

Full SAP Calculation Printout



Plot Reference	UNIT 10			Issued on Date	08/07/2026
Assessment Reference	001	Plot Type Ref	UNIT 10		
Plot Address	UNIT 10, Stoney Wood Quarter, 34 The Fairway, LONDON, NW7 3HS			SAP Version	10.2
SAP Rating	81 B	DER	3.93	TER	14.39
Environmental	97 A	% DER < TER			72.69
CO ₂ Emissions (t/year)	0.22	DFEE	34.72	TFEE	33.36
Compliance Check	See BREL	% DFEE < TFEE			-4.06
% DPER < TPER	45.35	DPER	42.03	TPER	76.91
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			
Ground floor	60.6000 (1b)	2.7500 (2b)	166.6500 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	60.6000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	166.6500 (5)

2. Ventilation rate

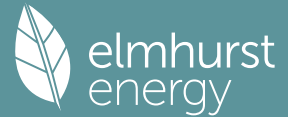
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
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)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) = 0.1200 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.0000 (17)
Infiltration rate	0.2700 (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) = 0.2093 (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)
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	0.2668	0.2616	0.2563	0.2302	0.2250	0.1988	0.1988	0.1936	0.2093	0.2250	0.2354	0.2459 (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	0.5356	0.5342	0.5329	0.5265	0.5253	0.5198	0.5198	0.5187	0.5219	0.5253	0.5277	0.5302 (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)
1			32.8600	0.7940	26.0895		(27)
exposed wall	48.4000	32.8600	15.5400	0.1500	2.3310	60.0000	932.4001 (29a)
corridor wall	19.8000	2.1000	17.7000	0.2500	4.4250	9.0000	159.3000 (29a)
Total net area of external elements Aum(A, m ²)			68.2000				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		34.9455		(33)
Main dwelling							
pw			38.2250	0.0000	0.0000	110.0000	4204.7498 (32)
pf			60.6000			40.0000	2423.9999 (32d)
pc			60.6000			30.0000	1818.0000 (32b)
iw			100.1000			9.0000	900.9000 (32c)
Heat capacity Cm = Sum (A x k)						(28)...(30) + (32) + (32a)...(32e) =	10439.3498 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							172.2665 (35)
List of Thermal Bridges							
K1 Element				Length	Psi-value	Total	
E2 Other lintels (including other steel lintels)				12.9500	0.0500	0.6475	
E3 Sill				11.9500	0.0500	0.5975	

