

Full SAP Calculation Printout



Plot Reference	UNIT 15			Issued on Date	08/07/2026
Assessment Reference	001	Plot Type Ref	UNIT 15		
Plot Address	UNIT 15, Stoney Wood Quarter, 34 The Fairway, LONDON, NW7 3HS			SAP Version	10.2
SAP Rating	79 C	DER	4.68	TER	17.45
Environmental	96 A	% DER < TER			73.18
CO ₂ Emissions (t/year)	0.3	DFEE	49.64	TFEE	50.66
Compliance Check	See BREL	% DFEE < TFEE			2.02
% DPER < TPER	47.24	DPER	49.49	TPER	93.80
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			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	72.7000		210.8300
Dwelling volume			210.8300

2. Ventilation rate

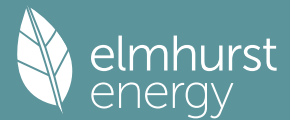
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
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) =	30.0000 / (5) = 0.1423 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.0000 (17)
Infiltration rate	0.2923 (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) = 0.2265 (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	0.2888	0.2832	0.2775	0.2492	0.2435	0.2152	0.2152	0.2095	0.2265	0.2435	0.2548	0.2662 (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	0.5417	0.5401	0.5385	0.5310	0.5297	0.5232	0.5232	0.5220	0.5257	0.5297	0.5325	0.5354 (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			45.3300	0.7940	35.9901		(27)
exposed wall	74.5300	45.3300	29.2000	0.1500	4.3800	60.0000	1751.9999 (29a)
corridor wall	15.9500	2.1000	13.8500	0.2500	3.4625	9.0000	124.6500 (29a)
stair wall	7.2500		7.2500	0.1700	1.2325	9.0000	65.2500 (29a)
flat roof	72.7000		72.7000	0.1000	7.2700	9.0000	654.3000 (30)
Total net area of external elements Aum(A, m ²)			170.4300				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	54.4351		(33)
Main dwelling							
pw			14.5000	0.0000	0.0000	110.0000	1595.0000 (32)
pf			72.7000			40.0000	2907.9999 (32d)
iw			176.9000			9.0000	1592.0999 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	8691.2997 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							119.5502 (35)
List of Thermal Bridges							
K1 Element				Length	Psi-value	Total	
E2 Other lintels (including other steel lintels)				17.3600	0.0500	0.8680	

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E3 Sill									16.3600	0.0500	0.8180	
E4 Jamb									64.0000	0.0500	3.2000	
E7 Party floor between dwellings (in blocks of flats)									27.7000	0.0700	1.9390	
E23 Balcony within or between dwellings, balcony support penetrates wall insulation									5.5000	0.0200	0.1100	
E24 Raves (insulation at ceiling level - inverted)									4.9000	0.0800	0.3920	
E15 Flat roof with parapet									25.8000	0.5600	14.4480	
E16 Corner (normal)									14.5000	0.0900	1.3050	
E17 Corner (inverted - internal area greater than external area)									11.6000	-0.0900	-1.0440	
E18 Party wall between dwellings									11.6000	0.0600	0.6960	
Thermal bridges (Sum(L x Psi) calculated using Appendix K)												22.7320 (36)
Point Thermal Bridges												0.0000
Total fabric heat loss												(33) + (36) + (36a) = 77.1671 (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	37.6888	37.5762	37.4657	36.9469	36.8499	36.3980	36.3980	36.3143	36.5720	36.8499	37.0462	37.2515 (38)
Average = Sum(39)m / 12 =	114.8560	114.7433	114.6328	114.1140	114.0170	113.5651	113.5651	113.4814	113.7392	114.0170	114.2133	114.4186 (39)
												114.1136
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.5799	1.5783	1.5768	1.5697	1.5683	1.5621	1.5621	1.5610	1.5645	1.5683	1.5710	1.5738 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31
												1.5697
												31

