

Full SAP Calculation Printout



Plot Reference	UNIT 03			Issued on Date	08/07/2026
Assessment Reference	001	Plot Type Ref	UNIT 03		
Plot Address	UNIT 03, Stoney Wood Quarter, 34 The Fairway, LONDON, NW7 3HS			SAP Version	10.2
SAP Rating	81 B	DER	3.87	TER	16.24
Environmental	97 A	% DER < TER			76.17
CO ₂ Emissions (t/year)	0.26	DFEE	37.13	TFEE	43.40
Compliance Check	See BREL	% DFEE < TFEE			14.43
% DPER < TPER	53.01	DPER	41.23	TPER	87.74
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 FABRIC ENERGY EFFICIENCY

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Basement floor	39.1000 (1a)	x 2.9000 (2a)	= 113.3900 (1a) - (3a)
Ground floor	32.6000 (1b)	x 2.8000 (2b)	= 91.2800 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	71.7000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 204.6700 (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	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) =	Air changes per hour 30.0000 / (5) = 0.1466 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.0000 (17)
Infiltration rate	0.2966 (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) = 0.2298 (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	0.2931	0.2873	0.2816	0.2528	0.2471	0.2184	0.2184	0.2126	0.2298	0.2471	0.2586	0.2701 (22b)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)												0.0000 (23b)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												0.0000 (23c)
Effective ac	0.5429	0.5413	0.5396	0.5320	0.5305	0.5238	0.5238	0.5226	0.5264	0.5305	0.5334	0.5365 (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			1.8900	1.0000	1.8900		(26)
l			30.1500	0.7940	23.9378		(27)
basement floor			39.1000	0.1000	3.9100	110.0000	4300.9998 (28)
exposed wall	85.1500	32.0400	53.1100	0.1500	7.9665	60.0000	3186.6001 (29a)
basement wall	48.1400		48.1400	0.1500	7.2210	9.0000	433.2600 (29a)
Total net area of external elements Aum(A, m ²)			172.3900				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		44.9253		(33)
Main dwelling							
pw			35.1700	0.0000	0.0000	110.0000	3868.6998 (32)
pc			35.9000			30.0000	1077.0000 (32b)
iw			89.9600			9.0000	809.6400 (32c)
if			32.6000			18.0000	586.8000 (32d)
ic			32.6000			9.0000	293.4000 (32e)

Heat capacity Cm = Sum(A x k)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m²K
List of Thermal Bridges

(28)...(30) + (32) + (32a)...(32e) = 14556.3997 (34)
203.0181 (35)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan 36.6708	Feb 36.5582	Mar 36.4478	Apr 35.9293	May 35.8323	Jun 35.3807	Jul 35.3807	Aug 35.2971	Sep 35.5546	Oct 35.8323	Nov 36.0285	Dec 36.2337 (38)
Heat transfer coeff	90.1512	90.0385	89.9281	89.4096	89.3126	88.8610	88.8610	88.7774	89.0350	89.3126	89.5089	89.7141 (39)
Average = Sum(39)m / 12 =												89.4092
HLP	Jan 1.2573	Feb 1.2558	Mar 1.2542	Apr 1.2470	May 1.2456	Jun 1.2393	Jul 1.2393	Aug 1.2382	Sep 1.2418	Oct 1.2456	Nov 1.2484	Dec 1.2512 (40)
HLP (average)												1.2470
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

