

Full SAP Calculation Printout



Plot Reference	UNIT 12			Issued on Date	08/07/2026
Assessment Reference	001	Plot Type Ref	UNIT 12		
Plot Address	UNIT 12, Stoney Wood Quarter, 34 The Fairway, LONDON, NW7 3HS			SAP Version	10.2
SAP Rating	84 B	DER	15.21	TER	16.35
Environmental	90 B	% DER < TER			6.97
CO ₂ Emissions (t/year)	0.76	DFEE	36.10	TFEE	39.59
Compliance Check	See BREL	% DFEE < TFEE			8.82
% DPER < TPER	1.65	DPER	86.08	TPER	87.53
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	53.9000 (1b)	2.7500 (2b)	148.2250 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	53.9000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	148.2250 (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	3 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.7750 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.1162 (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	0.1482	0.1453	0.1424	0.1279	0.1250	0.1104	0.1104	0.1075	0.1162	0.1250	0.1308	0.1366 (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	0.2432	0.2403	0.2374	0.2229	0.2200	0.2054	0.2054	0.2025	0.2112	0.2200	0.2258	0.2316 (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							
dl			2.1000	1.0000	2.1000		(26)
l			26.1800	0.7940	20.7858		(27)
exposed wall	47.3000	28.2800	19.0200	0.1500	2.8530	60.0000	1141.2000 (29a)
corridor wall	3.5750		3.5750	0.3100	1.1083	14.0000	50.0500 (29a)
flat roof	53.9000		53.9000	0.1000	5.3900	9.0000	485.1000 (30)
Total net area of external elements Aum(A, m ²)			104.7750				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	32.2371		(33)
Main dwelling							
pw			28.6000	0.0000	0.0000	110.0000	3146.0000 (32)
pf			53.9000			40.0000	2156.0001 (32d)
iw			128.1500			9.0000	1153.3499 (32c)
Heat capacity Cm = Sum(A x k)					(28)...(30) + (32) + (32a)...(32e) =		8131.7000 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							150.8664 (35)
List of Thermal Bridges							

Ventilation heat loss calculated monthly (39)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	11.8969	11.7547	11.6125	10.9018	10.7596	10.0488	10.0488	9.9067	10.3331	10.7596	11.0439	11.3282 (38)
Heat transfer coeff												
	57.9239	57.7818	57.6396	56.9288	56.7867	56.0759	56.0759	55.9337	56.3602	56.7867	57.0710	57.3553 (39)
Average = Sum(39)m / 12 =												56.8933
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	1.0747	1.0720	1.0694	1.0562	1.0536	1.0404	1.0404	1.0377	1.0456	1.0536	1.0588	1.0641 (40)
HLP (average)												1.0555
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

Assumed occupancy													1.8051 (42)
Hot water usage for mixer showers	54.4845	53.6657	52.4725	50.1897	48.5050	46.6262	45.5583	46.7424	48.0404	50.0577	52.3896	54.2757 (42a)	
Hot water usage for baths	23.5533	23.2035	22.7109	21.8027	21.1226	20.3685	19.9612	20.4503	20.9829	21.7898	22.7168	23.4737 (42b)	
Hot water usage for other uses	33.1156	31.9114	30.7072	29.5030	28.2988	27.0946	27.0946	28.2988	29.5030	30.7072	31.9114	33.1156 (42c)	
Average daily hot water use (litres/day)												102.1757 (43)	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	111.1535	108.7807	105.8907	101.4954	97.9264	94.0893	92.6141	95.4916	98.5264	102.5547	107.0178	110.8651 (44)	
Energy content (annual)	176.0399	154.9022	162.7501	138.9421	131.8278	115.6938	112.0087	118.2385	121.4929	139.1658	152.4665	173.5879 (45)	
Distribution loss (46)m = 0.15 x (45)m										Total = Sum(45)m =		1697.1161	
Water storage loss (or HIU loss):	26.4060	23.2353	24.4125	20.8413	19.7742	17.3541	16.8013	17.7358	18.2239	20.8749	22.8700	26.0382 (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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)	
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)	
Combi loss	50.9589	46.0274	50.9589	49.3151	49.9022	46.4002	47.1951	48.6615	48.5883	50.9589	49.3151	50.9589 (61)	
Total heat required for water heating calculated for each month	226.9988	200.9296	213.7090	188.2572	181.7300	162.0940	159.2039	166.9000	170.0812	190.1247	201.7815	224.5468 (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	226.9988	200.9296	213.7090	188.2572	181.7300	162.0940	159.2039	166.9000	170.0812	190.1247	201.7815	224.5468 (64)	
12Total per year (kWh/year)										Total per year (kWh/year) = Sum(64)m =		2286.3567 (64a)	
Electric shower(s)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)	
												0.0000 (64a)	
Heat gains from water heating, kWh/month	71.2730	63.0118	66.8541	58.5270	56.3083	50.0682	49.0417	51.4797	52.5435	59.0124	63.0239	70.4577 (65)	

Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	90.2531	90.2531	90.2531	90.2531	90.2531	90.2531	90.2531	90.2531	90.2531	90.2531	90.2531	90.2531 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	79.3632	87.8664	79.3632	82.0086	79.3632	82.0086	79.3632	79.3632	82.0086	79.3632	82.0086	79.3632 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	157.3464	158.9792	154.8647	146.1054	135.0483	124.6562	117.7137	116.0809	120.1954	128.9547	140.0118	150.4039 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	32.0253	32.0253	32.0253	32.0253	32.0253	32.0253	32.0253	32.0253	32.0253	32.0253	32.0253	32.0253 (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)	-72.2025	-72.2025	-72.2025	-72.2025	-72.2025	-72.2025	-72.2025	-72.2025	-72.2025	-72.2025	-72.2025	-72.2025 (71)
Water heating gains (Table 5)	95.7970	93.7676	89.8577	81.2875	75.6832	69.5392	65.9162	69.1931	72.9770	79.3177	87.5331	94.7012 (72)
Total internal gains	385.5826	393.6891	377.1615	362.4775	343.1706	326.2800	313.0691	314.7132	325.2570	340.7116	362.6295	377.5442 (73)

[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			
Southeast				10.8700	36.7938	0.5300	0.7000	0.7700	102.8281 (77)			
South				8.2000	46.7521	0.5300	0.7000	0.7700	98.5648 (78)			
Southwest				7.1100	36.7938	0.5300	0.7000	0.7700	67.2592 (79)			
Solar gains	268.6521	451.1453	602.0348	723.5719	792.3285	779.2356	754.2854	703.7104	644.0276	494.3147	320.5582	230.7283 (83)

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Total gains 654.2346 844.8344 979.1963 1086.0493 1135.4992 1105.5156 1067.3544 1018.4235 969.2847 835.0262 683.1878 608.2725 (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	38.9961	39.0920	39.1884	39.6777	39.7770	40.2812	40.2812	40.3836	40.0780	39.7770	39.5789	39.3827	
alpha	3.5997	3.6061	3.6126	3.6452	3.6518	3.6854	3.6854	3.6922	3.6719	3.6518	3.6386	3.6255	
util living area	0.9051	0.8189	0.7174	0.5841	0.4495	0.3211	0.2304	0.2515	0.3927	0.6342	0.8388	0.9210 (86)	
MIT	19.8909	20.2947	20.6055	20.8381	20.9472	20.9885	20.9974	20.9964	20.9754	20.8187	20.3462	19.8043 (87)	
Th 2	20.0216	20.0238	20.0259	20.0368	20.0389	20.0498	20.0498	20.0520	20.0455	20.0389	20.0346	20.0303 (88)	
util rest of house	0.8904	0.7959	0.6867	0.5466	0.4069	0.2747	0.1810	0.2001	0.3411	0.5897	0.8137	0.9084 (89)	
MIT 2	18.7771	19.2591	19.6186	19.8827	19.9950	20.0424	20.0487	20.0503	20.0284	19.8727	19.3402	18.6783 (90)	
Living area fraction									fLA = Living area / (4) =				0.2968 (91)
MIT	19.1077	19.5665	19.9116	20.1663	20.2777	20.3232	20.3303	20.3312	20.3095	20.1535	19.6388	19.0126 (92)	
Temperature adjustment												-0.1500	
adjusted MIT	18.9577	19.4165	19.7616	20.0163	20.1277	20.1732	20.1803	20.1812	20.1595	20.0035	19.4888	18.8626 (93)	

