528	258.6703	(64)
Efficiency of water heater (217)m	84.5115	83.8377	82.6273	80.9828	80.3813	80.3000	80.3000	80.3000	80.3000	81.4873	83.6192	84.6276	(216)
Fuel for water heating, kWh/month	309.5484	275.9841	297.3595	266.1904	259.6366	233.8106	230.3673	239.6511	242.4541	266.8902	277.1526	305.6572	(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	20.5003	18.5164	20.5003	19.8390	20.5003	19.8390	20.5003	20.5003	19.8390	20.5003	19.8390	20.5003	(231)
Lighting	22.7773	18.2728	16.4526	12.0539	9.3108	7.6070	8.4936	11.0403	14.3403	18.8152	21.2517	23.4103	(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												1204.2448	(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												3204.7020	(219)
Space cooling fuel												0.0000	(221)

Electricity for pumps and fans:

(BalancedWithHeatRecovery, Database: in-use factor = 1.1000, SFP = 0.6930)

mechanical ventilation fans (SFP = 0.6930)

central heating pump

Total electricity for the above, kWh/year

Electricity for lighting (calculated in Appendix L)

200.3740 (230a)

41.0000 (230c)

241.3740 (231)

183.8257 (232)

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

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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	4834.1466 (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	1204.2448	0.2100	252.8914 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	3204.7020	0.2100	672.9874 (264)
Space and water heating			925.8788 (265)
Pumps, fans and electric keep-hot	241.3740	0.1387	33.4816 (267)
Energy for lighting	183.8257	0.1443	26.5317 (268)
Total CO2, kg/year			985.8921 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			12.4800 (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	1204.2448	1.1300	1360.7966 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	3204.7020	1.1300	3621.3133 (278)
Space and water heating			4982.1100 (279)
Pumps, fans and electric keep-hot	241.3740	1.5128	365.1506 (281)
Energy for lighting	183.8257	1.5338	281.9580 (282)
Total Primary energy kWh/year			5629.2186 (286)
Dwelling Primary energy Rate (DPER)			71.2600 (287)

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

1. Overall dwelling characteristics

	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling	79.0000 (1b)	3.0000 (2b)	237.0000 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	79.0000		237.0000 (4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 237.0000 (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	3 * 10 = 30.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	30.0000 / (5) = 0.1266 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	5.0000 (17)
Infiltration rate	0.3766 (18)
Number of sides sheltered	4 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.7000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.2636 (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	0.3361	0.3295	0.3229	0.2900	0.2834	0.2504	0.2504	0.2438	0.2636	0.2834	0.2966	0.3097 (22b)
Effective ac	0.5565	0.5543	0.5521	0.5420	0.5402	0.5314	0.5314	0.5297	0.5347	0.5402	0.5440	0.5480 (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 Opening Type			19.7500	1.1450	22.6145		(27)
ground floor			79.0000	0.1300	10.2700		(28a)
exposed wall	44.4000	19.7500	24.6500	0.1800	4.4370		(29a)

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stair wall	20.7000	20.7000	0.1800	3.7260	(29a)
corridor wall	16.2000	16.2000	0.1800	2.9160	(29a)
Total net area of external elements Aum(A, m2)		160.3000			(31)
Fabric heat loss, W/K = Sum (A x U)		(26)...(30) + (32) =		43.9635	(33)
Main dwelling					
pw		38.4000	0.0000	0.0000	(32)

Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K 235.8899 (35)

List of Thermal Bridges					
K1 Element	Length	Psi-value	Total		
E2 Other lintels (including other steel lintels)	8.2000	0.0500	0.4100		
E3 Sill	8.2000	0.0500	0.4100		
E4 Jamb	19.4800	0.0500	0.9740		
E5 Ground floor (normal)	14.9000	0.1600	2.3840		
E7 Party floor between dwellings (in blocks of flats)	28.0000	0.0700	1.9600		
E16 Corner (normal)	12.0000	0.0900	1.0800		
E17 Corner (inverted - internal area greater than external area)	9.0000	-0.0900	-0.8100		
E18 Party wall between dwellings	3.0000	0.0600	0.1800		
E25 Staggered party wall between dwellings	3.0000	0.0600	0.1800		

Thermal bridges (Sum(L x Psi) calculated using Appendix K) 6.7680 (36)

Point Thermal bridges (36a) = 0.0000

Total fabric heat loss (33) + (36) + (36a) = 50.7315 (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	43.5224	43.3509	43.1827	42.3930	42.2453	41.5574	41.5574	41.4300	41.8224	42.2453	42.5442	42.8567
Average = Sum(39)m / 12 =	94.2539	94.0824	93.9143	93.1245	92.9768	92.2889	92.2889	92.1616	92.5539	92.9768	93.2757	93.5882
												93.1238

