

Summary for Input Data



Plot Reference	A 114	Issued on Date	15/05/2026
Assessment Reference	Be Green 250516	Plot Type Ref	
Plot Address		SAP Version	10.2

SAP Rating	82 B	DER	5.20	TER	15.08
Environmental	96 A	% DER < TER			65.52
CO ₂ Emissions (t/year)	0.34	DFEE	37.95	TFEE	41.95
Compliance Check	See BREL	% DFEE < TFEE			9.55
% DPER < TPER	32.27	DPER	54.72	TPER	80.79

Assessor Details	Mr. Robert Tanner	Assessor ID	W344-0001
Client			

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	Northeast	
Property Tenture	1	
Transaction Type	6	
Terrain Type	Suburban	
1.0 Property Type	Flat, Mid-Terrace	
Position of Flat	Mid-floor flat	
Which Floor	1	
2.0 Number of Storeys	1	
3.0 Date Built	2026	
4.0 Sheltered Sides	3	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	239.96	kJ/m²K
7.0 Electricity Tariff	Standard	
Smart electricity meter fitted	Yes	
Smart gas meter fitted	Yes	

7.0 Measurements		Heat Loss Perimeter	Internal Floor Area	Average Storey Height
	Ground floor:	30.81 m	74.33 m ²	2.80 m

8.0 Living Area	34.26	m ²
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Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Res	Shelter	Openings	Area Calculation Type
External Wall 1	Cavity Wall	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.15	70.00	25.44	11.87	0.00	None	13.57	Enter Gross Area
Corridor wall	Cavity Wall	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.22	70.00	60.83	58.41	0.70	Stairwell Access Corridor 3	2.42	Enter Gross Area

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)	Shelter Res	Shelter
Party Wall 1	Filled Cavity with Edge Sealing	Single plasterboard on dabs on both sides, dense blocks, cavity or cavity fill	0.00	70.00	13.61	0.00	None

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall 1	Plasterboard on timber frame	9.00	173.12

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Ceiling 1	Precast concrete planks floor, screed, carpeted	30.00	74.33

Description	Type	Storey Index	Construction	U-Value (W/m ² K)	Shelter Code	Shelter Factor	Kappa (kJ/m ² K)	Area (m ²)
Heatloss Floor 1	Exposed Floor - Solid	Lowest occupied	Other	0.10	None	0.00	110.00	74.33

Summary for Input Data

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Door	Manufacturer	Door to Corridor				0.00			1.00
Windows	Manufacturer	Window	Double Low-E Soft 0.1			0.35		0.70	1.20

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Door	Door	Corridor wall	North East	2.42	
Windows	Windows	External Wall 1	South West	13.57	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E1 Steel lintel with perforated steel base plate	Independently assessed	6.67	0.05	0.05	No
E4 Jamb	Independently assessed	19.20	0.04	0.04	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	5.73	0.05	0.05	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	21.73	0.04	0.04	No
E9 Balcony between dwellings, wall insulation continuous	Independently assessed	3.36	0.05	0.05	No
E16 Corner (normal)	Independently assessed	5.60	0.05	0.05	No
E16 Corner (normal)	Independently assessed	2.80	0.04	0.04	No
E17 Corner (inverted – internal area greater than external area)	Table K1 - Default	2.80	0.00	0.00	No
E18 Party wall between dwellings	Independently assessed	2.80	0.04	0.04	No
E20 Exposed floor (normal)	Independently assessed	9.09	0.10	0.10	No
E21 Exposed floor (inverted)	Independently assessed	21.73	0.10	0.10	No
E25 Staggered party wall between dwellings	Independently assessed	2.80	0.04	0.04	No
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	Table K1 - Default	4.86	0.00	0.00	No
P7 Party Wall - Exposed floor (normal)	Independently assessed	4.86	0.08	0.08	No
Y-value	0.04			W/m²K	

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500625
Configuration	2
Manufacturer SFP	0.61
Duct Type	Rigid
MVHR Efficiency	89.00
Wet Rooms	2
SFP from Installer Commissioning Certificate	No
MVHR System Location	Inside heated envelope (installed exclusively)
Duct Installation Specification	Level 1

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys	0
Number of open flues	0
Number of chimneys/flues attached to closed fire	0
Number of flues attached to solid fuel boiler	0
Number of flues attached to other heater	0
Number of blocked chimneys	0
Number of intermittent extract fans	0
Number of passive vents	0
Number of flueless gas fires	0

Summary for Input Data

21.0 Fixed Cooling System		No	
22.0 Pressure Testing		Yes	
Designed AP ₅₀	3.00	m ² /(h.m ²) @ 50 Pa	
Test Method	Blower Door		
22.0 Lighting		No	
No Fixed Lighting	No		
	Name	Efficacy	Power
	Lighting 1	75.00	15.00
			Capacity
			1125.00
			Count
			7
24.0 Main Heating 1		None	
25.0 Main Heating 2		None	
26.0 Heat Networks		Space and Water Combined	
Space Community Heating			
Distribution Loss	Calculated		
Distribution Loss Value	1.50		
SAP Code	2306		
	Heat Source	Fuel Type	Heating Use
			Efficiency
			Percentage Of Heat
			Heat
			Heat Power Ratio
			Electrical
			Fuel Factor
			Efficiency type
Heat source 1	Heat pump	Electricity	Space and Water
Heat source 2	None		
Heat source 3	None		
Heat source 4	None		
Heat source 5	None		
27.0 Secondary Heating		None	
28.0 Water Heating			
Water Heating	Community Heating		
SAP Code	901		
Flue Gas Heat Recovery System	No		
Waste Water Heat Recovery Instantaneous System 1	No		
Waste Water Heat Recovery Instantaneous System 2	No		
Waste Water Heat Recovery Storage System	No		
Solar Panel	No		
Water use <= 125 litres/person/day	Yes		
Cold Water Source	From header tank		
Bath Count	1		
28.1 Showers			
Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]
Shower 1	Combi boiler or unvented hot water system	8.00	
Shower 2	Combi boiler or unvented hot water system	8.00	
			Connected
			No
			Connected To
			No
28.3 Waste Water Heat Recovery System			
29.0 Hot Water Cylinder		Internal Store	
Insulation Type	Measured Loss		
Cylinder Volume	180.00		
Loss	1.20		
			L
			kWh/day
32.0 Photovoltaic Unit			
Multiple Dwellings – Not Connected			
Export Capable Meter?	No		
Connected To Dwelling	Yes		
Diverter	No		
Battery Capacity [kWh]	0.00		
PV Cells kWp	Orientation	Elevation	Overshading FGHRs
			MCS Certificate
			Overshading Factor
			MCS Certificate
			Panel Manufacturer