4. Water heating energy requirements (kWh/year)												

Assumed occupancy												2.3098 (42)
Hot water usage for mixer showers												0.0000 (42a)
Hot water usage for baths												27.1930 (42b)
Hot water usage for other uses												38.2852 (42c)
Average daily hot water use (litres/day)												60.0169 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	65.4782	63.6822	61.7213	59.2805	57.1031	54.8403	54.3700	56.3269	58.3340	60.6578	63.1202	65.3863 (44)
Energy conte	103.7015	90.6825	94.8633	81.1520	76.8718	67.4325	65.7558	69.7445	71.9317	82.3121	89.9263	102.3791 (45)
Energy content (annual)										Total = Sum(45)m =		996.7529
Distribution loss (46)m = 0.15 x (45)m												0.0000 (46)
Water storage loss (or HIU loss):												
Total storage loss												0.0000 (56)
If cylinder contains dedicated solar storage												
Primary loss												0.0000 (57)
Combi loss												0.0000 (59)
Total heat required for water heating calculated for each month												0.0000 (61)
WWHRS												88.1463 (62)
PV diverter												77.0802 (63a)
Solar input												80.6338 (63b)
FGHRS												68.9792 (63c)
Output from w/h												65.3410 (63d)
	88.1463	77.0802	80.6338	68.9792	65.3410	57.3176	55.8924	59.2828	61.1419	69.9653	76.4373	87.0222 (64)
12Total per year (kWh/year)												847.2400 (64)
Electric shower(s)												847 (64)
Heat gains from water heating, kWh/month												50.4111 (64a)
	50.4111	44.9167	49.0473	46.8052	47.6835	45.4854	47.0016	47.6835	46.8052	49.0473	48.1250	573.4228 (64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												573.4228 (64a)
	34.6393	30.4992	32.4203	28.9461	28.2561	25.7008	25.7235	26.7416	26.9868	29.7531	31.1406	34.3583 (65)

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

Metabolic gains (Table 5), Watts												
(66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925 (66)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	102.6499	113.6481	102.6499	106.0715	102.6499	106.0715	102.6499	102.6499	106.0715	102.6499	106.0715	102.6499 (67)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	203.5149	205.6267	200.3049	188.9755	174.6741	161.2328	152.2532	150.1413	155.4631	166.7926	181.0940	194.5353 (68)
Pumps, fans	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492 (69)
Losses e.g. evaporation (negative values) (Table 5)	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)
Water heating gains (Table 5)	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940 (71)
Total internal gains	46.5582	45.3857	43.5756	40.2029	37.9787	35.6955	34.5746	35.9430	37.4816	39.9908	43.2508	46.1805 (72)
	410.3707	422.3083	404.1782	392.8977	372.9504	360.6476	347.1254	346.3819	356.6640	367.0810	388.0641	401.0134 (73)

6. Solar gains												

[Jan]												
			Area		Solar flux		g		FF		Access	Gains
			m2		Table 6a		Specific data		Specific data		factor	W
					W/m2		or Table 6b		or Table 6c		Table 6d	
Northeast			11.5600		11.2829		0.5300		0.7000		0.7700	33.5341 (75)
East			3.5400		19.6403		0.5300		0.7000		0.7700	17.8755 (76)
Southeast			16.8700		36.7938		0.5300		0.7000		0.7700	159.5869 (77)
Southwest			13.3600		36.7938		0.5300		0.7000		0.7700	126.3830 (79)
Solar gains	337.3795	590.3405	847.0586	1111.7722	1299.3990	1313.0943	1256.4059	1113.3700	938.4989	663.2746	407.0093	286.8162 (83)
Total gains	747.7502	1012.6487	1251.2368	1504.6699	1672.3493	1673.7419	1603.5313	1459.7520	1295.1629	1030.3556	795.0733	687.8297 (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	21.0198	21.0404	21.0607	21.1565	21.1745	21.2587	21.2587	21.2744	21.2262	21.1745	21.1381	21.1001	
alpha	2.4013	2.4027	2.4040	2.4104	2.4116	2.4172	2.4172	2.4183	2.4151	2.4116	2.4092	2.4067	
util living area	0.9338	0.8776	0.7984	0.6758	0.5360	0.3995	0.2986	0.3379	0.5190	0.7547	0.8958	0.9442 (86)	
MIT	18.2984	18.8760	19.5301	20.1919	20.6357	20.8707	20.9534	20.9360	20.7496	20.0932	19.0567	18.1765 (87)	
Th 2	19.6281	19.6293	19.6304	19.6357	19.6366	19.6412	19.6412	19.6421	19.6395	19.6366	19.6347	19.6326 (88)	
util rest of house	0.9222	0.8581	0.7682	0.6313	0.4767	0.3248	0.2112	0.2453	0.4385	0.7069	0.8754	0.9342 (89)	
MIT 2	17.2563	17.8099	18.4248	19.0244	19.3974	19.5769	19.6264	19.6200	19.5014	18.9657	18.0016	17.1410 (90)	
Living area fraction									fLA = Living area / (4) =				0.4003 (91)
MIT	17.6734	18.2366	18.8672	19.4918	19.8931	20.0948	20.1576	20.1468	20.0010	19.4170	18.4239	17.5555 (92)	
Temperature adjustment												0.0000	
adjusted MIT	17.6734	18.2366	18.8672	19.4918	19.8931	20.0948	20.1576	20.1468	20.0010	19.4170	18.4239	17.5555 (93)	