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E4 Jamb	42.7000	0.0500	2.1350
E7 Party floor between dwellings (in blocks of flats)	34.5000	0.0700	2.4150
E23 Balcony within or between dwellings, balcony support penetrates wall insulation	14.9000	0.0200	0.2980
E16 Corner (normal)	11.0000	0.0900	0.9900
E17 Corner (inverted - internal area greater than external area)	8.2500	-0.0900	-0.7425
E18 Party wall between dwellings	11.0000	0.0600	0.6600
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			7.0005 (36)
Point Thermal bridges			0.0000
Total fabric heat loss		(33) + (36) + (36a) =	41.9460 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan 29.4546	Feb 29.3786	Mar 29.3041	Apr 28.9542	May 28.8887	Jun 28.5839	Jul 28.5839	Aug 28.5275	Sep 28.7013	Oct 28.8887	Nov 29.0212	Dec 29.1596 (38)
Heat transfer coeff	71.4006	71.3246	71.2501	70.9002	70.8347	70.5299	70.5299	70.4735	70.6473	70.8347	70.9671	71.1056 (39)
Average = Sum(39)m / 12 =												70.8998
HLP	Jan 1.1782	Feb 1.1770	Mar 1.1757	Apr 1.1700	May 1.1689	Jun 1.1639	Jul 1.1639	Aug 1.1629	Sep 1.1658	Oct 1.1689	Nov 1.1711	Dec 1.1734 (40)
HLP (average)												1.1700
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)												
Assumed occupancy												1.9985 (42)
Hot water usage for mixer showers												0.0000 (42a)
Hot water usage for baths	24.9484	24.5779	24.0561	23.0941	22.3737	21.5749	21.1435	21.6616	22.2257	23.0805	24.0623	24.8641 (42b)
Hot water usage for other uses	35.0971	33.8209	32.5446	31.2683	29.9921	28.7158	28.7158	29.9921	31.2683	32.5446	33.8209	35.0971 (42c)
Average daily hot water use (litres/day)												55.0376 (43)
Daily hot water use	60.0456	58.3988	56.6007	54.3624	52.3658	50.2908	49.8593	51.6537	53.4941	55.6251	57.8832	59.9612 (44)
Energy conte	95.0975	83.1591	86.9932	74.4195	70.4944	61.8384	60.3005	63.9581	65.9636	75.4827	82.4652	93.8848 (45)
Energy content (annual)										Total = Sum(45)m =		914.0569
Distribution 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)
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												
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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)
Total heat required for water heating calculated for each month	80.8329	70.6852	73.9443	63.2565	59.9203	52.5626	51.2554	54.3644	56.0690	64.1603	70.0954	79.8021 (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	80.8329	70.6852	73.9443	63.2565	59.9203	52.5626	51.2554	54.3644	56.0690	64.1603	70.0954	79.8021 (64)
12Total per year (kWh/year)								Total per year (kWh/year) = Sum(64)m =				776.9484 (64)
Electric shower(s)	46.2310	41.1922	44.9803	42.9242	43.7296	41.7138	43.1043	43.7296	42.9242	44.9803	44.1345	46.2310 (64a)
Heat gains from water heating, kWh/month	31.7660	27.9694	29.7311	26.5452	25.9125	23.5691	23.5899	24.5235	24.7483	27.2852	28.5575	31.5083 (65)

5. Internal gains (see Table 5 and 5a)												
Metabolic gains (Table 5), Watts												
(66)m	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	87.9938	87.9938	87.9938	87.9938	87.9938	87.9938	87.9938	87.9938	87.9938	87.9938	87.9938	87.9938 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	174.4576	176.2679	171.7059	161.9941	149.7346	138.2124	130.5149	128.7045	133.2665	142.9784	155.2379	166.7600 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927 (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)	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419 (71)
Water heating gains (Table 5)	42.6962	41.6211	39.9612	36.8683	34.8286	32.7349	31.7069	32.9617	34.3726	36.6736	39.6632	42.3498 (72)
Total internal gains	358.1258	368.2889	352.6392	342.7675	325.5352	314.8524	303.1938	302.6382	311.5443	320.6240	338.8062	350.0819 (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	
Northeast	16.6400		11.2829		0.5300		0.7000		0.7700		48.2706 (75)	
East	2.0600		19.6403		0.5300		0.7000		0.7700		10.4021 (76)	
Southeast	14.1600		36.7938		0.5300		0.7000		0.7700		133.9508 (77)	

Solar gains	192.6235	346.7728	522.7271	726.4203	883.9612	908.0802	862.8194	740.8972	592.7196	396.3964	234.1493	162.6084 (83)
Total gains	550.7493	715.0617	875.3663	1069.1878	1209.4964	1222.9326	1166.0132	1043.5354	904.2639	717.0204	572.9555	512.6903 (84)