Summary for Input Data



0.36		North East	Horizontal	Modest	No		0.80		Reference		
34.0 Small-scale Hydro				None							
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

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Environmental	96 A	% DER < TER				65.52	
CO ₂ Emissions (t/year)	0.34	DFEE	37.95	TFEE	41.95		
Compliance Check	See BREL	% DFEE < TFEE				9.55	
% DPER < TPER	32.27	DPER	54.72	TPER	80.79		
Assessor Details	Mr. Robert Tanner				Assessor ID	W344-0001	
Client							

SAP 10 WORKSHEET FOR New Build (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	74.3300 (1b)	2.8000 (2b)	208.1240 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	74.3300		208.1240 (4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	208.1240 (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	0 * 10 = 0.0000 (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) =	0.0000 / (5) = 0.0000 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.0000 (17)
Infiltration rate	0.1500 (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) = 0.1162 (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	0.1482	0.1453	0.1424	0.1279	0.1250	0.1104	0.1104	0.1075	0.1162	0.1250	0.1308	0.1366 (22b)
Balanced mechanical ventilation with heat recovery												
If mechanical ventilation												0.5000 (23a)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)												0.5000 (23b)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												80.1000 (23c)
Effective ac	0.2477	0.2448	0.2419	0.2274	0.2245	0.2099	0.2099	0.2070	0.2157	0.2245	0.2303	0.2361 (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							
Door			2.4200	1.0000	2.4200		(26)
Windows			13.5700	1.1450	15.5382		(27)
Heatloss Floor 1			74.3300	0.1000	7.4330	110.0000	8176.3000 (28b)
External Wall 1	25.4400	13.5700	11.8700	0.1500	1.7805	70.0000	830.9000 (29a)
Corridor wall	60.8300	2.4200	58.4100	0.1900	11.0979	70.0000	4088.7000 (29a)
Total net area of external elements Aum(A, m ²)			160.6000				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	38.2696		(33)
Main dwelling							
Party Wall 1			13.6100	0.0000	0.0000	70.0000	952.7000 (32)
Party Ceiling 1			74.3300			30.0000	2229.9000 (32b)
Internal Wall 1			173.1200			9.0000	1558.0800 (32c)
Heat capacity Cm = Sum(A x k)					(28)...(30) + (32) + (32a)...(32e) =		17836.5800 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							239.9647 (35)
List of Thermal Bridges							

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K1 Element	Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate	6.6700	0.0500	0.3335
E4 Jamb	19.2000	0.0400	0.7680
E7 Party floor between dwellings (in blocks of flats)	5.7300	0.0500	0.2865
E7 Party floor between dwellings (in blocks of flats)	21.7300	0.0390	0.8475
E9 Balcony between dwellings, wall insulation continuous	3.3600	0.0500	0.1680
E16 Corner (normal)	5.6000	0.0500	0.2800
E16 Corner (normal)	2.8000	0.0390	0.1092
E17 Corner (inverted - internal area greater than external area)	2.8000	0.0000	0.0000
E18 Party wall between dwellings	2.8000	0.0390	0.1092
E20 Exposed floor (normal)	9.0900	0.1000	0.9090
E21 Exposed floor (inverted)	21.7300	0.1000	2.1730
E25 Staggered party wall between dwellings	2.8000	0.0390	0.1092
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	4.8600	0.0000	0.0000
P7 Party Wall - Exposed floor (normal)	4.8600	0.0800	0.3888
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			6.4819 (36)
Point Thermal bridges			0.0000
Total fabric heat loss		(33) + (36) + (36a) =	44.7514 (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	17.0136	16.8139	16.6143	15.6163	15.4167	14.4187	14.4187	14.2191	14.8179	15.4167	15.8159	16.2151	(38)
Heat transfer coeff	61.7650	61.5654	61.3658	60.3678	60.1682	59.1701	59.1701	58.9705	59.5693	60.1682	60.5674	60.9666	(39)
Average = Sum(39)m / 12 =												60.3179	
HLP	0.8310	0.8283	0.8256	0.8122	0.8095	0.7960	0.7960	0.7934	0.8014	0.8095	0.8148	0.8202	(40)
HLP (average)												0.8115	
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													2.3465 (42)
Hot water usage for mixer showers	61.9569	61.0083	59.6104	57.4599	55.5332	52.8377	50.7057	53.1981	54.4517	57.1215	59.9018	61.9010	(42a)
Hot water usage for baths	26.8452	26.4400	25.8635	25.0001	24.2220	23.1509	22.3383	23.3320	23.8535	24.9148	26.0182	26.8239	(42b)
Hot water usage for other uses	38.6605	37.2547	35.8488	34.4430	33.0372	31.6313	31.6313	33.0372	34.4430	35.8488	37.2547	38.6605	(42c)
Average daily hot water use (litres/day)													117.1572 (43)
Daily hot water use	127.4626	124.7030	121.3227	116.9031	112.7924	107.6199	104.6753	109.5673	112.7482	117.8851	123.1747	127.3855	(44)
Energy conte	187.6470	165.0073	173.3677	152.7046	145.3444	124.4589	115.6693	128.9627	130.7823	151.9069	166.4748	187.0749	(45)
Energy content (annual)										Total = Sum(45)m =		1829.4006	
Distribution loss (46)m = 0.15 x (45)m	28.1470	24.7511	26.0052	22.9057	21.8017	18.6688	17.3504	19.3444	19.6173	22.7860	24.9712	28.0612	(46)
Water storage loss (or HIU loss):													
Store volume													110.0000 (47)
b) If manufacturer declared loss factor is not known :													
Hot water storage loss factor from Table 2 (kWh/litre/day)													0.0152 (51)
Volume factor from Table 2a													1.0294 (52)
Temperature factor from Table 2b													0.6000 (53)
Enter (49) or (54) in (55)													1.0327 (55)
Total storage loss	32.0144	28.9162	32.0144	30.9817	32.0144	30.9817	32.0144	32.0144	30.9817	32.0144	30.9817	32.0144	(56)
If cylinder contains dedicated solar storage	32.0144	28.9162	32.0144	30.9817	32.0144	30.9817	32.0144	32.0144	30.9817	32.0144	30.9817	32.0144	(57)
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624	(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	242.9238	214.9347	228.6445	206.1983	200.6212	177.9525	170.9461	184.2395	184.2759	207.1837	219.9685	242.3517	(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	242.9238	214.9347	228.6445	206.1983	200.6212	177.9525	170.9461	184.2395	184.2759	207.1837	219.9685	242.3517	(64)
12Total per year (kWh/year)										Total per year (kWh/year) = Sum(64)m =		2480.2404	(64)
Electric shower(s)	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)
													0.0000 (64a)
Heat gains from water heating, kWh/month	106.6141	94.8069	101.8662	93.5692	92.5485	84.1775	82.6815	87.1015	86.2800	94.7305	98.1478	106.4238	(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	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	106.4966	117.9070	106.4966	110.0465	106.4966	110.0465	106.4966	106.4966	110.0465	106.4966	110.0465	106.4966	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	207.1851	209.3351	203.9173	192.3835	177.8242	164.1405	154.9990	152.8490	158.2668	169.8006	184.3599	198.0436	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	(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)	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	(71)
Water heating gains (Table 5)	143.2985	141.0816	136.9169	129.9573	124.3931	116.9132	111.1310	117.0720	119.8334	127.3259	136.3164	143.0428	(72)
Total internal gains	515.1778	526.5212	505.5284	490.5848	466.9114	449.2977	430.8241	434.6151	446.3442	461.8206	488.9203	505.7805	(73)