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9003	0.8338	0.7489	0.6262	0.4884	0.3505	0.2452	0.2807	0.4611	0.6981	0.8526	0.9138 (94)
Useful gains	673.1844	844.3237	937.0698	942.1939	816.8238	586.6913	393.1263	409.7003	597.2453	719.3233	677.9094	628.5330 (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	1536.0168	1530.2896	1417.6892	1208.6688	934.1504	624.0146	404.0183	425.1901	671.1802	1005.2898	1293.3428	1528.1153 (97)
Space heating kWh	641.9473	460.9691	357.5808	191.8619	87.2910	0.0000	0.0000	0.0000	0.0000	212.7591	443.1121	669.2893 (98a)
Space heating requirement - total per year (kWh/year)												3064.8106
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	641.9473	460.9691	357.5808	191.8619	87.2910	0.0000	0.0000	0.0000	0.0000	212.7591	443.1121	669.2893 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												3064.8106
Space heating per m2										(98c) / (4) =		42.1570 (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	1067.5122	840.3819	862.4590	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8756	0.9120	0.8909	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	934.6944	766.4501	768.3792	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	1917.4744	1837.4152	1671.3567	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	707.6016	796.7981	671.8152	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	176.9004	199.1995	167.9538	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												544.0537 (107)
Energy for space heating												42.1570 (99)
Energy for space cooling												7.4835 (108)
Total												49.6405 (109)
Fabric Energy Efficiency (DFEE)												49.6 (109)

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

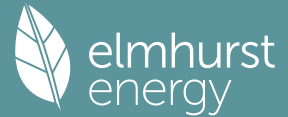
1. Overall dwelling characteristics

Main dwelling	Area (m2)	Storey height (m)	Volume (m3)
Ground floor	72.7000 (1b)	x 2.9000 (2b)	= 210.8300 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	72.7000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	210.8300 (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)

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Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) = 30.0000 / (5) = 0.1423 (8)
Pressure test Yes
Pressure Test Method Blower Door
Measured/design AP50 5.0000 (17)
Infiltration rate 0.3923 (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) = 0.3040 (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	0.3876	0.3800	0.3724	0.3344	0.3268	0.2888	0.2888	0.2812	0.3040	0.3268	0.3420	0.3572 (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	0.5751	0.5722	0.5694	0.5559	0.5534	0.5417	0.5417	0.5395	0.5462	0.5534	0.5585	0.5638 (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			16.0700	1.1450	18.4008		(27)
exposed wall	74.5300	16.0700	58.4600	0.1800	10.5228		(29a)
corridor wall	15.9500	2.1000	13.8500	0.1800	2.4930		(29a)
stair wall	7.2500		7.2500	0.1800	1.3050		(29a)
flat roof	72.7000		72.7000	0.1100	7.9970		(30)
Total net area of external elements Aum(A, m2)			170.4300				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 42.8186		(33)
Main dwelling							
pw			14.5000	0.0000	0.0000		(32)

