

Full SAP Calculation Printout



Plot Reference	UNIT 06			Issued on Date	08/07/2026
Assessment Reference	001	Plot Type Ref	UNIT 06		
Plot Address	UNIT 06, Stoney Wood Quarter, 34 The Fairway, LONDON, NW7 3HS			SAP Version	10.2
SAP Rating	82 B	DER	3.43	TER	13.67
Environmental	97 A	% DER < TER			74.91
CO ₂ Emissions (t/year)	0.2	DFEE	25.54	TFEE	29.17
Compliance Check	See BREL	% DFEE < TFEE			12.44
% DPER < TPER	49.77	DPER	36.99	TPER	73.64
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	62.2000 (1b)	x 2.8000 (2b)	= 174.1600 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	62.2000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 174.1600 (5)

2. Ventilation rate

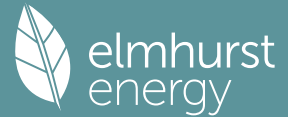
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
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) = 0.1148 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.0000 (17)
Infiltration rate	0.2648 (18)
Number of sides sheltered	4 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.7000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.1854 (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	0.2364	0.2317	0.2271	0.2039	0.1993	0.1761	0.1761	0.1715	0.1854	0.1993	0.2086	0.2178 (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	0.5279	0.5268	0.5258	0.5208	0.5199	0.5155	0.5155	0.5147	0.5172	0.5199	0.5217	0.5237 (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			12.9200	0.7940	10.2579		(27)
exposed floor			8.2000	0.0900	0.7380	75.0000	615.0000 (28b)
exposed wall	40.0400	12.9200	27.1200	0.1500	4.0680	60.0000	1627.2001 (29a)
corridor wall	17.9200	2.1000	15.8200	0.2500	3.9550	9.0000	142.3800 (29a)
corridor above	4.9000		4.9000	0.0900	0.4410	9.0000	44.1000 (30)
Total net area of external elements Aum(A, m ²)			71.0600				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		21.5599		(33)
Main dwelling							
pw			45.6400	0.0000	0.0000	110.0000	5020.3999 (32)
pf			54.0000			40.0000	2160.0000 (32d)
pc			57.3000			30.0000	1719.0000 (32b)
iw			98.5600			9.0000	887.0400 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	12215.1199 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							196.3846 (35)
List of Thermal Bridges							
K1 Element				Length	Psi-value	Total	