6. Solar gains

[Jan]	Area m2	Solar flux Table 6a	g Specific data	FF Specific data	Access factor	Gains W
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Electricity for lighting (calculated in Appendix L)	185.5845 (332)
Energy saving/generation technologies (Appendices M ,N and Q)	
PV generation	-159.1239 (333)
Wind generation	0.0000 (334)
Hydro-electric generation (Appendix N)	0.0000 (335a)
Electricity generated - Micro CHP (Appendix N)	0.0000 (335)
Appendix Q - special features	
Energy saved or generated	-0.0000 (336)
Energy used	0.0000 (337)
Total delivered energy for all uses	5703.6374 (338)

12b. Carbon dioxide emissions - Community heating scheme

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year
Efficiency of heat source Heat pump			232.0000 (367)
Space and Water heating from Heat pump	2363.6075	0.1572	119.4526 (367)
Electrical energy for heat distribution (space & water)	17.6321	0.0000	8.0105 (372)
Overall CO2 factor for heat network			0.0644 (386)
Total CO2 associated with community systems			353.2897 (373)
Space and water heating			353.2897 (376)
Pumps, fans and electric keep-hot	193.6074	0.1387	26.8557 (378)
Energy for lighting	185.5845	0.1443	26.7856 (379)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-159.1239	0.1305	-20.7719
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-20.7719 (380)
Total CO2, kg/year			386.1590 (383)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			5.2000 (384)

13b. Primary energy - Community heating scheme

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Efficiency of heat source Heat pump			232.0000 (467a)
Space and Water heating from Heat pump	2363.6075	1.5819	1202.2163 (467)
Electrical energy for heat distribution (space & water)	17.6321	0.0000	84.4674 (472)
Overall CO2 factor for heat network			0.6794 (486)
Total CO2 associated with community systems			3725.3046 (473)
Space and water heating			3725.3046 (476)
Pumps, fans and electric keep-hot	193.6074	1.5128	292.8892 (478)
Energy for lighting	185.5845	1.5338	284.6557 (479)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-159.1239	1.4822	-235.8557
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-235.8557 (480)
Total Primary energy kWh/year			4066.9938 (483)
Dwelling Primary energy Rate (DPER)			54.7200 (484)

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

1. Overall dwelling characteristics

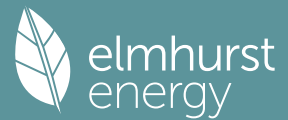
	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling			
Ground floor	74.3300 (1b)	x 2.8000 (2b)	= 208.1240 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	74.3300		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 208.1240 (5)

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)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	30.0000 / (5) = 0.1441 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	5.0000 (17)
Infiltration rate	0.3941 (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) = 0.3055 (21)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

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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												
Effective ac	0.3895	0.3818	0.3742	0.3360	0.3284	0.2902	0.2902	0.2826	0.3055	0.3284	0.3436	0.3589 (22b)
	0.5758	0.5729	0.5700	0.5565	0.5539	0.5421	0.5421	0.5399	0.5467	0.5539	0.5590	0.5644 (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			2.4200	1.0000	2.4200		(26)
TER Opening Type			13.5700	1.1450	15.5382		(27)
Heatloss Floor 1			74.3300	0.1300	9.6629		(28b)
External Wall 1	25.4400	13.5700	11.8700	0.1800	2.1366		(29a)
Corridor wall	60.8300	2.4200	58.4100	0.1800	10.5138		(29a)
Total net area of external elements Aum(A, m2)			160.6000				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	40.2715	(33)
Main dwelling							
Party Wall 1			13.6100	0.0000	0.0000		(32)

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

239.9647 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate	6.6700	0.0500	0.3335
E4 Jamb	19.2000	0.0500	0.9600
E7 Party floor between dwellings (in blocks of flats)	5.7300	0.0700	0.4011
E7 Party floor between dwellings (in blocks of flats)	21.7300	0.0700	1.5211
E9 Balcony between dwellings, wall insulation continuous	3.3600	0.0200	0.0672
E16 Corner (normal)	5.6000	0.0900	0.5040
E16 Corner (normal)	2.8000	0.0900	0.2520
E17 Corner (inverted - internal area greater than external area)	2.8000	-0.0900	-0.2520
E18 Party wall between dwellings	2.8000	0.0600	0.1680
E20 Exposed floor (normal)	9.0900	0.3200	2.9088
E21 Exposed floor (inverted)	21.7300	0.3200	6.9536
E25 Staggered party wall between dwellings	2.8000	0.0600	0.1680
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	4.8600	0.0000	0.0000
P7 Party Wall - Exposed floor (normal)	4.8600	0.1600	0.7776