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

119.5502 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total
E2 Other lintels (including other steel lintels)	17.3600	0.0500	0.8680
E3 Sill	16.3600	0.0500	0.8180
E4 Jamb	64.0000	0.0500	3.2000
E7 Party floor between dwellings (in blocks of flats)	27.7000	0.0700	1.9390
E23 Balcony within or between dwellings, balcony support penetrates wall insulation	5.5000	0.0200	0.1100
E24 Eaves (insulation at ceiling level - inverted)	4.9000	0.2400	1.1760
E15 Flat roof with parapet	25.8000	0.5600	14.4480
E16 Corner (normal)	14.5000	0.0900	1.3050
E17 Corner (inverted - internal area greater than external area)	11.6000	-0.0900	-1.0440
E18 Party wall between dwellings	11.6000	0.0600	0.6960

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

23.5160 (36)

Point Thermal bridges

(36a) = 0.0000

Total fabric heat loss

(33) + (36) + (36a) = 66.3346 (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	40.0141	39.8111	39.6122	38.6777	38.5028	37.6889	37.6889	37.5382	38.0024	38.5028	38.8565	39.2263 (38)
Heat transfer coeff	106.3487	106.1457	105.9467	105.0122	104.8374	104.0235	104.0235	103.8728	104.3370	104.8374	105.1911	105.5609 (39)
Average = Sum(39)m / 12 =												105.0114

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.4628	1.4601	1.4573	1.4445	1.4421	1.4309	1.4309	1.4288	1.4352	1.4421	1.4469	1.4520 (40)
HLP (average)												1.4444
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy 2.3098 (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 27.1930 26.7892 26.2205 25.1719 24.3867 23.5160 23.0458 23.6105 24.2254 25.1570 26.2272 27.1011 (42b)

Hot water usage for other uses 38.2852 36.8930 35.5008 34.1086 32.7164 31.3242 31.3242 32.7164 34.1086 35.5008 36.8930 38.2852 (42c)

Average daily hot water use (litres/day) 60.0169 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	65.4782	63.6822	61.7213	59.2805	57.1031	54.8403	54.3700	56.3269	58.3340	60.6578	63.1202	65.3863 (44)
Energy conte	103.7015	90.6825	94.8633	81.1520	76.8718	67.4325	65.7558	69.7445	71.9317	82.3121	89.9263	102.3791 (45)
Energy content (annual)										Total = Sum(45)m =		996.7529
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	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	88.1463	77.0802	80.6338	68.9792	65.3410	57.3176	55.8924	59.2828	61.1419	69.9653	76.4373	87.0222 (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 (64a)
Output from w/h	88.1463	77.0802	80.6338	68.9792	65.3410	57.3176	55.8924	59.2828	61.1419	69.9653	76.4373	87.0222 (64)
Total per year (kWh/year)										Total per year (kWh/year) = Sum(64)m =		847.2400 (64)
Electric shower(s)	50.4111	44.9167	49.0473	46.8052	47.6835	45.4854	47.0016	47.6835	46.8052	49.0473	48.1250	50.4111 (64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												573.4228 (64a)
Heat gains from water heating, kWh/month												

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34.6393 30.4992 32.4203 28.9461 28.2561 25.7008 25.7235 26.7416 26.9868 29.7531 31.1406 34.3583 (65)

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

Metabolic gains (Table 5), Watts

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925	115.4925	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	102.6708	113.6712	102.6708	106.0931	102.6708	106.0931	102.6708	102.6708	106.0931	102.6708	106.0931	102.6708	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	203.5149	205.6267	200.3049	188.9755	174.6741	161.2328	152.2532	150.1413	155.4631	166.7926	181.0940	194.5353	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492	34.5492	(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)	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	-92.3940	(71)
Water heating gains (Table 5)	46.5582	45.3857	43.5756	40.2029	37.9787	35.6955	34.5746	35.9430	37.4816	39.9908	43.2508	46.1805	(72)
Total internal gains	410.3916	422.3314	404.1991	392.9193	372.9713	360.6692	347.1463	346.4028	356.6856	367.1019	388.0857	401.0343	(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				4.1000	11.2829		0.6300		0.7000		0.7700		14.1377 (75)
East				1.2600	19.6403		0.6300		0.7000		0.7700		7.5629 (76)
Southeast				5.9800	36.7938		0.6300		0.7000		0.7700		67.2431 (77)
Southwest				4.7300	36.7938		0.6300		0.7000		0.7700		53.1873 (79)