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E2 Other lintels (including other steel lintels)									5.7000	0.0500	0.2850	
E3 Sill									4.7000	0.0500	0.2350	
E4 Jamb									26.2000	0.0500	1.3100	
E20 Exposed floor (normal)									4.0000	0.3200	1.2800	
E21 Exposed floor (inverted)									10.4000	0.3200	3.3280	
E7 Party floor between dwellings (in blocks of flats)									10.8000	0.0700	0.7560	
E23 Balcony within or between dwellings, balcony support penetrates wall insulation									1.9000	0.0200	0.0380	
E16 Corner (normal)									11.2000	0.0900	1.0080	
E17 Corner (inverted - internal area greater than external area)									11.2000	-0.0900	-1.0080	
E18 Party wall between dwellings									5.6000	0.0600	0.3360	
Thermal bridges (Sum(L x Psi) calculated using Appendix K)												7.5680 (36)
Point Thermal bridges												0.0000
Total fabric heat loss												(33) + (36) + (36a) = 29.1279 (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	30.3419	30.2795	30.2184	29.9314	29.8777	29.6277	29.6277	29.5814	29.7240	29.8777	29.9863	30.0999 (38)
Average = Sum(39)m / 12 =	59.4698	59.4075	59.3464	59.0593	59.0056	58.7557	58.7557	58.7094	58.8519	59.0056	59.1143	59.2279 (39)
	59.4698	59.4075	59.3464	59.0593	59.0056	58.7557	58.7557	58.7094	58.8519	59.0056	59.1143	59.2279 (39)
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	0.9561	0.9551	0.9541	0.9495	0.9486	0.9446	0.9446	0.9439	0.9462	0.9486	0.9504	0.9522 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31
	31	28	31	30	31	30	31	31	30	31	30	31
4. Water heating energy requirements (kWh/year)												
Assumed occupancy												2.0431 (42)
Hot water usage for mixer showers												0.0000 (42a)
Hot water usage for baths												25.2697 (42b)
Hot water usage for other uses												35.5534 (42c)
Average daily hot water use (litres/day)												34.2606 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	60.8231	59.1550	57.3337	55.0664	53.0439	50.9420	50.5049	52.3226	54.1868	56.3454	58.6328	60.7377 (44)
Energy conte	96.3290	84.2359	88.1197	75.3831	71.4072	62.6391	61.0814	64.7863	66.8178	76.4602	83.5331	95.1006 (45)
Energy content (annual)										Total = Sum(45)m =		925.8934
Distribution loss (46)m = 0.15 x (45)m												0.0000 (46)
Water storage loss (or HIU loss):												0.0000 (46)
Total storage loss												0.0000 (56)
If cylinder contains dedicated solar storage												0.0000 (57)
Primary loss												0.0000 (59)
Combi loss												0.0000 (61)
Total heat required for water heating calculated for each month												81.8796 (62)
WWHRS												0.0000 (63a)
PV diverter												0.0000 (63b)
Solar input												0.0000 (63c)
FGHRS												0.0000 (63d)
Output from w/h												81.8796 (64)
12Total per year (kWh/year)												787.0094 (64)
Electric shower(s)												787 (64)
	46.8293	41.7253	45.5624	43.4797	44.2956	42.2537	43.6621	44.2956	43.4797	45.5624	44.7057	46.8293 (64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												532.6808 (64a)
Heat gains from water heating, kWh/month												32.1772 (65)
	32.1772	28.3315	30.1160	26.8888	26.2479	23.8742	23.8953	24.8410	25.0687	27.6384	28.9272	31.9162 (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	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552 (66)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	90.3324	100.0109	90.3324	93.3435	90.3324	93.3435	90.3324	90.3324	93.3435	90.3324	93.3435	90.3324 (67)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	178.4593	180.3112	175.6446	165.7099	153.1692	141.3827	133.5086	131.6568	136.3234	146.2580	158.7987	170.5852 (68)
Pumps, fans	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155 (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)	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242 (71)
Total internal gains	43.2490	42.1599	40.4786	37.3456	35.2795	33.1586	32.1174	33.3884	34.8176	37.1484	40.1767	42.8981 (72)
	365.6873	376.1286	360.1021	350.0456	332.4277	321.5315	309.6050	309.0242	318.1311	327.3854	345.9655	357.4623 (73)
6. Solar gains												
[Jan]												
			Area	Solar flux	g	Specific data	FF	Access	Gains			
			m2	Table 6a	W/m2	or Table 6b	or Table 6c	factor	W			
								Table 6d				
Southeast			7.5600	36.7938	0.5300	0.7000	0.7700	71.5161 (77)				
Southwest			5.3600	36.7938	0.5300	0.7000	0.7700	50.7045 (79)				
Solar gains	122.2207	208.1870	284.8506	352.9436	395.3263	392.4675	378.3806	346.7612	308.4329	230.0910	146.3922	104.5954 (83)
Total gains	487.9080	584.3156	644.9527	702.9892	727.7540	713.9990	687.9856	655.7854	626.5640	557.4764	492.3577	462.0578 (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	57.0556	57.1155	57.1743	57.4522	57.5045	57.7491	57.7491	57.7947	57.6547	57.5045	57.3988	57.2887
alpha	4.8037	4.8077	4.8116	4.8301	4.8336	4.8499	4.8499	4.8530	4.8436	4.8336	4.8266	4.8192
util living area	0.9830	0.9614	0.9230	0.8352	0.6953	0.5153	0.3737	0.4085	0.6178	0.8658	0.9644	0.9866 (86)
MIT	19.8869	20.1443	20.4249	20.7233	20.9073	20.9823	20.9969	20.9953	20.9587	20.7156	20.2472	19.8303 (87)
Th 2	20.1201	20.1209	20.1217	20.1256	20.1263	20.1297	20.1297	20.1304	20.1284	20.1263	20.1249	20.1233 (88)
util rest of house	0.9790	0.9529	0.9067	0.8033	0.6447	0.4495	0.3008	0.3329	0.5500	0.8320	0.9550	0.9834 (89)
MIT 2	19.1162	19.3677	19.6368	19.9124	20.0655	20.1212	20.1288	20.1288	20.1064	19.9129	19.4743	19.0631 (90)
Living area fraction									fLA = Living area /	(4) =		0.4743 (91)
MIT	19.4817	19.7360	20.0106	20.2970	20.4647	20.5296	20.5405	20.5398	20.5106	20.2936	19.8409	19.4270 (92)
Temperature adjustment												0.0000
adjusted MIT	19.4817	19.7360	20.0106	20.2970	20.4647	20.5296	20.5405	20.5398	20.5106	20.2936	19.8409	19.4270 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9754	0.9486	0.9044	0.8100	0.6650	0.4801	0.3354	0.3687	0.5805	0.8390	0.9514	0.9802 (94)
Useful gains	475.9087	554.2577	583.2856	569.4166	483.9306	342.8186	230.7469	241.8021	363.7158	467.7461	468.4365	452.8945 (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	902.8557	881.3710	801.8057	673.0970	517.1694	348.3984	231.5290	243.0435	377.2779	571.9778	753.1682	901.8607 (97)
Space heating kWh	317.6486	219.8201	162.5789	74.6499	24.7297	0.0000	0.0000	0.0000	0.0000	77.5484	205.0068	334.0309 (98a)
Space heating requirement - total per year (kWh/year)												1416.0134
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	317.6486	219.8201	162.5789	74.6499	24.7297	0.0000	0.0000	0.0000	0.0000	77.5484	205.0068	334.0309 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1416.0134
Space heating per m2										(98c) / (4) =		22.7655 (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	552.3032	434.7919	446.1912	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9423	0.9721	0.9634	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	520.4170	422.6600	429.8688	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	800.9735	772.3511	736.4612	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh												
	0.0000	0.0000	0.0000	0.0000	0.0000	202.0006	260.1702	228.1048	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	50.5002	65.0425	57.0262	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												172.5689 (107)
Energy for space heating												22.7655 (99)
Energy for space cooling												2.7744 (108)
Total												25.5399 (109)
Fabric Energy Efficiency (DFEE)												25.5 (109)