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

14.7629 (36)

Point Thermal bridges

(36a) = 0.0000

Total fabric heat loss

(33) + (36) + (36a) = 55.0344 (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	39.5493	39.3470	39.1488	38.2176	38.0433	37.2323	37.2323	37.0821	37.5447	38.0433	38.3958	38.7643 (38)
Average = Sum(39)m / 12 =	94.5837	94.3814	94.1831	93.2519	93.0777	92.2666	92.2666	92.1164	92.5790	93.0777	93.4302	93.7986 (39)
												93.2511

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.2725	1.2698	1.2671	1.2546	1.2522	1.2413	1.2413	1.2393	1.2455	1.2522	1.2570	1.2619 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy													2.3465 (42)
Hot water usage for mixer showers	63.5628	62.6076	61.2156	58.5524	56.5870	54.3952	53.1493	54.5307	56.0450	58.3984	61.1188	63.3193 (42a)	
Hot water usage for baths	27.4573	27.0495	26.4753	25.4165	24.6237	23.7446	23.2697	23.8400	24.4608	25.4015	26.4821	27.3645 (42b)	
Hot water usage for other uses	38.6605	37.2547	35.8488	34.4430	33.0372	31.6313	31.6313	33.0372	34.4430	35.8488	37.2547	38.6605 (42c)	
Average daily hot water use (litres/day)												119.2059 (43)	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	129.6806	126.9118	123.5397	118.4119	114.2478	109.7711	108.0504	111.4079	114.9489	119.6487	124.8556	129.3442 (44)	
Energy content (annual)	205.3824	180.7207	189.8760	162.0999	153.7995	134.9763	130.6776	137.9462	141.7434	162.3622	177.8797	202.5218 (45)	
Distribution loss (46)m = 0.15 x (45)m	30.8074	27.1081	28.4814	24.3150	23.0699	20.2464	19.6016	20.6919	21.2615	24.3543	26.6820	30.3783 (46)	
Water storage loss (or HIU loss):													
Store volume												180.0000 (47)	
a) If manufacturer declared loss factor is known (kWh/day):												1.5520 (48)	
Temperature factor from Table 2b												0.5400 (49)	
Enter (49) or (54) in (55)												0.8381 (55)	
Total storage loss	25.9803	23.4661	25.9803	25.1422	25.9803	25.1422	25.9803	25.9803	25.1422	25.9803	25.1422	25.9803 (56)	
If cylinder contains dedicated solar storage	25.9803	23.4661	25.9803	25.1422	25.9803	25.1422	25.9803	25.9803	25.1422	25.9803	25.1422	25.9803 (57)	
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624 (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	254.6251	225.1979	239.1186	209.7541	203.0422	182.6305	179.9203	187.1889	189.3976	211.6048	225.5339	251.7645 (62)	
WWHRS	-29.0583	-25.6994	-26.9109	-22.2833	-20.7672	-17.7707	-16.6572	-17.7132	-18.3862	-21.6753	-24.5555	-28.5201 (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	225.5668	199.4986	212.2078	187.4708	182.2750	164.8599	163.2631	169.4757	171.0114	189.9295	200.9784	223.2444 (64)	
12Total per year (kWh/year)										Total per year (kWh/year) = Sum(64)m =		2289.7813 (64)	
Electric shower(s)	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)	
												0.0000 (64a)	
Heat gains from water heating, kWh/month	107.6838	95.6714	102.5279	92.0216	90.5325	83.0030	82.8444	85.2613	85.2531	93.3796	97.2683	106.7326 (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	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	106.4966	117.9070	106.4966	110.0465	106.4966	110.0465	106.4966	106.4966	110.0465	106.4966	110.0465	106.4966	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	207.1851	209.3351	203.9173	192.3835	177.8242	164.1405	154.9990	152.8490	158.2668	169.8006	184.3599	198.0436	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	(71)
Water heating gains (Table 5)	144.7363	142.3682	137.8063	127.8078	121.6834	115.2819	111.3500	114.5985	118.4070	125.5102	135.0949	143.4579	(72)
Total internal gains	519.6155	530.8078	509.4178	491.4353	467.2018	447.6665	431.0431	432.1416	444.9178	463.0048	490.6988	509.1956	(73)

6. Solar gains

[Jan]												
				Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c			Access factor Table 6d		Gains W

Southwest				13.5700	36.7938		0.6300	0.7000		0.7700		152.5902 (79)

Solar gains	152.5902	259.9176	355.6306	440.6435	493.5575	489.9883	472.4011	432.9249	385.0727	287.2643	182.7679	130.5854 (83)
Total gains	672.2058	790.7254	865.0484	932.0789	960.7593	937.6548	903.4442	865.0665	829.9905	750.2692	673.4667	639.7810 (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	52.3833	52.4956	52.6061	53.1314	53.2309	53.6988	53.6988	53.7863	53.5176	53.2309	53.0300	52.8217
alpha	4.4922	4.4997	4.5071	4.5421	4.5487	4.5799	4.5799	4.5858	4.5678	4.5487	4.5353	4.5214
util living area	0.9875	0.9739	0.9491	0.8882	0.7746	0.5994	0.4429	0.4802	0.6998	0.9067	0.9748	0.9898 (86)
MIT	19.6668	19.9083	20.2062	20.5611	20.8226	20.9583	20.9915	20.9878	20.9151	20.5796	20.0624	19.6251 (87)
Th 2	19.8625	19.8646	19.8667	19.8766	19.8784	19.8871	19.8871	19.8887	19.8838	19.8784	19.8747	19.8708 (88)
util rest of house	0.9837	0.9663	0.9340	0.8557	0.7136	0.5074	0.3342	0.3690	0.6113	0.8723	0.9661	0.9867 (89)
MIT 2	18.3479	18.6528	19.0233	19.4530	19.7367	19.8644	19.8845	19.8846	19.8310	19.4862	18.8575	18.3011 (90)
Living area fraction	fLA = Living area / (4) =											
MIT	18.9558	19.2315	19.5686	19.9637	20.2372	20.3686	20.3948	20.3931	20.3307	19.9902	19.4129	18.9113 (92)
Temperature adjustment	0.0000											
adjusted MIT	18.9558	19.2315	19.5686	19.9637	20.2372	20.3686	20.3948	20.3931	20.3307	19.9902	19.4129	18.9113 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9797	0.9609	0.9292	0.8585	0.7345	0.5485	0.3844	0.4203	0.6487	0.8763	0.9615	0.9832	(94)
Useful gains	658.5413	759.7740	803.8154	800.2293	705.6622	514.2857	347.3237	363.6056	538.3761	657.4274	647.5046	629.0058	(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	1386.1999	1352.6253	1230.8376	1031.7146	794.6205	532.2528	350.1296	367.8291	576.8313	874.0149	1150.3922	1379.9029	(97)
Space heating kWh	541.3780	398.3961	317.7046	166.6695	66.1850	0.0000	0.0000	0.0000	0.0000	161.1411	362.0791	558.6674	(98a)
Space heating requirement - total per year (kWh/year)												2572.2207	
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	(98b)
Space heating kWh	541.3780	398.3961	317.7046	166.6695	66.1850	0.0000	0.0000	0.0000	0.0000	161.1411	362.0791	558.6674	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												2572.2207	
Space heating per m2											(98c) / (4) =	34.6054	(99)