Solar gains	142.1311	248.7100	356.8911	468.4580	547.5424	553.3230	529.4313	469.1416	395.4302	279.4445	171.4669	120.8283	(83)
Total gains	552.5227	671.0414	761.0902	861.3773	920.5137	913.9922	876.5776	815.5444	752.1158	646.5463	559.5525	521.8626	(84)

7. Mean internal temperature (heating season)

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

Utilisation factor for gains for living area, nil,m (see Table 9a)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	21.0000 (85)
tau	22.7013	22.7447	22.7874	22.9902	23.0285	23.2087	23.2087	23.2424	23.1390	23.0285	22.9511	22.8707	
alpha	2.5134	2.5163	2.5192	2.5327	2.5352	2.5472	2.5472	2.5495	2.5426	2.5352	2.5301	2.5247	
util living area	0.9628	0.9400	0.9061	0.8389	0.7374	0.5977	0.4692	0.5129	0.7019	0.8715	0.9438	0.9674	(86)
MIT	18.1537	18.5312	19.0599	19.7395	20.3184	20.7241	20.8928	20.8624	20.5571	19.7876	18.8533	18.0887	(87)
Th 2	19.7155	19.7176	19.7197	19.7294	19.7312	19.7398	19.7398	19.7413	19.7365	19.7312	19.7275	19.7237	(88)
util rest of house	0.9560	0.9292	0.8888	0.8080	0.6845	0.5121	0.3531	0.3965	0.6251	0.8400	0.9318	0.9614	(89)
MIT 2	17.1731	17.5440	18.0603	18.7147	19.2436	19.5861	19.7003	19.6865	19.4645	18.7781	17.8731	17.1144	(90)
Living area fraction	17.5656	17.9392	18.4604	19.1249	19.6738	20.0416	20.1776	20.1572	19.9018	19.1821	18.2654	17.5044	(91)
MIT	17.5656	17.9392	18.4604	19.1249	19.6738	20.0416	20.1776	20.1572	19.9018	19.1821	18.2654	17.5044	(92)
Temperature adjustment	17.5656	17.9392	18.4604	19.1249	19.6738	20.0416	20.1776	20.1572	19.9018	19.1821	18.2654	17.5044	(93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9401	0.9096	0.8674	0.7907	0.6818	0.5342	0.3956	0.4374	0.6363	0.8233	0.9135	0.9468	(94)
Useful gains	519.4322	610.3642	660.1492	681.1340	627.6057	488.2477	346.7897	356.7354	478.5736	532.3068	511.1325	494.0792	(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	1410.7777	1384.0533	1267.1666	1073.7410	835.9509	566.0563	372.1588	390.2710	605.3459	899.7291	1174.5041	1404.4220	(97)
Space heating kWh	663.1611	519.9191	451.6209	282.6770	155.0088	0.0000	0.0000	0.0000	0.0000	273.3622	477.6275	677.2950	(98a)
Space heating requirement - total per year (kWh/year)												3500.6718	
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	663.1611	519.9191	451.6209	282.6770	155.0088	0.0000	0.0000	0.0000	0.0000	273.3622	477.6275	677.2950	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												3500.6718	
Space heating per m ²										(98c) / (4) =		48.1523	(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	977.8207	769.7737	789.4329	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.7363	0.8008	0.7702	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	719.9733	616.4364	608.0455	0.0000	0.0000	0.0000	0.0000	(102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	1029.4318	987.7066	918.3650	0.0000	0.0000	0.0000	0.0000	(103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	222.8102	276.2250	230.8777	0.0000	0.0000	0.0000	0.0000	(104)
Cooled fraction									f _c = 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	55.7025	69.0563	57.7194	0.0000	0.0000	0.0000	0.0000	(107)
Space cooling requirement												182.4782	(107)
Energy for space heating												48.1523	(99)
Energy for space cooling												2.5100	(108)

Total
Fabric Energy Efficiency (TFEE)

50.6623 (109)
50.7 (109)