Assumed occupancy												2.2867 (42)
Hot water usage for mixer showers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42a)
Hot water usage for baths	27.0260	26.6246	26.0594	25.0172	24.2369	23.3716	22.9042	23.4654	24.0766	25.0024	26.0661	26.9346 (42b)
Hot water usage for other uses	38.0479	36.6643	35.2808	33.8972	32.5136	31.1301	31.1301	32.5136	33.8972	35.2808	36.6643	38.0479 (42c)
Average daily hot water use (litres/day)												59.6463 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	65.0738	63.2889	61.3401	58.9144	56.7505	54.5016	54.0343	55.9791	57.9738	60.2832	62.7304	64.9825 (44)
Energy content (annual)	103.0611	90.1226	84.2775	80.6509	76.3971	67.0161	65.3498	69.3138	71.4874	81.8037	89.3709	101.7469 (45)
Distribution loss (46)m = 0.15 x (45)m										Total = Sum(45)m =		990.5978
Water storage loss (or HIU 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 (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	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	87.6019	76.6042	80.1359	68.5533	64.9375	56.9637	55.5473	58.9167	60.7643	69.5332	75.9653	86.4848 (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	87.6019	76.6042	80.1359	68.5533	64.9375	56.9637	55.5473	58.9167	60.7643	69.5332	75.9653	86.4848 (64)
12Total per year (kWh/year)									Total per year (kWh/year) = Sum(64)m =			842.0081 (64)
Electric shower(s)	50.0999	44.6395	48.7446	46.5163	47.3892	45.2047	46.7115	47.3892	46.5163	48.7446	47.8280	50.0999 (64a)
												569.8838 (64a)
Heat gains from water heating, kWh/month	34.4255	30.3109	32.2201	28.7674	28.0817	25.5421	25.5647	26.5765	26.8202	29.5694	30.9483	34.1462 (65)

Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	101.4983	112.3731	101.4983	104.8816	101.4983	104.8816	101.4983	101.4983	104.8816	101.4983	104.8816	101.4983 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	201.2318	203.3199	198.0578	186.8555	172.7145	159.4240	150.5451	148.4570	153.7190	164.9214	179.0624	192.3529 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334 (69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672 (71)
Water heating gains (Table 5)	46.2708	45.1055	43.3066	39.9547	37.7442	35.4751	34.3612	35.7211	37.2502	39.7439	42.9838	45.8954 (72)
Total internal gains	406.3010	418.0988	400.1629	388.9920	369.2572	357.0809	343.7048	342.9765	353.1511	363.4638	384.2279	397.0468 (73)

[Jan]				Area m ²	Solar flux Table 6a W/m ²	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W			
Southwest				20.9600	36.7938	0.5300	0.7000	0.7700	198.2775 (79)			
Northwest				9.1900	11.2829	0.5300	0.7000	0.7700	26.6591 (81)			
Solar gains	224.9366	392.0052	559.8793	733.1418	857.1645	866.7943	829.0952	734.1488	619.5008	439.5911	271.0347	191.4554 (83)
Total gains	631.2376	810.1040	960.0422	1122.1338	1226.4217	1223.8752	1172.7999	1077.1253	972.6518	803.0548	655.2627	588.5022 (84)

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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	44.8518	44.9079	44.9631	45.2238	45.2729	45.5030	45.5030	45.5459	45.4141	45.2729	45.1737	45.0704
alpha	3.9901	3.9939	3.9975	4.0149	4.0182	4.0335	4.0335	4.0364	4.0276	4.0182	4.0116	4.0047
util living area	0.9817	0.9543	0.9010	0.7857	0.6241	0.4531	0.3307	0.3744	0.5910	0.8544	0.9623	0.9858 (86)
MIT	19.4794	19.8383	20.2460	20.6556	20.8878	20.9756	20.9946	20.9912	20.9320	20.5823	19.9448	19.4066 (87)
Th 2	19.8744	19.8756	19.8769	19.8826	19.8837	19.8887	19.8887	19.8896	19.8867	19.8837	19.8815	19.8792 (88)
util rest of house	0.9769	0.9434	0.8788	0.7439	0.5635	0.3790	0.2485	0.2863	0.5096	0.8133	0.9513	0.9820 (89)
MIT 2	18.5228	18.8726	19.2597	19.6295	19.8150	19.8781	19.8873	19.8871	19.8531	19.5808	18.9860	18.4549 (90)
Living area fraction	fLA = Living area / (4) =											
MIT	18.9137	19.2673	19.6628	20.0488	20.2534	20.3266	20.3398	20.3383	20.2940	19.9901	19.3778	18.8438 (92)
Temperature adjustment	0.0000											
adjusted MIT	18.9137	19.2673	19.6628	20.0488	20.2534	20.3266	20.3398	20.3383	20.2940	19.9901	19.3778	18.8438 (93)