9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)												0.0000 (201)
Fraction of space heat from main system(s)												1.0000 (202)
Efficiency of main space heating system 1 (in %)												92.3000 (206)
Efficiency of main space heating system 2 (in %)												0.0000 (207)
Efficiency of secondary/supplementary heating system, %												0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	541.3780	398.3961	317.7046	166.6695	66.1850	0.0000	0.0000	0.0000	0.0000	161.1411	362.0791	558.6674 (98)
Space heating efficiency (main heating system 1)	92.3000	92.3000	92.3000	92.3000	92.3000	0.0000	0.0000	0.0000	0.0000	92.3000	92.3000	92.3000 (210)
Space heating fuel (main heating system)	586.5418	431.6317	344.2086	180.5736	71.7063	0.0000	0.0000	0.0000	0.0000	174.5840	392.2850	605.2735 (211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (215)
Water heating												
Water heating requirement	225.5668	199.4986	212.2078	187.4708	182.2750	164.8599	163.2631	169.4757	171.0114	189.9295	200.9784	223.2444 (64)
Efficiency of water heater (217)m	85.9490	85.5795	84.9627	83.7970	82.0142	79.8000	79.8000	79.8000	79.8000	83.6934	85.3636	79.8000 (216)
Fuel for water heating, kWh/month	262.4425	233.1149	249.7658	223.7201	222.2480	206.5913	204.5904	212.3755	214.3000	226.9348	235.4381	259.4966 (219)
Space cooling fuel requirement (221)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 (221)

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Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.3041	7.0685	7.3041	7.0685	7.3041	(231)
Lighting	22.1279	17.7518	15.9835	11.7102	9.0453	7.3901	8.2514	10.7255	13.9314	18.2788	20.6458	22.7429	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	-14.0536	-21.2576	-32.7553	-39.5650	-45.1094	-43.0076	-42.4841	-38.8799	-32.9804	-25.4720	-15.9543	-11.9877	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234a)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	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235a)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	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235c)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	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233b)m	-4.0854	-8.8590	-18.1161	-27.9765	-37.7605	-38.2269	-37.7785	-31.6318	-22.7247	-12.9154	-5.5314	-3.2113	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234b)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	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235b)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	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235d)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	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1												2786.8047	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												79.8000	
Water heating fuel used												2751.0181	(219)
Space cooling fuel												0.0000	(221)
Electricity for pumps and fans:													
Total electricity for the above, kWh/year												86.0000	(231)
Electricity for lighting (calculated in Appendix L)												178.5848	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation												-612.3244	(233)
Wind generation												0.0000	(234)
Hydro-electric generation (Appendix N)												0.0000	(235a)
Electricity generated - Micro CHP (Appendix N)												0.0000	(235)
Appendix Q - special features													
Energy saved or generated												-0.0000	(236)
Energy used												0.0000	(237)
Total delivered energy for all uses												5190.0831	(238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	2786.8047	0.2100	585.2290	(261)
Total CO2 associated with community systems			0.0000	(373)
Water heating (other fuel)	2751.0181	0.2100	577.7138	(264)
Space and water heating			1162.9428	(265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293	(267)
Energy for lighting	178.5848	0.1443	25.7753	(268)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-363.5069	0.1331	-48.3978	
PV Unit electricity exported	-248.8176	0.1251	-31.1247	
Total			-79.5225	(269)
Total CO2, kg/year			1121.1248	(272)
EPC Target Carbon Dioxide Emission Rate (TER)			15.0800	(273)

13a. Primary energy - Individual heating systems including micro-CHP

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year	
Space heating - main system 1	2786.8047	1.1300	3149.0893	(275)
Total CO2 associated with community systems			0.0000	(473)
Water heating (other fuel)	2751.0181	1.1300	3108.6504	(278)
Space and water heating			6257.7397	(279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008	(281)
Energy for lighting	178.5848	1.5338	273.9193	(282)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-363.5069	1.4920	-542.3470	
PV Unit electricity exported	-248.8176	0.4591	-114.2392	
Total			-656.5862	(283)
Total Primary energy kWh/year			6005.1735	(286)
Target Primary Energy Rate (TPER)			80.7900	(287)

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Plot Reference	A 114			Issued on Date	15/05/2026
Assessment Reference	Be Green 250516	Plot Type Ref			
Plot Address				SAP Version	10.2
SAP Rating	82 B	DER	5.20	TER	15.08
Environmental	96 A	% DER < TER			65.52
CO ₂ Emissions (t/year)	0.34	DFEE	37.95	TFEE	41.95
Compliance Check	See BREL	% DFEE < TFEE			9.55
% DPER < TPER	32.27	DPER	54.72	TPER	80.79
Assessor Details	Mr. Robert Tanner			Assessor ID	W344-0001
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)	74.3300		208.1240 (1b) - (3b)
Dwelling volume			208.1240 (4)