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.1931	1.1909	1.1888	1.1788	1.1769	1.1682	1.1682	1.1666	1.1716	1.1769	1.1807	1.1847
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.4436
Hot water usage for mixer showers												
Hot water usage for baths	65.1911	64.2114	62.7838	60.0523	58.0365	55.7886	54.5108	55.9276	57.4807	59.8943	62.6845	64.9413
Hot water usage for other uses	28.1575	27.7393	27.1505	26.0647	25.2516	24.3501	23.8631	24.4479	25.0846	26.0493	27.1574	28.0623
Average daily hot water use (litres/day)	39.6550	38.2130	36.7710	35.3290	33.8870	32.4450	32.4450	33.8870	35.3290	36.7710	38.2130	39.6550
												122.2605
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	133.0036	130.1637	126.7052	121.4460	117.1752	112.5837	110.8190	114.2626	117.8944	122.7147	128.0550	132.6587
Energy content (annual)	210.6452	185.3514	194.7412	166.2535	157.7403	138.4348	134.0260	141.4810	145.3756	166.5226	182.4378	207.7114
Distribution loss (46)m = 0.15 x (45)m												
Water storage loss (or HIU loss):	31.5968	27.8027	29.2112	24.9380	23.6611	20.7652	20.1039	21.2221	21.8063	24.9784	27.3657	31.1567
Total storage loss												
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
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
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
Total heat required for water heating calculated for each month	261.6041	231.3788	245.7002	215.5685	208.6992	187.7499	184.9849	192.4399	194.6906	217.4815	231.7528	258.6703
WWHRS	-29.8026	-26.3577	-27.6003	-22.8541	-21.2992	-18.2259	-17.0839	-18.1670	-18.8572	-22.2306	-25.1845	-29.2507
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
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
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
Output from w/h	231.8015	205.0211	218.0999	192.7144	187.4000	169.5240	167.9011	174.2729	175.8334	195.2510	206.5683	229.4196
12Total per year (kWh/year)												2353.8072
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
Heat gains from water heating, kWh/month	82.7793	73.1362	77.4912	67.6080	65.1884	58.3583	57.3034	59.7821	60.6661	68.1085	72.9893	81.8038

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 (calculated in Appendix L, equation L9 or L9a), also see Table 5	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807	122.1807
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	109.6220	121.3672	109.6220	113.2761	109.6220	113.2761	109.6220	109.6220	113.2761	109.6220	113.2761	109.6220
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	217.3379	219.5931	213.9099	201.8109	186.5382	172.1839	162.5944	160.3391	166.0223	178.1213	193.3941	207.7483
Pumps, fans	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181	35.2181
Losses e.g. evaporation (negative values) (Table 5)	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000
Water heating gains (Table 5)	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445	-97.7445
Total internal gains	111.2624	108.8336	104.1548	93.9001	87.6188	81.0533	77.0207	80.3523	84.2585	91.5437	101.3741	109.9513

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
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Northeast	8.9200	11.2829	0.6300	0.7000	0.7700	30.7581 (75)
East	10.8300	19.6403	0.6300	0.7000	0.7700	65.0051 (76)