8. Space heating requirement												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9716	0.9362	0.8739	0.7506	0.5842	0.4087	0.2821	0.3223	0.5405	0.8177	0.9452	0.9774 (94)
Useful gains	613.3272	758.4082	839.0130	842.2883	716.5246	500.1379	330.8468	347.1058	525.6979	656.6579	619.3328	575.2314 (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	1317.4436	1293.6062	1183.7035	996.8102	763.9273	508.8707	332.3211	349.6309	551.4802	838.6504	1098.9747	1313.7550 (97)
Space heating kWh	523.8626	359.6531	256.4498	111.2558	35.2676	0.0000	0.0000	0.0000	0.0000	135.4024	345.3422	549.4616 (98a)
Space heating requirement - total per year (kWh/year)	2316.6951											
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	523.8626	359.6531	256.4498	111.2558	35.2676	0.0000	0.0000	0.0000	0.0000	135.4024	345.3422	549.4616 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)	2316.6951											
Space heating per m2	(98c) / (4) = 32.3110 (99)											

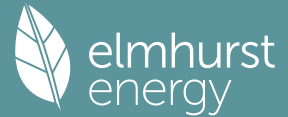
8c. Space cooling requirement												
Calculated for June, July and August. See Table 10b												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ext. temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000
Heat loss rate W	0.0000	0.0000	0.0000	0.0000	0.0000	835.2937	657.5716	674.7083	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9448	0.9699	0.9574	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	789.2067	637.8068	645.9616	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	1392.1787	1334.4639	1224.6081	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	434.1398	518.3129	430.5130	0.0000	0.0000	0.0000	0.0000 (104)
Cooled fraction	fc = cooled area / (4) =											
Intermittency factor (Table 10b)	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500 (105)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	108.5350	129.5782	107.6282	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement	345.7414 (107)											
Energy for space heating	32.3110 (99)											
Energy for space cooling	4.8221 (108)											
Total	37.1330 (109)											
Fabric Energy Efficiency (DFEE)	37.1 (109)											

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

1. Overall dwelling characteristics												
Main dwelling	Area (m2)	Storey height (m)	Volume (m3)									
Basement floor	39.1000 (1a)	x	2.9000 (2a)	=	113.3900 (1a) - (3a)							
Ground floor	32.6000 (1b)	x	2.8000 (2b)	=	91.2800 (1b) - (3b)							
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	71.7000				(4)							
Dwelling volume	(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =				204.6700 (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)

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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) =
Pressure test
Pressure Test Method
Measured/design AP50
Infiltration rate
Number of sides sheltered

Air changes per hour
30.0000 / (5) = 0.1466 (8)
Yes
Blower Door
5.0000 (17)
0.3966 (18)
3 (19)

Shelter factor (20) = 1 - [0.075 x (19)] = 0.7750 (20)
Infiltration rate adjusted to include shelter factor (21) = (18) x (20) = 0.3073 (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	0.3919	0.3842	0.3765	0.3381	0.3304	0.2920	0.2920	0.2843	0.3073	0.3304	0.3458	0.3611 (22b)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)												0.0000 (23b)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												0.0000 (23c)
Effective ac	0.5768	0.5738	0.5709	0.5571	0.5546	0.5426	0.5426	0.5404	0.5472	0.5546	0.5598	0.5652 (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			1.8900	1.0000	1.8900		(26)
TER Opening Type			16.0300	1.1450	18.3550		(27)
basement floor			39.1000	0.1300	5.0830		(28)
exposed wall	85.1500	17.9200	67.2300	0.1800	12.1014		(29a)
basement wall	48.1400		48.1400	0.1800	8.6652		(29a)
Total net area of external elements Aum(A, m2)			172.3900				(31)
Fabric heat loss, W/K = Sum (A x U)				(26) ... (30) + (32) =	46.0946		(33)
Main dwelling							
pw			35.1700	0.0000	0.0000		(32)

Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K 203.0181 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total
E2 Other lintels (including other steel lintels)	12.3500	0.0500	0.6175
E3 Sill	11.4500	0.0500	0.5725
E4 Jamb	35.2000	0.0500	1.7600
E5 Ground floor (normal)	8.7000	0.1600	1.3920
E22 Basement floor	16.6000	0.0700	1.1620
E6 Intermediate floor within a dwelling	6.1000	0.0000	0.0000
E7 Party floor between dwellings (in blocks of flats)	22.8000	0.0700	1.5960
E16 Corner (normal)	8.6000	0.0900	0.7740
E17 Corner (inverted - internal area greater than external area)	5.7000	-0.0900	-0.5130
E18 Party wall between dwellings	14.2000	0.0600	0.8520
E25 Staggered party wall between dwellings	5.7000	0.0600	0.3420