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) =	0.1441 (8)
Pressure test	Yes	
Pressure Test Method	Blower Door	
Measured/design AP50		3.0000 (17)
Infiltration rate		0.2941 (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) =	0.2280 (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	0.2907	0.2850	0.2793	0.2508	0.2451	0.2166	0.2166	0.2109	0.2280	0.2451	0.2565	0.2679 (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	0.5422	0.5406	0.5390	0.5314	0.5300	0.5235	0.5235	0.5222	0.5260	0.5300	0.5329	0.5359 (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							
Door			2.4200	1.0000	2.4200		(26)
Windows			13.5700	1.1450	15.5382		(27)
Heatloss Floor 1			74.3300	0.1000	7.4330	110.0000	8176.3000 (28b)
External Wall 1	25.4400	13.5700	11.8700	0.1500	1.7805	70.0000	830.9000 (29a)
Corridor wall	60.8300	2.4200	58.4100	0.1900	11.0979	70.0000	4088.7000 (29a)
Total net area of external elements Aum(A, m ²)			160.6000				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	38.2696	(33)
Main dwelling							
Party Wall 1			13.6100	0.0000	0.0000	70.0000	952.7000 (32)
Party Ceiling 1			74.3300			30.0000	2229.9000 (32b)
Internal Wall 1			173.1200			9.0000	1558.0800 (32c)

Heat capacity Cm = Sum(A x k)	(28)...(30) + (32) + (32a)...(32e) =	17836.5800 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K		239.9647 (35)

List of Thermal Bridges	Length	Psi-value	Total
K1 Element			
E1 Steel lintel with perforated steel base plate	6.6700	0.0500	0.3335
E4 Jamb	19.2000	0.0400	0.7680

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E7 Party floor between dwellings (in blocks of flats)	5.7300	0.0500	0.2865
E7 Party floor between dwellings (in blocks of flats)	21.7300	0.0390	0.8475
E9 Balcony between dwellings, wall insulation continuous	3.3600	0.0500	0.1680
E16 Corner (normal)	5.6000	0.0500	0.2800
E16 Corner (normal)	2.8000	0.0390	0.1092
E17 Corner (inverted - internal area greater than external area)	2.8000	0.0000	0.0000
E18 Party wall between dwellings	2.8000	0.0390	0.1092
E20 Exposed floor (normal)	9.0900	0.1000	0.9090
E21 Exposed floor (inverted)	21.7300	0.1000	2.1730
E25 Staggered party wall between dwellings	2.8000	0.0390	0.1092
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	4.8600	0.0000	0.0000
P7 Party Wall - Exposed floor (normal)	4.8600	0.0800	0.3888

Thermal bridges (Sum(L x Psi) calculated using Appendix K) 6.4819 (36)
 Point Thermal bridges (36a) = 0.0000
 Total fabric heat loss (33) + (36) + (36a) = 44.7514 (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	37.2415	37.1288	37.0184	36.4998	36.4027	35.9510	35.9510	35.8674	36.1250	36.4027	36.5990	36.8043 (38)
Average = Sum(39)m / 12 =	81.9929	81.8803	81.7699	81.2512	81.1542	80.7025	80.7025	80.6188	80.8765	81.1542	81.3505	81.5557 (39)
												81.2508

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.1031	1.1016	1.1001	1.0931	1.0918	1.0857	1.0857	1.0846	1.0881	1.0918	1.0945	1.0972 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy	2.3465 (42)											
Hot water usage for mixer showers	0.0000 (42a)											
Hot water usage for baths	26.8452	26.4400	25.8635	25.0001	24.2220	23.1509	22.3383	23.3320	23.8535	24.9148	26.0182	26.8239 (42b)
Hot water usage for other uses	38.6605	37.2547	35.8488	34.4430	33.0372	31.6313	31.6313	33.0372	34.4430	35.8488	37.2547	38.6605 (42c)
Average daily hot water use (litres/day)	60.0378 (43)											
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	65.5057	63.6947	61.7123	59.4431	57.2592	54.7823	53.9697	56.3692	58.2965	60.7636	63.2729	65.4844 (44)
Energy content (annual)	96.4358	84.2809	88.1856	77.6476	73.7843	63.3539	59.6381	66.3476	67.6210	78.3001	85.5155	96.1687 (45)
Distribution loss (46)m = 0.15 x (45)m	Total = Sum(45)m = 937.2789											
Water storage loss (or HIU loss):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (46)
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
If cylinder contains dedicated solar storage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (61)
Total heat required for water heating calculated for each month	81.9704	71.6388	74.9578	66.0004	62.7166	53.8508	50.6924	56.3954	57.4779	66.5551	72.6881	81.7434 (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	81.9704	71.6388	74.9578	66.0004	62.7166	53.8508	50.6924	56.3954	57.4779	66.5551	72.6881	81.7434 (64)
12Total per year (kWh/year)	Total per year (kWh/year) = Sum(64)m = 796.6871 (64)											
Electric shower(s)	50.9032	45.3552	49.5261	47.2622	48.1490	45.9295	47.4605	48.1490	47.2622	49.5261	48.5948	50.9032 (64a)
Heat gains from water heating, kWh/month	33.2184	29.2485	31.1210	28.3156	27.7164	24.9451	24.5382	26.1361	26.1850	29.0203	30.3207	33.1616 (65)

