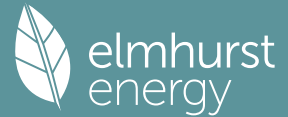


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Property Reference	UNIT 39				Issued on Date	02/07/2025	
Assessment Reference	UNIT 39			Prop Type Ref			
Property	Flat 40, Alexander House, 205 Kings Road, READING, RG1 4FW						
SAP Rating	86 B	DER	4.63	TER	13.02		
Environmental	97 A	% DER < TER				64.44	
CO ₂ Emissions (t/year)	0.17	DFEE	35.81	TFEE	38.75		
Compliance Check	See BREL	% DFEE < TFEE				7.59	
% DPER < TPER	29.67	DPER	48.89	TPER	69.51		
Assessor Details	Mr. Ondrej Gajdos				Assessor ID	W452-0001	
Client							

SAP 10 WORKSHEET FOR New Build (As Built) (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	39.3000 (1b)	2.5000 (2b)	98.2500 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.3000		98.2500 (4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	98.2500 (5)

2. Ventilation rate

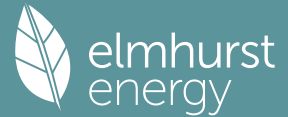
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
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) = 0.2036 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.9200 (17)
Infiltration rate	0.3996 (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) = 0.3097 (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	0.3948	0.3871	0.3793	0.3406	0.3329	0.2942	0.2942	0.2864	0.3097	0.3329	0.3484	0.3639 (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	0.5779	0.5749	0.5719	0.5580	0.5554	0.5433	0.5433	0.5410	0.5479	0.5554	0.5607	0.5662 (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							
1			3.3800	1.1450	3.8702		(27)
2			3.3800	1.1450	3.8702		(27)
1			2.1000	1.0000	2.1000		(26)
top floor exposed new	20.2500	6.7600	13.4900	0.2000	2.6980	18.0000	242.8200 (29a)
corridor new	14.5000	2.1000	12.4000	0.2300	2.8520	14.0000	173.6000 (29a)
flat roof new	16.9000		16.9000	0.1300	2.1970	9.0000	152.1000 (30)
roof terrace new	22.4000		22.4000	0.1300	2.9120	9.0000	201.6000 (30)
Total net area of external elements Aum(A, m ²)			74.0500				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 20.4995		(33)
Main dwelling							
pw			27.2500	0.0000	0.0000	20.0000	545.0000 (32)
pf			39.3000			30.0000	1179.0000 (32d)
iw			56.5000			9.0000	508.5000 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	3002.6200 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							76.4025 (35)
List of Thermal Bridges							
K1 Element					Length	Psi-value	Total