Thermal bridges (Sum(L x Psi) calculated using Appendix K) 8.5550 (36)

Point Thermal bridges

Total fabric heat loss (33) + (36) + (36a) = 54.6496 (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	38.9564	38.7550	38.5576	37.6305	37.4571	36.6496	36.6496	36.5000	36.9606	37.4571	37.8080	38.1748 (38)
Heat transfer coeff	93.6059	93.4046	93.2072	92.2801	92.1066	91.2991	91.2991	91.1496	91.6102	92.1066	92.4575	92.8244 (39)
Average = Sum(39)m / 12 =												92.2792

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.3055	1.3027	1.3000	1.2870	1.2846	1.2733	1.2733	1.2713	1.2777	1.2846	1.2895	1.2946 (40)
HLP (average)												1.2870
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.2867 (42)
Hot water usage for mixer showers												
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(42a)
Hot water usage for baths												
27.0260	26.6246	26.0594	25.0172	24.2369	23.3716	22.9042	23.4654	24.0766	25.0024	26.0661	26.9346	(42b)
Hot water usage for other uses												
38.0479	36.6643	35.2808	33.8972	32.5136	31.1301	31.1301	32.5136	33.8972	35.2808	36.6643	38.0479	(42c)
Average daily hot water use (litres/day)												59.6463 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	65.0738	63.2889	61.3401	58.9144	56.7505	54.5016	54.0343	55.9791	57.9738	60.2832	62.7304	64.9825 (44)
Energy conte	103.0611	90.1226	94.2775	80.6509	76.3971	67.0161	65.3498	69.3138	71.4874	81.8037	89.3709	101.7469 (45)
Energy content (annual)										Total = Sum(45)m =		990.5978
Distribution loss (46)m = 0.15 x (45)m												
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(46)
Water storage loss (or HIU loss):												
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
If cylinder contains dedicated solar storage												
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(57)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)
Combi loss	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												
87.6019	76.6042	80.1359	68.5533	64.9375	56.9637	55.5473	58.9167	60.7643	69.5332	75.9653	86.4848	(62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63d)
Output from w/h												
87.6019	76.6042	80.1359	68.5533	64.9375	56.9637	55.5473	58.9167	60.7643	69.5332	75.9653	86.4848	(64)
Total per year (kWh/year)										Total per year (kWh/year) = Sum(64)m =		842.0081 (64)
Electric shower(s)												842 (64)
50.0999	44.6395	48.7446	46.5163	47.3892	45.2047	46.7115	47.3892	46.5163	48.7446	47.8280	50.0999	(64a)

Full SAP Calculation Printout



Heat gains from water heating, kWh/month
34.4255 30.3109 32.2201 28.7674 28.0817 25.5421 25.5647 26.5765 26.8202 29.5694 30.9483 34.1462 (65)

Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m = 569.8838 (64a)

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	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340	114.3340	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	101.4932	112.3674	101.4932	104.8763	101.4932	104.8763	101.4932	101.4932	104.8763	101.4932	104.8763	101.4932	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	201.2318	203.3199	198.0578	186.8555	172.7145	159.4240	150.5451	148.4570	153.7190	164.9214	179.0624	192.3529	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334	34.4334	(69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	-91.4672	(71)
Water heating gains (Table 5)	46.2708	45.1055	43.3066	39.9547	37.7442	35.4751	34.3612	35.7211	37.2502	39.7439	42.9838	45.8954	(72)
Total internal gains	406.2959	418.0930	400.1578	388.9866	369.2520	357.0756	343.6996	342.9714	353.1457	363.4586	384.2226	397.0416	(73)