SAP 10 WORKSHEET FOR New Build (As Designed) (Version 10.2, February 2022)

CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY

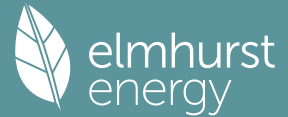
1. Overall dwelling characteristics

	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling	62.2000 (1b)	x 2.8000 (2b)	= 174.1600 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	62.2000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	174.1600 (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	

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Infiltration due to chimneys, flues and fans	= (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =											20.0000 / (5) =	0.1148 (8)
Pressure test													Yes
Pressure Test Method													Blower Door
Measured/design AP50													5.0000 (17)
Infiltration rate													0.3648 (18)
Number of sides sheltered													4 (19)
Shelter factor												(20) = 1 - [0.075 x (19)] =	0.7000 (20)
Infiltration rate adjusted to include shelter factor												(21) = (18) x (20) =	0.2554 (21)
Wind speed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Wind factor	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)
Adj infiltr rate	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)
	0.3256	0.3192	0.3128	0.2809	0.2745	0.2426	0.2426	0.2362	0.2554	0.2745	0.2873	0.3001	(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	0.5530	0.5510	0.5489	0.5395	0.5377	0.5294	0.5294	0.5279	0.5326	0.5377	0.5413	0.5450	(25)