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E2 Other lintels (including other steel lintels)	3.7000	0.0470	0.1739	
E3 Sill	2.7000	0.0150	0.0405	
E4 Jamb	14.2000	0.0470	0.6674	
E15 Flat roof with parapet	8.0000	0.1970	1.5760	
E16 Corner (normal)	2.5000	0.1800	0.4500	
E18 Party wall between dwellings	5.0000	0.2400	1.2000	
E24 Eaves (insulation at ceiling level - inverted)	8.0000	0.0500	0.4000	
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			4.5078	(36)
Point Thermal bridges			0.0000	
Total fabric heat loss			(33) + (36) + (36a) =	25.0073 (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	18.7383	18.6401	18.5440	18.0922	18.0077	17.6142	17.6142	17.5413	17.7657	18.0077	18.1787	18.3574
Average = Sum(39)m / 12 =	43.7455	43.6474	43.5512	43.0994	43.0149	42.6214	42.6214	42.5486	42.7730	43.0149	43.1859	43.3647
												43.0990
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.1131	1.1106	1.1082	1.0967	1.0945	1.0845	1.0845	1.0827	1.0884	1.0945	1.0989	1.1034
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy													1.3879	(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	0.0000	(42a)
Hot water usage for baths	20.5451	20.2400	19.8103	19.0181	18.4249	17.7671	17.4118	17.8384	18.3030	19.0069	19.8154	20.4757	20.4757	(42b)
Hot water usage for other uses	28.8430	27.7942	26.7454	25.6965	24.6477	23.5989	23.5989	24.6477	25.6965	26.7454	27.7942	28.8430	28.8430	(42c)
Average daily hot water use (litres/day)													45.2695	(43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Energy conte	49.3882	48.0342	46.5557	44.7146	43.0726	41.3659	41.0106	42.4861	43.9995	45.7522	47.6096	49.3187	49.3187	(44)
Energy content (annual)	78.2188	68.4001	71.5544	61.2121	57.9839	50.8642	49.5988	52.6067	54.2558	62.0854	67.8287	77.2212	77.2212	(45)
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	0.0000	(46)
Water storage 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	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	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	0.0000	(59)
Total heat required for water heating calculated for each month														
WWHRS	66.4860	58.1401	60.8212	52.0303	49.2864	43.2346	42.1590	44.7157	46.1175	52.7726	57.6544	65.6380	65.6380	(62)
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	0.0000	(63a)
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	0.0000	(63b)
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	0.0000	(63c)
Output from w/h	66.4860	58.1401	60.8212	52.0303	49.2864	43.2346	42.1590	44.7157	46.1175	52.7726	57.6544	65.6380	65.6380	(64)
12Total per year (kWh/year)													639.0556	(64)
Electric shower(s)	38.0309	33.8859	37.0021	35.3106	35.9732	34.3150	35.4588	35.9732	35.3106	37.0021	36.3063	38.0309	38.0309	(64a)
Heat gains from water heating, kWh/month	26.1292	23.0065	24.4558	21.8352	21.3149	19.3874	19.4044	20.1722	20.3570	22.4437	23.4902	25.9172	25.9172	(65)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =													432.5997	(64a)

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	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	(66)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	60.9545	67.4853	60.9545	62.9863	60.9545	62.9863	60.9545	60.9545	62.9863	60.9545	62.9863	60.9545	60.9545	(67)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	119.7770	121.0199	117.8878	111.2200	102.8030	94.8922	89.6074	88.3644	91.4965	98.1644	106.5814	114.4921	114.4921	(68)
Pumps, fans	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	(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	0.0000	(70)
Water heating gains (Table 5)	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	(71)
Total internal gains	35.1199	34.2359	32.8707	30.3267	28.6491	26.9269	26.0812	27.1132	28.2736	30.1662	32.6252	34.8350	34.8350	(72)
	259.6693	266.5589	255.5309	248.3508	236.2244	228.6233	220.4609	220.2500	226.5743	233.1029	246.0107	254.0995	254.0995	(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	
West		3.3800	19.6403	0.6300	0.8000	0.7700	23.1861
West		3.3800	19.6403	0.6300	0.8000	0.7700	23.1861
Solar gains	46.3722	90.7139	149.3928	217.8805	267.0208	273.3433	260.2340
Total gains	306.0415	357.2728	404.9237	466.2314	503.2452	501.9666	480.6949
							223.5371
							173.7500
							107.6397
							57.8207
							38.1342
							292.2337