6. Solar gains

[Jan]				Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W			
Southwest				11.1500	36.7938	0.6300	0.7000		125.3781 (79)			
Northwest				4.8800	11.2829	0.6300	0.7000	0.7700	16.8273 (81)			
Solar gains	142.2054	247.8177	353.9213	463.4103	541.7718	547.8449	524.0232	391.5979	277.8943	171.3472	121.0395 (83)	
Total gains	548.5013	665.9108	754.0791	852.3970	911.0238	904.9205	867.7228	807.0060	744.7437	641.3529	555.5698	518.0812 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation factor for gains for living area, nil,m (see Table 9a)	43.1965	43.2896	43.3813	43.8171	43.8996	44.2879	44.2879	44.3605	44.1375	43.8996	43.7330	43.5602	21.0000 (85)
tau	3.8798	3.8860	3.8921	3.9211	3.9266	3.9525	3.9525	3.9574	3.9425	3.9266	3.9155	3.9040	
alpha	0.9888	0.9760	0.9516	0.8883	0.7718	0.5998	0.4508	0.5001	0.7277	0.9206	0.9784	0.9909	(86)
util living area	19.2651	19.5481	19.9214	20.3869	20.7380	20.9290	20.9820	20.9731	20.8459	20.3728	19.7355	19.2183	(87)
MIT	19.8365	19.8387	19.8409	19.8510	19.8529	19.8618	19.8618	19.8634	19.8584	19.8529	19.8491	19.8450	(88)
util rest of house	0.9857	0.9697	0.9385	0.8584	0.7138	0.5096	0.3399	0.3853	0.6435	0.8925	0.9715	0.9884	(89)
MIT 2	18.2838	18.5640	18.9293	19.3754	19.6812	19.8288	19.8569	19.8553	19.7758	19.3752	18.7595	18.2437	(90)
Living area fraction	18.6848	18.9662	19.3348	19.7887	20.1130	20.2784	20.3167	20.3121	20.2131	19.7829	19.1583	18.6420	(91)
MIT	18.6848	18.9662	19.3348	19.7887	20.1130	20.2784	20.3167	20.3121	20.2131	19.7829	19.1583	18.6420	(92)
Temperature adjustment	18.6848	18.9662	19.3348	19.7887	20.1130	20.2784	20.3167	20.3121	20.2131	19.7829	19.1583	18.6420	(93)
adjusted MIT	18.6848	18.9662	19.3348	19.7887	20.1130	20.2784	20.3167	20.3121	20.2131	19.7829	19.1583	18.6420	(93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9816	0.9635	0.9315	0.8566	0.7281	0.5440	0.3852	0.4320	0.6717	0.8904	0.9661	0.9849	(94)
Useful gains	538.4039	641.6151	702.4206	730.1606	663.2803	492.2821	334.2259	348.5916	500.2708	571.0667	536.7272	510.2391	(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	1346.5063	1313.8455	1196.2913	1004.8134	774.8974	518.4314	339.3272	356.5867	560.0202	845.8040	1114.8847	1340.5666	(97)
Space heating kWh	601.2282	451.7389	367.4398	197.7500	83.0431	0.0000	0.0000	0.0000	0.0000	204.4045	416.2734	617.7637	(98a)
Space heating requirement - total per year (kWh/year)												2939.6416	
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	601.2282	451.7389	367.4398	197.7500	83.0431	0.0000	0.0000	0.0000	0.0000	204.4045	416.2734	617.7637	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												2939.6416	
Space heating per m ²												40.9992	(99)

8c. Space cooling requirement

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Ext. temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	
Heat loss rate W	0.0000	0.0000	0.0000	0.0000	0.0000	858.2118	675.6136	692.7369	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8604	0.9147	0.8903	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	738.3924	617.9502	616.7108	0.0000	0.0000	0.0000	0.0000	(102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	1019.3802	977.8858	908.8896	0.0000	0.0000	0.0000	0.0000	(103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	202.3112	267.7920	217.3810	0.0000	0.0000	0.0000	0.0000	(104)
Cooled fraction									fc = cooled area / (4) =			1.0000	(105)
Intermittency factor (Table 10b)	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	(106)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	50.5778	66.9480	54.3453	0.0000	0.0000	0.0000	0.0000	(107)
Space cooling requirement												171.8711	(107)
Energy for space heating												40.9992	(99)
Energy for space cooling												2.3971	(108)

Total
Fabric Energy Efficiency (TFEE)

43.3963 (109)
43.4 (109)