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8715	0.7801	0.6778	0.5457	0.4109	0.2808	0.1878	0.2072	0.3473	0.5880	0.7977	0.8899 (94)
Useful gains	570.1343	659.0373	663.7336	592.6966	466.5593	310.3886	200.4251	210.9900	336.6778	491.0047	544.9592	541.2973 (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	849.0325	838.7900	764.3921	632.8387	478.5785	312.5248	200.7704	211.4959	341.5148	533.9962	707.0439	840.9759 (97)
Space heating kWh	207.5003	120.7938	74.8899	28.9023	8.9423	0.0000	0.0000	0.0000	0.0000	31.9857	116.7010	222.9609 (98a)
Space heating requirement - total per year (kWh/year)												812.6761
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	207.5003	120.7938	74.8899	28.9023	8.9423	0.0000	0.0000	0.0000	0.0000	31.9857	116.7010	222.9609 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												812.6761
Space heating per m2										(98c) / (4) =		15.0775 (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 %)												88.9000 (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	207.5003	120.7938	74.8899	28.9023	8.9423	0.0000	0.0000	0.0000	0.0000	31.9857	116.7010	222.9609 (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)	233.4086	135.8760	84.2407	32.5111	10.0588	0.0000	0.0000	0.0000	0.0000	35.9794	131.2722	250.7996 (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	226.9988	200.9296	213.7090	188.2572	181.7300	162.0940	159.2039	166.9000	170.0812	190.1247	201.7815	224.5468 (64)
Efficiency of water heater	84.1894	83.3265	82.3677	81.3474	80.6660	80.3000	80.3000	80.3000	80.3000	81.4345	83.2510	80.3000 (216)
Fuel for water heating, kWh/month	269.6287	241.1353	259.4574	231.4239	225.2870	201.8605	198.2613	207.8455	211.8072	233.4696	242.3772	84.3662 (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	14.1257	12.7587	14.1257	13.6700	14.1257	13.6700	14.1257	14.1257	13.6700	14.1257	13.6700	14.1257 (231)
Lighting	16.4901	13.2290	11.9112	8.7267	6.7407	5.5072	6.1491	7.9929	10.3819	13.6217	15.3856	16.9484 (232)
Electricity generated by PVs (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235c)
Electricity generated by PVs (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235d)
Annual totals kWh/year												
Space heating fuel - main system 1												914.1463 (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												2788.7108 (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)												125.3183 (230a)
central heating pump												41.0000 (230c)

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Total electricity for the above, kWh/year	166.3183	(231)
Electricity for lighting (calculated in Appendix L)	133.0846	(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	4002.2600	(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	914.1463	0.2100	191.9707 (261)
Total CO2 associated with community systems			0.0000 (273)
Water heating (other fuel)	2788.7108	0.2100	585.6293 (264)
Space and water heating			777.6000 (265)
Pumps, fans and electric keep-hot	166.3183	0.1387	23.0704 (267)
Energy for lighting	133.0846	0.1443	19.2082 (268)
Total CO2, kg/year			819.8786 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			15.2100 (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	914.1463	1.1300	1032.9853 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2788.7108	1.1300	3151.2432 (278)
Space and water heating			4184.2285 (279)
Pumps, fans and electric keep-hot	166.3183	1.5128	251.6063 (281)
Energy for lighting	133.0846	1.5338	204.1296 (282)
Total Primary energy kWh/year			4639.9645 (286)
Dwelling Primary energy Rate (DPER)			86.0800 (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	53.9000	2.7500	148.2250
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	53.9000		148.2250
Dwelling volume			148.2250

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) = 0.1349 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	5.0000 (17)
Infiltration rate	0.3849 (18)
Number of sides sheltered	3 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.7750 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.2983 (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	0.3804	0.3729	0.3654	0.3282	0.3207	0.2834	0.2834	0.2759	0.2983	0.3207	0.3356	0.3505 (22b)
Effective ac	0.5723	0.5695	0.5668	0.5538	0.5514	0.5402	0.5402	0.5381	0.5445	0.5514	0.5563	0.5614 (25)