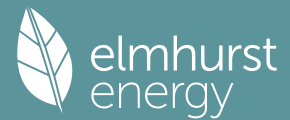
5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	106.4966	117.9070	106.4966	110.0465	106.4966	110.0465	106.4966	106.4966	110.0465	106.4966	110.0465	106.4966 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	207.1851	209.3351	203.9173	192.3835	177.8242	164.1405	154.9990	152.8490	158.2668	169.8006	184.3599	198.0436 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325 (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)	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601 (71)
Water heating gains (Table 5)	44.6484	43.5245	41.8293	39.3273	37.2532	34.6459	32.9815	35.1292	36.3681	39.0058	42.1121	44.5721 (72)
Total internal gains	416.5277	428.9641	410.4407	399.9549	379.7716	367.0305	352.6745	352.6723	362.8789	373.5005	394.7160	407.3098 (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	
Southwest	13.5700	36.7938	0.3500	0.7000	0.7700	84.7723 (79)
Solar gains	84.7723	144.3987	197.5725	244.8020	274.1986	272.2157
Total gains	501.3000	573.3628	608.0133	644.7568	653.9702	639.2462
						615.1196
						240.5138
						213.9293
						159.5913
						101.5377
						72.5475 (83)
						479.8573 (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	60.4272	60.5104	60.5921	60.9788	61.0518	61.3935	61.3935	61.4572	61.2614	61.0518	60.9044	60.7512
alpha	5.0285	5.0340	5.0395	5.0653	5.0701	5.0929	5.0929	5.0971	5.0841	5.0701	5.0603	5.0501
util living area	0.9959	0.9914	0.9829	0.9560	0.8889	0.7360	0.5619	0.6025	0.8215	0.9618	0.9912	0.9967 (86)
MIT	19.6926	19.8729	20.1158	20.4478	20.7388	20.9306	20.9857	20.9797	20.8731	20.5011	20.0384	19.6583 (87)
Th 2	19.9983	19.9995	20.0008	20.0065	20.0075	20.0125	20.0125	20.0134	20.0106	20.0075	20.0054	20.0031 (88)
util rest of house	0.9947	0.9887	0.9771	0.9402	0.8477	0.6488	0.4436	0.4843	0.7486	0.9449	0.9880	0.9957 (89)
MIT 2	18.8134	18.9932	19.2342	19.5605	19.8271	19.9792	20.0086	20.0074	19.9409	19.6164	19.1631	18.7830 (90)
Living area fraction	fLA = Living area / (4) =											0.4609 (91)
MIT	19.2186	19.3987	19.6405	19.9695	20.2473	20.4177	20.4590	20.4556	20.3706	20.0242	19.5666	19.1865 (92)
Temperature adjustment												0.0000
adjusted MIT	19.2186	19.3987	19.6405	19.9695	20.2473	20.4177	20.4590	20.4556	20.3706	20.0242	19.5666	19.1865 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9933	0.9866	0.9746	0.9395	0.8588	0.6867	0.4984	0.5390	0.7776	0.9453	0.9861	0.9946 (94)
Useful gains	497.9502	565.6678	592.5434	605.7602	561.6584	438.9528	306.5516	319.7168	448.5163	503.9207	489.3535	477.2538 (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	1223.2231	1187.1557	1074.5001	899.4088	693.6513	469.5057	311.4302	326.9537	507.1415	764.8120	1014.1602	1222.2315 (97)
Space heating kWh	539.6030	417.6399	358.5758	211.4270	98.2027	0.0000	0.0000	0.0000	0.0000	194.1031	377.8609	554.2634 (98a)
Space heating requirement - total per year (kWh/year)												2751.6758
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	539.6030	417.6399	358.5758	211.4270	98.2027	0.0000	0.0000	0.0000	0.0000	194.1031	377.8609	554.2634 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												2751.6758
Space heating per m2												(98c) / (4) = 37.0197 (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	758.6032	597.1983	612.7030	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8041	0.8848	0.8630	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	609.9956	528.3850	528.7918	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	705.4796	679.5011	655.8250	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh												
	0.0000	0.0000	0.0000	0.0000	0.0000	68.7485	112.4303	94.5127	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	17.1871	28.1076	23.6282	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												68.9229 (107)
Energy for space heating												37.0197 (99)
Energy for space cooling												0.9273 (108)
Total												37.9470 (109)
Fabric Energy Efficiency (DFEE)												37.9 (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	74.3300 (1b)	x 2.8000 (2b)	= 208.1240 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	74.3300		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	208.1240 (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) = 0.1441 (8)
Pressure test Yes
Pressure Test Method Blower Door
Measured/design AP50 5.0000 (17)
Infiltration rate 0.3941 (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) = 0.3055 (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	0.3895	0.3818	0.3742	0.3360	0.3284	0.2902	0.2902	0.2826	0.3055	0.3284	0.3436	0.3589 (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	0.5758	0.5729	0.5700	0.5565	0.5539	0.5421	0.5421	0.5399	0.5467	0.5539	0.5590	0.5644 (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			2.4200	1.0000	2.4200		(26)
TER Opening Type			13.5700	1.1450	15.5382		(27)
Heatloss Floor 1			74.3300	0.1300	9.6629		(28b)
External Wall 1	25.4400	13.5700	11.8700	0.1800	2.1366		(29a)
Corridor wall	60.8300	2.4200	58.4100	0.1800	10.5138		(29a)
Total net area of external elements Aum(A, m2)			160.6000				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 40.2715		(33)
Main dwelling							
Party Wall 1			13.6100	0.0000	0.0000		(32)

Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K 239.9647 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate	6.6700	0.0500	0.3335
E4 Jamb	19.2000	0.0500	0.9600
E7 Party floor between dwellings (in blocks of flats)	5.7300	0.0700	0.4011
E7 Party floor between dwellings (in blocks of flats)	21.7300	0.0700	1.5211
E9 Balcony between dwellings, wall insulation continuous	3.3600	0.0200	0.0672
E16 Corner (normal)	5.6000	0.0900	0.5040
E16 Corner (normal)	2.8000	0.0900	0.2520
E17 Corner (inverted - internal area greater than external area)	2.8000	-0.0900	-0.2520
E18 Party wall between dwellings	2.8000	0.0600	0.1680
E20 Exposed floor (normal)	9.0900	0.3200	2.9088
E21 Exposed floor (inverted)	21.7300	0.3200	6.9536
E25 Staggered party wall between dwellings	2.8000	0.0600	0.1680
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	4.8600	0.0000	0.0000
P7 Party Wall - Exposed floor (normal)	4.8600	0.1600	0.7776

Thermal bridges (Sum(L x Psi) calculated using Appendix K) 14.7629 (36)
Point Thermal bridges (36a) = 0.0000
Total fabric heat loss (33) + (36) + (36a) = 55.0344 (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	39.5493	39.3470	39.1488	38.2176	38.0433	37.2323	37.2323	37.0821	37.5447	38.0433	38.3958	38.7643 (38)
Heat transfer coeff	94.5837	94.3814	94.1831	93.2519	93.0777	92.2666	92.2666	92.1164	92.5790	93.0777	93.4302	93.7986 (39)
Average = Sum(39)m / 12 =												93.2511