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	19.0662	19.1091	19.1513	19.3520	19.3900	19.5691	19.5691	19.6026	19.4997	19.3900	19.3133	19.2337
alpha	2.2711	2.2739	2.2768	2.2901	2.2927	2.3046	2.3046	2.3068	2.3000	2.2927	2.2876	2.2822
util living area	0.9145	0.8815	0.8299	0.7340	0.6133	0.4732	0.3617	0.4011	0.5858	0.7843	0.8836	0.9216 (86)
MIT	18.2334	18.6170	19.1827	19.8920	20.4346	20.7811	20.9150	20.8897	20.6239	19.8859	18.9511	18.1699 (87)
Th 2	19.9901	19.9922	19.9942	20.0035	20.0053	20.0135	20.0135	20.0150	20.0103	20.0053	20.0017	19.9980 (88)
util rest of house	0.9047	0.8684	0.8111	0.7051	0.5711	0.4148	0.2890	0.3263	0.5279	0.7535	0.8685	0.9126 (89)
MIT 2	17.4764	17.8508	18.3994	19.0776	19.5732	19.8737	19.9726	19.9591	19.7532	19.0910	18.1908	17.4195 (90)
Living area fraction	fLA = Living area / (4) =											0.5802 (91)
MIT	17.9156	18.2953	18.8538	19.5501	20.0730	20.4001	20.5194	20.4990	20.2584	19.5522	18.6318	17.8549 (92)
Temperature adjustment	0.0000											
adjusted MIT	17.9156	18.2953	18.8538	19.5501	20.0730	20.4001	20.5194	20.4990	20.2584	19.5522	18.6318	17.8549 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8792	0.8415	0.7862	0.6906	0.5741	0.4384	0.3270	0.3640	0.5432	0.7376	0.8432	0.8879 (94)
Useful gains	269.0583	300.6458	318.3669	321.9850	288.9267	220.0727	157.2096	161.5447	217.4645	251.3455	256.1930	259.4719 (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	595.6208	584.6711	538.0237	459.0124	360.1618	247.2094	167.0487	174.4076	263.4114	385.0768	498.0134	592.1385 (97)
Space heating kWh	242.9625	190.8650	163.4247	98.6597	52.9989	0.0000	0.0000	0.0000	0.0000	99.4961	174.1106	247.5040 (98a)
Space heating requirement - total per year (kWh/year)												1270.0215
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	242.9625	190.8650	163.4247	98.6597	52.9989	0.0000	0.0000	0.0000	0.0000	99.4961	174.1106	247.5040 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1270.0215
Space heating per m2												(98c) / (4) = 32.3161 (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	400.6415	315.3986	323.3691	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8064	0.8560	0.8308	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	323.0708	269.9694	268.6498	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	565.8547	542.2281	500.2404	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh												
	0.0000	0.0000	0.0000	0.0000	0.0000	174.8044	202.5604	172.3034	0.0000	0.0000	0.0000	0.0000 (104)
Cooled fraction	fc = cooled area / (4) =											
Intermittency factor (Table 10b)												1.0000 (105)
	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	43.7011	50.6401	43.0759	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												137.4171 (107)
Energy for space heating												32.3161 (99)
Energy for space cooling												3.4966 (108)
Total												35.8127 (109)
Fabric Energy Efficiency (DFEE)												35.8 (109)

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

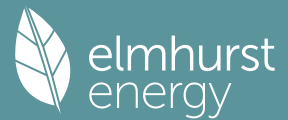
1. Overall dwelling characteristics

	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling	39.3000 (1b)	x 2.5000 (2b)	= 98.2500 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.3000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 98.2500 (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)+(7a)+(7b)+(7c) =	20.0000 / (5) = 0.2036 (8)
Pressure test	Yes
Pressure Test Method	Blower Door

Full SAP Calculation Printout



Measured/design AP50 5.0000 (17)
Infiltration rate 0.4536 (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) = 0.3515 (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	0.4482	0.4394	0.4306	0.3867	0.3779	0.3339	0.3339	0.3251	0.3515	0.3779	0.3954	0.4130 (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	0.6004	0.5965	0.5927	0.5748	0.5714	0.5558	0.5558	0.5529	0.5618	0.5714	0.5782	0.5853 (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			6.7600	1.1450	7.7405		(27)
top floor exposed new	20.2500	6.7600	13.4900	0.1800	2.4282		(29a)
corridor new	14.5000	2.1000	12.4000	0.1800	2.2320		(29a)
flat roof new	16.9000		16.9000	0.1100	1.8590		(30)
roof terrace new	22.4000		22.4000	0.1100	2.4640		(30)
Total net area of external elements Aum (A, m2)			74.0500				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	18.8237	(33)
Main dwelling							
pw			27.2500	0.0000	0.0000		(32)

Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K 76.4025 (35)

List of Thermal Bridges

	Length	Psi-value	Total
K1 Element	3.7000	0.0500	0.1850
E2 Other lintels (including other steel lintels)	2.7000	0.0500	0.1350
E3 Sill	14.2000	0.0500	0.7100
E4 Jamb	8.0000	0.5600	4.4800
E15 Flat roof with parapet	2.5000	0.0900	0.2250
E16 Corner (normal)	5.0000	0.0600	0.3000
E18 Party wall between dwellings	8.0000	0.2400	1.9200
E24 Eaves (insulation at ceiling level - inverted)			
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			7.9550 (36)
Point Thermal bridges			(36a) = 0.0000
Total fabric heat loss			(33) + (36) + (36a) = 26.7787 (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	19.4675	19.3410	19.2171	18.6350	18.5260	18.0190	18.0190	17.9251	18.2143	18.5260	18.7464	18.9767 (38)
Heat transfer coeff	46.2461	46.1197	45.9957	45.4136	45.3047	44.7977	44.7977	44.7038	44.9930	45.3047	45.5250	45.7554 (39)
Average = Sum(39)m / 12 =												45.4131

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.1767	1.1735	1.1704	1.1556	1.1528	1.1399	1.1399	1.1375	1.1449	1.1528	1.1584	1.1643 (40)
HLP (average)												1.1555
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy													1.3879 (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	0.0000 (42a)	
Hot water usage for baths													
20.5451	20.2400	19.8103	19.0181	18.4249	17.7671	17.4118	17.8384	18.3030	19.0069	19.8154	20.4757	(42b)	
Hot water usage for other uses													
28.8430	27.7942	26.7454	25.6965	24.6477	23.5989	23.5989	24.6477	25.6965	26.7454	27.7942	28.8430	(42c)	
Average daily hot water use (litres/day)													45.2695 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	49.3882	48.0342	46.5557	44.7146	43.0726	41.3659	41.0106	42.4861	43.9995	45.7522	47.6096	49.3187 (44)	
Energy conte	78.2188	68.4001	71.5544	61.2121	57.9839	50.8642	49.5988	52.6067	54.2558	62.0854	67.8287	77.2212 (45)	
Energy content (annual)										Total = Sum(45)m =			751.8301
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	0.0000 (46)	
Water storage 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	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													
66.4860	58.1401	60.8212	52.0303	49.2864	43.2346	42.1590	44.7157	46.1175	52.7726	57.6544	65.6380	(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	66.4860	58.1401	60.8212	52.0303	49.2864	43.2346	42.1590	44.7157	46.1175	52.7726	57.6544	65.6380 (64)	
12Total per year (kWh/year)										Total per year (kWh/year) = Sum(64)m =			639.0556 (64)
Electric shower(s)	38.0309	33.8859	37.0021	35.3106	35.9732	34.3150	35.4588	35.9732	35.3106	37.0021	36.3063	38.0309 (64a)	
Total Energy used by instantaneous electric shower (s) (kWh/year) = Sum(64a)m =													432.5997 (64a)
Heat gains from water heating, kWh/month													
26.1292	23.0065	24.4558	21.8352	21.3149	19.3874	19.4044	20.1722	20.3570	22.4437	23.4902	25.9172	(65)	