3. Heat losses and heat loss parameter

Element	Gross	Openings	NetArea	U-value	A x U	K-value	A x K	
Main dwelling	m2	m2	m2	W/m2K	W/K	kJ/m2K	kJ/K	
TER Opaque door			2.1000	1.0000	2.1000			(26)
TER Opening Type			12.9200	1.1450	14.7939			(27)
exposed floor			8.2000	0.1300	1.0660			(28b)
exposed wall	40.0400	12.9200	27.1200	0.1800	4.8816			(29a)
corridor wall	17.9200	2.1000	15.8200	0.1800	2.8476			(29a)
corridor above	4.9000		4.9000	0.1100	0.5390			(30)
Total net area of external elements Aum(A, m2)			71.0600					(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	26.2281			(33)
Main dwelling								
pw			45.6400	0.0000	0.0000			(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K								196.3846 (35)
List of Thermal Bridges								
K1 Element				Length	Psi-value		Total	
E2 Other lintels (including other steel lintels)				5.7000	0.0500		0.2850	
E3 Sill				4.7000	0.0500		0.2350	
E4 Jamb				26.2000	0.0500		1.3100	
E20 Exposed floor (normal)				4.0000	0.3200		1.2800	
E21 Exposed floor (inverted)				10.4000	0.3200		3.3280	
E7 Party floor between dwellings (in blocks of flats)				10.8000	0.0700		0.7560	
E23 Balcony within or between dwellings, balcony support penetrates wall insulation				1.9000	0.0200		0.0380	
E16 Corner (normal)				11.2000	0.0900		1.0080	
E17 Corner (inverted - internal area greater than external area)				11.2000	-0.0900		-1.0080	
E18 Party wall between dwellings				5.6000	0.0600		0.3360	
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							7.5680	(36)
Point Thermal bridges						(36a) =	0.0000	
Total fabric heat loss						(33) + (36) + (36a) =	33.7961	(37)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.0431 (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	25.2697	24.8944	24.3659	23.3915	22.6618	21.8528	21.4158	21.9406	22.5120	23.3777	24.3722	25.1843 (42b)
Hot water usage for other uses	35.5534	34.2606	32.9677	31.6749	30.3820	29.0892	29.0892	30.3820	31.6749	32.9677	34.2606	35.5534 (42c)
Average daily hot water use (litres/day)												55.7503 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy content (annual)	60.8231	59.1550	57.3337	55.0664	53.0439	50.9420	50.5049	52.3226	54.1868	56.3454	58.6328	60.7377 (44)
Distribution loss (46)m = 0.15 x (45)m	96.3290	84.2359	88.1197	75.3831	71.4072	62.6391	61.0814	64.7863	66.8178	76.4602	83.5331	95.1006 (45)
Water storage loss (or HIU loss):	Total = Sum(45)m =											925.8934
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 (46)
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 (56)
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	81.8796	71.6005	74.9017	64.0756	60.6962	53.2432	51.9191	55.0683	56.7951	64.9912	71.0032	80.8355 (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	81.8796	71.6005	74.9017	64.0756	60.6962	53.2432	51.9191	55.0683	56.7951	64.9912	71.0032	80.8355 (64)
12Total per year (kWh/year)	Total per year (kWh/year) = Sum(64)m =											787.0094 (64)
Electric shower(s)	46.8293	41.7253	45.5624	43.4797	44.2956	42.2537	43.6621	44.2956	43.4797	45.5624	44.7057	46.8293 (64a)
Heat gains from water heating, kWh/month	Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =											532.6808 (64a)
	32.1772	28.3315	30.1160	26.8888	26.2479	23.8742	23.8953	24.8410	25.0687	27.6384	28.9272	31.9162 (65)

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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	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552	102.1552 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	90.3324	100.0109	90.3324	93.3435	90.3324	93.3435	90.3324	90.3324	93.3435	90.3324	93.3435	90.3324 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	178.4593	180.3112	175.6446	165.7099	153.1692	141.3827	133.5086	131.6568	136.3234	146.2580	158.7987	170.5852 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155	33.2155 (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)	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242	-81.7242 (71)
Water heating gains (Table 5)	43.2490	42.1599	40.4786	37.3456	35.2795	33.1586	32.1174	33.3884	34.8176	37.1484	40.1767	42.8981 (72)
Total internal gains	365.6873	376.1286	360.1021	350.0456	332.4277	321.5315	309.6050	309.0242	318.1311	327.3854	345.9655	357.4623 (73)