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.2725	1.2698	1.2671	1.2546	1.2522	1.2413	1.2413	1.2393	1.2455	1.2522	1.2570	1.2619 (40)
HLP (average)												1.2546
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.3465 (42)
Hot water usage for mixer showers												0.0000 (42a)
Hot water usage for baths												27.4573 (42b)
Hot water usage for other uses												38.6605 (42c)
Average daily hot water use (litres/day)												60.6032 (43)
Daily hot water use												
Energy conte	66.1178	64.3042	62.3241	59.8595	57.6609	55.3759	54.9011	56.8771	58.9038	61.2503	63.7368	66.0250 (44)
Energy content (annual)	104.7145	91.5683	95.7899	81.9447	77.6226	68.0911	66.3981	70.4258	72.6343	83.1161	90.8047	103.3792 (45)
Distribution loss (46)m = 0.15 x (45)m												1006.4892
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												
WWHRS	89.0073	77.8331	81.4214	69.6530	65.9792	57.8775	56.4384	59.8619	61.7392	70.6487	77.1840	87.8723 (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 (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 (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 (63c)
Output from w/h	89.0073	77.8331	81.4214	69.6530	65.9792	57.8775	56.4384	59.8619	61.7392	70.6487	77.1840	87.8723 (64)
12Total per year (kWh/year)												855.5158 (64)
Electric shower(s)												856 (64)

Full SAP Calculation Printout



	50.9032	45.3552	49.5261	47.2622	48.1490	45.9295	47.4605	48.1490	47.2622	49.5261	48.5948	50.9032 (64a)
	Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =											579.0209 (64a)
Heat gains from water heating, kWh/month	34.9776	30.7971	32.7369	29.2288	28.5321	25.9517	25.9747	27.0027	27.2503	30.0437	31.4447	34.6939 (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	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251	117.3251 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	106.4966	117.9070	106.4966	110.0465	106.4966	110.0465	106.4966	106.4966	110.0465	106.4966	110.0465	106.4966 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	207.1851	209.3351	203.9173	192.3835	177.8242	164.1405	154.9990	152.8490	158.2668	169.8006	184.3599	198.0436 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325	34.7325 (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)	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601	-93.8601 (71)
Water heating gains (Table 5)	47.0129	45.8290	44.0012	40.5955	38.3495	36.0441	34.9122	36.2940	37.8477	40.3813	43.6732	46.6316 (72)
Total internal gains	418.8922	431.2685	412.6126	401.2231	380.8679	368.4286	354.6053	353.8371	364.3585	374.8760	396.2771	409.3693 (73)

6. Solar gains

[Jan]														
	Area m2				Solar flux Table 6a W/m2		g Specific data or Table 6b		FF Specific data or Table 6c		Access factor Table 6d		Gains W	
Southwest	13.5700				36.7938		0.6300		0.7000		0.7700		152.5902 (79)	
Solar gains	152.5902	259.9176	355.6306	440.6435	493.5575	489.9883	472.4011	432.9249	385.0727	287.2643	182.7679	130.5854	(83)	
Total gains	571.4824	691.1861	768.2432	841.8666	874.4254	858.4170	827.0064	786.7620	749.4312	662.1403	579.0450	539.9547	(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)												21.0000 (85)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	52.3833	52.4956	52.6061	53.1314	53.2309	53.6988	53.6988	53.7863	53.5176	53.2309	53.0300	52.8217
alpha	4.4922	4.4997	4.5071	4.5421	4.5487	4.5799	4.5799	4.5858	4.5678	4.5487	4.5353	4.5214
util living area	0.9933	0.9840	0.9658	0.9164	0.8156	0.6437	0.4811	0.5236	0.7494	0.9361	0.9856	0.9948 (86)
MIT	19.5268	19.7773	20.0911	20.4787	20.7772	20.9445	20.9881	20.9827	20.8871	20.4912	19.9371	19.4849 (87)
Th 2	19.8625	19.8646	19.8667	19.8766	19.8784	19.8871	19.8871	19.8887	19.8838	19.8784	19.8747	19.8708 (88)
util rest of house	0.9912	0.9791	0.9550	0.8895	0.7588	0.5490	0.3644	0.4045	0.6626	0.9096	0.9803	0.9931 (89)
MIT 2	18.5442	18.7930	19.1012	19.4753	19.7356	19.8629	19.8842	19.8841	19.8268	19.4966	18.9608	18.5088 (90)
Living area fraction									fLA = Living area / (4) =			0.4609 (91)
MIT	18.9971	19.2467	19.5575	19.9378	20.2157	20.3614	20.3930	20.3904	20.3155	19.9550	19.4108	18.9587 (92)
Temperature adjustment												0.0000
adjusted MIT	18.9971	19.2467	19.5575	19.9378	20.2157	20.3614	20.3930	20.3904	20.3155	19.9550	19.4108	18.9587 (93)

8. Space heating requirement

Utilisation	0.9891	0.9756	0.9513	0.8912	0.7773	0.5911	0.4184	0.4595	0.6986	0.9118	0.9774	0.9913 (94)
Useful gains	565.2286	674.3529	730.8519	750.2833	679.7290	507.3731	346.0074	361.5233	523.5436	603.7163	565.9617	535.2633 (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	1390.1043	1354.0636	1229.7931	1029.2953	792.6233	531.5856	349.9718	367.5854	575.4274	870.7414	1150.2017	1384.3466 (97)
Space heating kWh	613.7075	456.7656	371.2123	200.8886	83.9933	0.0000	0.0000	0.0000	0.0000	198.6667	420.6529	631.7179 (98a)
Space heating requirement - total per year (kWh/year)												2977.6049
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	613.7075	456.7656	371.2123	200.8886	83.9933	0.0000	0.0000	0.0000	0.0000	198.6667	420.6529	631.7179 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												2977.6049
Space heating per m2										(98c) / (4) =		40.0593 (99)

8c. Space cooling requirement

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

Ext. temp.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	867.3063	682.7731	700.0849	0.0000	0.0000	0.0000	0.0000 (100)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.8603	0.9206	0.9013	0.0000	0.0000	0.0000	0.0000 (101)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	746.1565	628.5734	630.9877	0.0000	0.0000	0.0000	0.0000 (102)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	961.4171	926.8350	881.8858	0.0000	0.0000	0.0000	0.0000 (103)
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	38.7469	55.4767	46.6670	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												140.8906 (107)
Energy for space heating												40.0593 (99)
Energy for space cooling												1.8955 (108)

Total
Fabric Energy Efficiency (TFEE)

41.9547 (109)
42.0 (109)