Solar gains	95.7632	189.7727	322.2221	490.6799	623.3284	648.6527	613.1472	511.3430	381.0152	227.4037	119.7554	78.5756 (83)
Total gains	596.6397	702.2209	812.5630	962.3211	1069.7615	1074.8201	1022.0384	921.3106	804.2263	669.3448	590.4537	568.5514 (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	54.9205	55.0206	55.1191	55.5866	55.6749	56.0899	56.0899	56.1674	55.9293	55.6749	55.4965	55.3112
alpha	4.6614	4.6680	4.6746	4.7058	4.7117	4.7393	4.7393	4.7445	4.7286	4.7117	4.6998	4.6874
util living area	0.9932	0.9850	0.9619	0.8830	0.7275	0.5345	0.3943	0.4538	0.7191	0.9380	0.9863	0.9946 (86)
MIT	19.6174	19.8401	20.1820	20.6086	20.8778	20.9772	20.9956	20.9918	20.9147	20.5208	19.9916	19.5794 (87)
Th 2	19.9255	19.9273	19.9290	19.9370	19.9385	19.9455	19.9455	19.9468	19.9428	19.9385	19.9355	19.9323 (88)
util rest of house	0.9911	0.9804	0.9503	0.8507	0.6666	0.4527	0.3014	0.3531	0.6348	0.9131	0.9814	0.9929 (89)
MIT 2	18.3322	18.6156	19.0444	19.5580	19.8425	19.9333	19.9442	19.9440	19.8879	19.4724	18.8161	18.2886 (90)
Living area fraction									fLA = Living area / (4) =			0.3089 (91)
MIT	18.7292	18.9938	19.3958	19.8824	20.1623	20.2557	20.2689	20.2676	20.2051	19.7962	19.1792	18.6873 (92)
Temperature adjustment												0.0000
adjusted MIT	18.7292	18.9938	19.3958	19.8824	20.1623	20.2557	20.2689	20.2676	20.2051	19.7962	19.1792	18.6873 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9878	0.9751	0.9432	0.8489	0.6802	0.4773	0.3301	0.3843	0.6572	0.9090	0.9766	0.9900 (94)
Useful gains	589.3779	684.7515	766.3717	816.8846	727.6233	513.0643	337.3931	354.0198	528.5524	608.4416	576.6196	562.8943 (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	1360.0063	1325.9781	1211.0954	1022.7348	786.7967	521.9589	338.6005	356.4447	565.0477	855.0330	1126.6940	1355.8364 (97)
Space heating kWh	573.3476	430.9042	330.8744	148.2122	44.0250	0.0000	0.0000	0.0000	0.0000	183.4640	396.0535	589.9489 (98a)
Space heating requirement - total per year (kWh/year)												2696.8298
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	573.3476	430.9042	330.8744	148.2122	44.0250	0.0000	0.0000	0.0000	0.0000	183.4640	396.0535	589.9489 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												2696.8298
Space heating per m2										(98c) / (4) =		34.1371 (99)

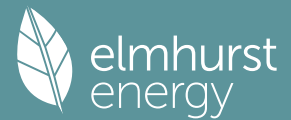
9a. Energy requirements - Individual heating systems, including micro-CHP

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	573.3476	430.9042	330.8744	148.2122	44.0250	0.0000	0.0000	0.0000	0.0000	183.4640	396.0535	589.9489 (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)	620.5060	466.3466	358.0892	160.4028	47.6461	0.0000	0.0000	0.0000	0.0000	198.5541	428.6294	638.4729 (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	231.8015	205.0211	218.0999	192.7144	187.4000	169.5240	167.9011	174.2729	175.8334	195.2510	206.5683	229.4196 (64)
Efficiency of water heater (217)m	86.2409	85.9329	85.2718	83.8253	81.8055	80.3000	80.3000	80.3000	80.3000	84.2482	85.7519	86.3118 (216)
Fuel for water heating, kWh/month	268.7837	238.5829	255.7703	229.9001	229.0801	211.1133	209.0922	217.0273	218.9706	231.7569	240.8906	265.8034 (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	22.7773	18.2728	16.4526	12.0539	9.3108	7.6070	8.4936	11.0403	14.3403	18.8152	21.2517	23.4103 (232)
Electricity generated by PVs (Appendix M) (negative quantity)												
(233a)m	-14.9015	-22.5214	-34.6742	-41.8467	-47.6769	-45.4402	-44.8828	-41.0881	-34.8767	-26.9665	-16.9091	-12.7127 (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	-4.3771	-9.4873	-19.3933	-29.9383	-40.3995	-40.8980	-40.4225	-33.8537	-24.3284	-13.8327	-5.9266	-3.4413 (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												2918.6470 (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												2816.7715 (219)
Space cooling fuel												0.0000 (221)

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Electricity for pumps and fans:	
Total electricity for the above, kWh/year	86.0000 (231)
Electricity for lighting (calculated in Appendix L)	183.8257 (232)
Energy saving/generation technologies (Appendices M ,N and Q)	
PV generation	-650.7955 (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	5354.4487 (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	2918.6470	0.2100	612.9159 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	2816.7715	0.2100	591.5220 (264)
Space and water heating			1204.4379 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	183.8257	0.1443	26.5317 (268)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-384.4968	0.1332	-51.1995
PV Unit electricity exported	-266.2987	0.1251	-33.3134
Total			-84.5129 (269)
Total CO2, kg/year			1158.3860 (272)
EPC Target Carbon Dioxide Emission Rate (TER)			14.6600 (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	2918.6470	1.1300	3298.0711 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2816.7715	1.1300	3182.9518 (278)
Space and water heating			6481.0229 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	183.8257	1.5338	281.9580 (282)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-384.4968	1.4921	-573.6900
PV Unit electricity exported	-266.2987	0.4592	-122.2728
Total			-695.9628 (283)
Total Primary energy kWh/year			6197.1189 (286)
Target Primary Energy Rate (TPER)			78.4400 (287)