6. Solar gains

[Jan]	Area m ²		Solar flux Table 6a W/m ²		Specific data or Table 6b		Specific data or Table 6c		Access factor Table 6d		Gains W	
Southeast	7.5600		36.7938		0.6300		0.7000		0.7700		85.0097 (77)	
Southwest	5.3600		36.7938		0.6300		0.7000		0.7700		60.2715 (79)	
Solar gains	145.2812	247.4676	338.5960	419.5368	469.9162	466.5180	449.7731	412.1879	366.6278	273.5044	174.0134	124.3304 (83)
Total gains	510.9685	623.5962	698.6981	769.5824	802.3439	788.0495	759.3781	721.2121	684.7589	600.8898	519.9789	481.7928 (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	51.7402	51.8337	51.9257	52.3622	52.4447	52.8321	52.8321	52.9045	52.6822	52.4447	52.2781	52.1051
alpha	4.4493	4.4556	4.4617	4.4908	4.4963	4.5221	4.5221	4.5270	4.5121	4.4963	4.4852	4.4737
util living area	0.9818	0.9582	0.9168	0.8254	0.6852	0.5081	0.3694	0.4048	0.6133	0.8611	0.9624	0.9856 (86)
MIT	19.7419	20.0322	20.3488	20.6836	20.8896	20.9773	20.9957	20.9935	20.9480	20.6695	20.1463	19.6853 (87)
Th 2	20.0383	20.0399	20.0414	20.0486	20.0500	20.0563	20.0563	20.0575	20.0539	20.0500	20.0473	20.0444 (88)
util rest of house	0.9774	0.9489	0.8988	0.7911	0.6314	0.4383	0.2915	0.3239	0.5412	0.8251	0.9523	0.9821 (89)
MIT 2	18.9091	19.1930	19.4965	19.8071	19.9785	20.0456	20.0550	20.0554	20.0265	19.8041	19.3138	18.8583 (90)
Living area fraction	19.3041	19.5910	19.9007	20.2228	20.4106	20.4875	20.5011	20.5003	20.4635	20.2145	19.7087	19.2505 (92)
MIT	19.3041	19.5910	19.9007	20.2228	20.4106	20.4875	20.5011	20.5003	20.4635	20.2145	19.7087	19.2505 (93)
Temperature adjustment												0.0000
adjusted MIT	19.3041	19.5910	19.9007	20.2228	20.4106	20.4875	20.5011	20.5003	20.4635	20.2145	19.7087	19.2505 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9732	0.9437	0.8958	0.7978	0.6525	0.4706	0.3285	0.3622	0.5733	0.8319	0.9480	0.9783 (94)
Useful gains	497.2768	588.4725	625.9249	614.0037	523.5648	370.8867	249.4294	261.2345	392.5999	499.8930	492.9334	471.3606 (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	983.9579	961.6857	875.6693	733.7226	563.5609	378.1168	250.5468	262.9768	409.8551	622.0452	818.3592	980.0912 (97)
Space heating kWh	362.0907	250.7992	185.8099	86.1976	29.7571	0.0000	0.0000	0.0000	0.0000	90.8812	234.3066	378.4955 (98a)
Space heating requirement - total per year (kWh/year)												1618.3378
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	362.0907	250.7992	185.8099	86.1976	29.7571	0.0000	0.0000	0.0000	0.0000	90.8812	234.3066	378.4955 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1618.3378
Space heating per m ²										(98c) / (4) =		26.0183 (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	603.7056	475.2576	487.4347	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9364	0.9676	0.9580	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	565.3398	459.8752	466.9564	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	887.5260	855.7970	812.9339	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh												
	0.0000	0.0000	0.0000	0.0000	0.0000	231.9741	294.5658	257.4073	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	57.9935	73.6415	64.3518	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												195.9868 (107)
Energy for space heating												26.0183 (99)
Energy for space cooling												3.1509 (108)
Total												29.1692 (109)
Fabric Energy Efficiency (TFEE)												29.2 (109)