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

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Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	69.3929	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	62.1779	68.8398	62.1779	64.2505	62.1779	64.2505	62.1779	62.1779	64.2505	62.1779	64.2505	62.1779	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	119.7770	121.0199	117.8878	111.2200	102.8030	94.8922	89.6074	88.3644	91.4965	98.1644	106.5814	114.4921	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	29.9393	(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)	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	-55.5143	(71)
Water heating gains (Table 5)	35.1199	34.2359	32.8707	30.3267	28.6491	26.9269	26.0812	27.1132	28.2736	30.1662	32.6252	34.8350	(72)
Total internal gains	260.8927	267.9135	256.7543	249.6150	237.4478	229.8875	221.6844	221.4734	227.8385	234.3264	247.2750	255.3229	(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	
West	6.7600				19.6403		0.6300		0.7000		0.7700		40.5757 (80)	
Solar gains	40.5757	79.3746	130.7187	190.6455	233.6432	239.1754	227.7047	195.5950	152.0313	94.1847	50.5931	33.3675	(83)	
Total gains	301.4684	347.2881	387.4731	440.2605	471.0910	469.0629	449.3891	417.0684	379.8698	328.5111	297.8681	288.6904	(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	18.0353	18.0847	18.1334	18.3659	18.4100	18.6184	18.6184	18.6575	18.5376	18.4100	18.3209	18.2287	
alpha	2.2024	2.2056	2.2089	2.2244	2.2273	2.2412	2.2412	2.2438	2.2358	2.2273	2.2214	2.2152	
util living area	0.9192	0.8909	0.8469	0.7622	0.6508	0.5123	0.3969	0.4362	0.6189	0.8028	0.8911	0.9255	(86)
MIT	18.0375	18.4053	18.9681	19.7092	20.3070	20.7183	20.8862	20.8558	20.5434	19.7470	18.7860	17.9846	(87)
Th 2	19.9386	19.9412	19.9438	19.9557	19.9580	19.9684	19.9684	19.9703	19.9644	19.9580	19.9534	19.9487	(88)
util rest of house	0.9096	0.8782	0.8288	0.7338	0.6077	0.4496	0.3159	0.3540	0.5590	0.7726	0.8764	0.9166	(89)
MIT 2	17.2524	17.6127	18.1612	18.8757	19.4273	19.7885	19.9141	19.8977	19.6522	18.9302	18.0001	17.2071	(90)
Living area fraction	17.7079	18.0725	18.6293	19.3593	19.9377	20.3280	20.4780	20.4536	20.1692	19.4041	18.4561	17.6581	(91)
MIT	17.7079	18.0725	18.6293	19.3593	19.9377	20.3280	20.4780	20.4536	20.1692	19.4041	18.4561	17.6581	(92)
Temperature adjustment												0.0000	
adjusted MIT	17.7079	18.0725	18.6293	19.3593	19.9377	20.3280	20.4780	20.4536	20.1692	19.4041	18.4561	17.6581	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Useful gains	0.8835	0.8503	0.8020	0.7156	0.6068	0.4724	0.3570	0.3939	0.5717	0.7540	0.8501	0.8913	(94)
Ext temp.	266.3356	295.2993	310.7444	315.0603	285.8575	221.5694	160.4541	164.2901	217.1548	247.7028	253.2153	257.3102	(95)
Heat loss rate W	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)
Space heating kWh	620.0622	607.5136	557.8960	474.9924	373.2053	256.5997	173.7270	181.2096	273.0721	398.8662	516.9851	615.7821	(97)
Space heating requirement - total per year (kWh/year)	263.1725	209.8080	183.8808	115.1511	64.9867	0.0000	0.0000	0.0000	0.0000	112.4655	189.9143	266.7031	(98a)
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)	263.1725	209.8080	183.8808	115.1511	64.9867	0.0000	0.0000	0.0000	0.0000	112.4655	189.9143	266.7031	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1406.0821	(98c)
Space heating per m2												35.7782	(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	421.0981	331.5028	339.7487	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.7642	0.8200	0.7931	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	321.8043	271.8277	269.4587	0.0000	0.0000	0.0000	0.0000	(102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	526.0252	504.3225	467.7311	0.0000	0.0000	0.0000	0.0000	(103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	147.0391	172.9762	147.5147	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	36.7598	43.2440	36.8787	0.0000	0.0000	0.0000	0.0000	(107)
Space cooling requirement												116.8825	(107)
Energy for space heating												35.7782	(99)
Energy for space cooling												2.9741	(108)
Total												38.7523	(109)
Fabric Energy Efficiency (TFEE)												38.8	(109)