7. Mean internal temperature (heating season)												
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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	40.6134	40.6566	40.6992	40.9000	40.9378	41.1147	41.1147	41.1477	41.0464	40.9378	40.8614	40.7819
alpha	3.7076	3.7104	3.7133	3.7267	3.7292	3.7410	3.7410	3.7432	3.7364	3.7292	3.7241	3.7188
util living area	0.9685	0.9271	0.8477	0.6945	0.5174	0.3635	0.2648	0.3080	0.5130	0.7991	0.9400	0.9750 (86)
MIT	19.4648	19.8689	20.3216	20.7307	20.9230	20.9839	20.9962	20.9934	20.9449	20.6177	19.9548	19.3797 (87)
Th 2	19.9375	19.9385	19.9395	19.9441	19.9450	19.9490	19.9490	19.9498	19.9475	19.9450	19.9432	19.9414 (88)
util rest of house	0.9617	0.9131	0.8217	0.6527	0.4658	0.3059	0.2022	0.2389	0.4432	0.7560	0.9258	0.9695 (89)
MIT 2	18.5704	18.9605	19.3840	19.7453	19.8967	19.9415	19.9479	19.9476	19.9187	19.6650	19.0541	18.4901 (90)
Living area fraction									fLA = Living area / (4) =			0.5660 (91)
MIT	19.0766	19.4746	19.9147	20.3030	20.4776	20.5315	20.5413	20.5396	20.4995	20.2043	19.5639	18.9936 (92)
Temperature adjustment												0.0000
adjusted MIT	19.0766	19.4746	19.9147	20.3030	20.4776	20.5315	20.5413	20.5396	20.4995	20.2043	19.5639	18.9936 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9550	0.9060	0.8210	0.6674	0.4922	0.3380	0.2375	0.2778	0.4805	0.7674	0.9198	0.9634 (94)
Useful gains	525.9468	647.8370	718.6818	713.5889	595.3583	413.3397	276.9843	289.9436	434.4895	550.2069	526.9938	493.9062 (95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000 (96)
Heat loss rate W	1055.0594	1039.5307	955.7971	808.4749	621.7589	418.3470	277.9768	291.7287	452.1082	680.3145	884.5291	1051.9110 (97)
Space heating kWh	393.6598	263.2182	176.4138	68.3179	19.6420	0.0000	0.0000	0.0000	0.0000	96.8000	257.4254	415.1556 (98a)
Space heating requirement - total per year (kWh/year)												1690.6326
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	393.6598	263.2182	176.4138	68.3179	19.6420	0.0000	0.0000	0.0000	0.0000	96.8000	257.4254	415.1556 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1690.6326
Space heating per m2										(98c) / (4) =		27.8982 (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	662.9811	521.9213	535.5983	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9667	0.9815	0.9717	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	640.9075	512.2767	520.4486	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	1397.0744	1332.2754	1190.8160	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	544.4402	610.0790	498.7534	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	136.1100	152.5198	124.6883	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												413.3182 (107)
Energy for space heating												27.8982 (99)
Energy for space cooling												6.8204 (108)
Total												34.7187 (109)
Fabric Energy Efficiency (DFEE)												34.7 (109)

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

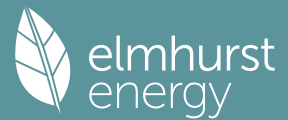
1. Overall dwelling characteristics

Main dwelling	Area (m2)	Storey height (m)	Volume (m3)
Ground floor	60.6000 (1b)	x 2.7500 (2b)	= 166.6500 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	60.6000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 166.6500 (5)

2. Ventilation rate

	m3 per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Air changes per hour	
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) = 0.1200 (8)
Pressure test	Yes
Pressure Test Method	Blower Door

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Measured/design AP50 5.0000 (17)
Infiltration rate 0.3700 (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) = 0.2868 (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	0.3656	0.3584	0.3513	0.3154	0.3083	0.2724	0.2724	0.2653	0.2868	0.3083	0.3226	0.3369 (22b)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)												
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												
Effective ac	0.5668	0.5642	0.5617	0.5497	0.5475	0.5371	0.5371	0.5352	0.5411	0.5475	0.5520	0.5568 (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			2.1000	1.0000	2.1000		(26)
TER Opening Type			13.0600	1.1450	14.9542		(27)
exposed wall	48.4000	13.0600	35.3400	0.1800	6.3612		(29a)
corridor wall	19.8000	2.1000	17.7000	0.1800	3.1860		(29a)
Total net area of external elements Aum(A, m2)				68.2000			(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	26.6014	(33)
Main dwelling							
pw			38.2250	0.0000	0.0000		(32)

Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K 172.2665 (35)

List of Thermal Bridges

K1 Element	Length m	Psi-value W/K	Total
E2 Other lintels (including other steel lintels)	12.9500	0.0500	0.6475
E3 Sill	11.9500	0.0500	0.5975
E4 Jamb	42.7000	0.0500	2.1350
E7 Party floor between dwellings (in blocks of flats)	34.5000	0.0700	2.4150
E23 Balcony within or between dwellings, balcony support penetrates wall insulation	14.9000	0.0200	0.2980
E16 Corner (normal)	11.0000	0.0900	0.9900
E17 Corner (inverted - internal area greater than external area)	8.2500	-0.0900	-0.7425
E18 Party wall between dwellings	11.0000	0.0600	0.6600

Thermal bridges (Sum(L x Psi) calculated using Appendix K) 7.0005 (36)
Point Thermal Bridges 0.0000
Total fabric heat loss (33) + (36) + (36a) = 33.6019 (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	31.1730	31.0303	30.8903	30.2332	30.1103	29.5379	29.5379	29.4319	29.7584	30.1103	30.3590	30.6190 (38)
Heat transfer coeff	64.7749	64.6322	64.4922	63.8351	63.7122	63.1398	63.1398	63.0338	63.3603	63.7122	63.9609	64.2209 (39)
Average = Sum(39)m / 12 =												
												63.8345

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.0689	1.0665	1.0642	1.0534	1.0514	1.0419	1.0419	1.0402	1.0455	1.0514	1.0555	1.0598 (40)
HLP (average)												1.0534
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.9985 (42)
Hot water usage for mixer showers												0.0000 (42a)
Hot water usage for baths												24.9484 (42b)
Hot water usage for other uses												35.0971 (42c)
Average daily hot water use (litres/day)												55.0376 (43)
Daily hot water use	60.0456	58.3988	56.6007	54.3624	52.3658	50.2908	49.8593	51.6537	53.4941	55.6251	57.8832	59.9612 (44)
Energy conte	95.0975	83.1591	86.9932	74.4195	70.4944	61.8384	60.3005	63.9581	65.9636	75.4827	82.4652	93.8848 (45)
Energy content (annual)												Total = Sum(45)m = 914.0569
Distribution loss (46)m = 0.15 x (45)m												
Water storage loss (or HIU loss):												
Total storage loss												
If cylinder contains dedicated solar storage												
Primary loss												
Combi loss												
Total heat required for water heating calculated for each month												
WWHRS												
PV diverter												
Solar input												
FGHRS												
Output from w/h												
12Total per year (kWh/year)												776.9484 (64)
Electric shower(s)												
Heat gains from water heating, kWh/month												31.5083 (65)