3. Heat losses and heat loss parameter

Element	Gross	Openings	NetArea	U-value	A x U	K-value	A x K
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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		
Southeast				4.7300	36.7938	0.6300	0.7000	0.7700		53.1873 (77)		
South				3.5600	46.7521	0.6300	0.7000	0.7700		50.8654 (78)		
Southwest				3.0800	36.7938	0.6300	0.7000	0.7700		34.6336 (79)		
Solar gains	138.6863	232.8959	310.7927	373.5385	409.0369	402.2791	389.3980	363.2865	332.4723	255.1821	165.4821	119.1088 (83)
Total gains	524.4621	626.7989	688.1474	736.2156	752.4007	728.7588	702.6603	678.1928	657.9290	596.0869	528.3112	496.8462 (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	32.2289	32.2922	32.3545	32.6503	32.7063	32.9693	32.9693	33.0184	32.8675	32.7063	32.5933	32.4760
alpha	3.1486	3.1528	3.1570	3.1767	3.1804	3.1980	3.1980	3.2012	3.1912	3.1804	3.1729	3.1651
util living area	0.9543	0.9234	0.8815	0.8069	0.6976	0.5481	0.4122	0.4418	0.6259	0.8263	0.9269	0.9605 (86)
MIT	19.1336	19.4740	19.8683	20.3201	20.6713	20.8905	20.9668	20.9578	20.8251	20.3682	19.6757	19.0694 (87)
Th 2	19.8406	19.8426	19.8446	19.8538	19.8555	19.8635	19.8635	19.8650	19.8604	19.8555	19.8520	19.8484 (88)
util rest of house	0.9454	0.9093	0.8598	0.7714	0.6418	0.4670	0.3126	0.3416	0.5479	0.7867	0.9110	0.9528 (89)
MIT 2	17.7196	18.1425	18.6276	19.1722	19.5670	19.7906	19.8493	19.8456	19.7331	19.2437	18.4079	17.6443 (90)
Living area fraction	18.1393	18.5378	18.9959	19.5129	19.8948	20.1171	20.1810	20.1757	20.0573	19.5775	18.7843	18.0673 (92)
Temperature adjustment												0.0000
adjusted MIT	18.1393	18.5378	18.9959	19.5129	19.8948	20.1171	20.1810	20.1757	20.0573	19.5775	18.7843	18.0673 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9281	0.8894	0.8407	0.7595	0.6439	0.4860	0.3412	0.3699	0.5623	0.7755	0.8922	0.9366 (94)
Useful gains	486.7662	557.4999	578.5415	559.1876	484.4819	354.1821	239.7587	250.8964	369.9790	462.2910	471.3592	465.3434 (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	969.9480	953.9490	872.3914	734.2214	565.9587	377.9877	245.3455	258.3002	409.4120	620.0191	809.7517	964.5149 (97)
Space heating kWh	359.4873	266.4138	218.6243	126.0243	60.6188	0.0000	0.0000	0.0000	0.0000	117.3497	243.6426	371.3836 (98a)
Space heating requirement - total per year (kWh/year)												1763.5444
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	359.4873	266.4138	218.6243	126.0243	60.6188	0.0000	0.0000	0.0000	0.0000	117.3497	243.6426	371.3836 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1763.5444
Space heating per m2										(98c) / (4) =		32.7188 (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	359.4873	266.4138	218.6243	126.0243	60.6188	0.0000	0.0000	0.0000	0.0000	117.3497	243.6426	371.3836 (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)	389.0555	288.3266	236.6064	136.3899	65.6048	0.0000	0.0000	0.0000	0.0000	127.0019	263.6825	401.9303 (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	202.0908	178.9007	190.6416	169.1565	163.9288	146.8614	144.9257	151.7166	154.3210	171.5451	180.7332	200.1001 (64)
Efficiency of water heater (217)m	85.6009	85.2328	84.6757	83.7594	82.4533	80.3000	80.3000	80.3000	80.3000	83.5845	85.0221	85.6868 (216)
Fuel for water heating, kWh/month	236.0849	209.8966	225.1432	201.9553	198.8142	182.8910	180.4804	188.9373	192.1806	205.2357	212.5721	233.5250 (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	16.5302	13.2612	11.9402	8.7479	6.7571	5.5206	6.1641	8.0123	10.4072	13.6548	15.4231	16.9897 (232)
Electricity generated by PVs (Appendix M) (negative quantity) (233a)m	-12.0407	-18.1104	-27.7568	-33.3531	-37.8881	-36.0898	-35.6650	-32.7125	-27.8486	-21.6391	-13.6386	-10.2827 (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	-3.7434	-8.0963	-16.5101	-25.4198	-34.2230	-34.5982	-34.1774	-28.6449	-20.6246	-11.7646	-5.0577	-2.9431 (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)												

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(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												1908.5979	(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												2467.7162	(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)												133.4086	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation												-532.8285	(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												4062.8941	(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	1908.5979	0.2100	400.8055 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	2467.7162	0.2100	518.2204 (264)
Space and water heating			919.0260 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	133.4086	0.1443	19.2550 (268)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-307.0253	0.1332	-40.9072
PV Unit electricity exported	-225.8032	0.1252	-28.2677
Total			-69.1749 (269)
Total CO2, kg/year			881.0353 (272)
EPC Target Carbon Dioxide Emission Rate (TER)			16.3500 (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	1908.5979	1.1300	2156.7156 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2467.7162	1.1300	2788.5193 (278)
Space and water heating			4945.2349 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	133.4086	1.5338	204.6265 (282)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-307.0253	1.4923	-458.1875
PV Unit electricity exported	-225.8032	0.4595	-103.7545
Total			-561.9421 (283)
Total Primary energy kWh/year			4718.0202 (286)
Target Primary Energy Rate (TPER)			87.5300 (287)