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

Metabolic gains (Table 5), Watts

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274	99.9274	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	88.0981	88.0981	88.0981	88.0981	88.0981	88.0981	88.0981	88.0981	88.0981	88.0981	88.0981	88.0981	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	174.4576	176.2679	171.7059	161.9941	149.7346	138.2124	130.5149	128.7045	133.2665	142.9784	155.2379	166.7600	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927	32.9927	(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)	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	-79.9419	(71)
Water heating gains (Table 5)	42.6962	41.6211	39.9612	36.8683	34.8286	32.7349	31.7069	32.9617	34.3726	36.6736	39.6632	42.3498	(72)
Total internal gains	358.2301	368.4044	352.7435	342.8753	325.6395	314.9602	303.2981	302.7426	311.6521	320.7283	338.9140	350.1862	(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	
Northeast				6.6200	11.2829	0.6300	0.7000		0.7700		22.8272 (75)	
East				0.8200	19.6403	0.6300	0.7000		0.7700		4.9219 (76)	
Southeast				5.6200	36.7938	0.6300	0.7000		0.7700		63.1951 (77)	
Solar gains	90.9441	163.7382	246.8562	343.1031	417.5550	428.9648	407.5775	349.9571	279.9281	187.1793	110.5526	76.7712 (83)
Total gains	449.1742	532.1426	599.5997	685.9784	743.1945	743.9250	710.8756	652.6997	591.5802	507.9076	449.4666	426.9574 (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)													
tau	44.7676	44.8665	44.9638	45.4267	45.5144	45.9270	45.9270	46.0042	45.7672	45.5144	45.3374	45.1538	
alpha	3.9845	3.9911	3.9976	4.0284	4.0343	4.0618	4.0618	4.0669	4.0511	4.0343	4.0225	4.0103	
util living area	0.9822	0.9652	0.9319	0.8456	0.7020	0.5214	0.3855	0.4350	0.6667	0.8917	0.9671	0.9852	(86)
MIT	19.4675	19.7386	20.0986	20.5381	20.8299	20.9610	20.9910	20.9854	20.8970	20.4962	19.9094	19.4216	(87)
Th 2	20.0263	20.0283	20.0302	20.0391	20.0408	20.0486	20.0486	20.0500	20.0455	20.0408	20.0374	20.0338	(88)
util rest of house	0.9782	0.9578	0.9175	0.8153	0.6504	0.4514	0.3046	0.3492	0.5954	0.8628	0.9589	0.9819	(89)
MIT 2	18.6405	18.9078	19.2579	19.6745	19.9254	20.0287	20.0456	20.0448	19.9866	19.6485	19.0856	18.6009	(90)
Living area fraction									fLA = Living area / (4) =			0.5660	(91)
MIT	19.1086	19.3780	19.7337	20.1633	20.4374	20.5564	20.5807	20.5772	20.5019	20.1283	19.5519	19.0654	(92)
Temperature adjustment												0.0000	
adjusted MIT	19.1086	19.3780	19.7337	20.1633	20.4374	20.5564	20.5807	20.5772	20.5019	20.1283	19.5519	19.0654	(93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9735	0.9518	0.9125	0.8195	0.6726	0.4894	0.3502	0.3974	0.6308	0.8657	0.9538	0.9777	(94)
Useful gains	437.2839	506.4826	547.1260	562.1601	499.8730	364.0589	248.9449	259.3508	373.1568	439.7209	428.6839	417.4241	(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	959.2258	935.7447	853.4728	718.9948	556.6775	376.0844	251.3382	263.3055	405.6268	607.0673	796.4344	954.6714	(97)
Space heating kWh	388.3248	288.4642	227.9220	112.9210	42.2626	0.0000	0.0000	0.0000	0.0000	124.5057	264.7804	399.7120	(98a)
Space heating requirement - total per year (kWh/year)												1848.8927	
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	388.3248	288.4642	227.9220	112.9210	42.2626	0.0000	0.0000	0.0000	0.0000	124.5057	264.7804	399.7120	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1848.8927	
Space heating per m ²										(98c) / (4) =		30.5098	(99)

8c. Space cooling requirement

Calculated for June, July and August. See Table 10b													
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	593.5142	467.2346	479.0570	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9127	0.9499	0.9308	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	541.6962	443.8377	445.8838	0.0000	0.0000	0.0000	0.0000	(102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	837.0784	800.1843	733.8860	0.0000	0.0000	0.0000	0.0000	(103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	212.6752	265.1218	214.2736	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	53.1688	66.2805	53.5684	0.0000	0.0000	0.0000	0.0000	(107)
Space cooling requirement												173.0177	(107)
Energy for space heating												30.5098	(99)
Energy for space cooling												2.8551	(108)
Total												33.3649	(109)
Fabric Energy Efficiency (TFEE)												33.4	(109)